PROGRAM & ABSTRACTS

WHAT'S YOUR STORY?

The Power of Collaborations and Connections

MINNEAPOLIS, MINNESOTA 2025

AIC'S 53rd ANNUAL MEETING

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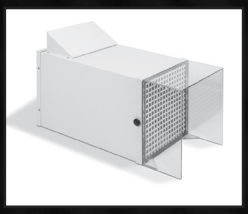

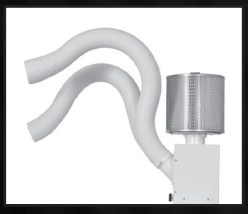

Milwaukee Art Museum

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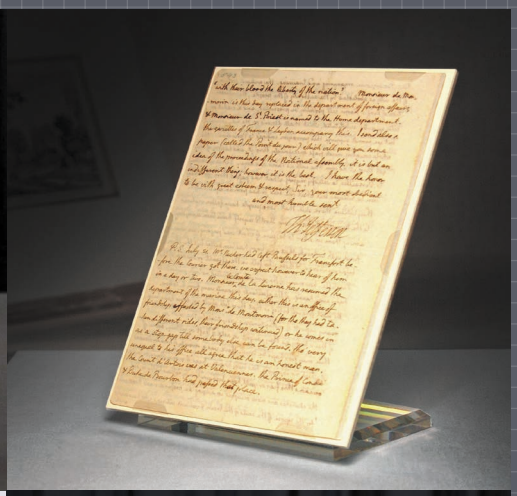

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NEED TO KNOW

Code of Conduct: See page 12 or read online at https://www.culturalheritage.org/events/code-of-conduct.

Registration Desk: Registration will be on the first floor of the Hyatt Regency Minneapolis. We only accept credit/debit cards (Visa, MasterCard, AmEx, Discover) in US dollars, no cash or check. See Attendee Information at https://www.culturalheritage.org/attendees.

Registration opens Tuesday at 9:30am and all other mornings at 7:45am. Tickets can be purchased at www.culturalheritage.org/addtickets 24/7 during the meeting. Please pick up any tickets purchased online at the registration desk. Your tickets are listed on the back of your namebadge.

Bulletin Boards: Check the bulletin boards near the registration area for program changes, messages, job listings, and other community announcements. Look for the literature showcase!

Online Meeting Community: Check your inbox each morning or visit our 2025 Annual Meeting Community for notes from attendees.

Speaker Ready Room: Hiawatha Room (Open 8:30am to 5:30pm)
Lactation Room: Hennepin Room (Open 7:00am to 9:00pm)
Quiet Room: Walker Room (Open 7:00am to 9:00pm)

Refreshment Breaks: Refreshments will be served in the **Exhibit Hall** at tduring the general and specialty sessions on Thursday and Friday, plus a preview event Wednesday evening:

Member Business Meeting: Nicollet B-D, Saturday, 4:00pm.

LAND ACKNOWLEDGEMENT

We are gathered in the state of Minnesota and city of Minneapolis. Minnesota comes from the Dakota phrase "Mni Sóta Makoce" roughly meaning 'the land where the waters reflect the sky.' The Dakhóta Oyáte (Dakota People) are the original stewards of the beautiful land and waterways of Minneapolis, which was unjustly ceded by the Treaties of 1837 & 1851. The Dakota and numerous other Indigenous peoples, whose cultural, spiritual, and economic practices are intrinsically woven to this landscape, hold this land sacred.

We take this time to recognize them, to honor their past, present and future members as the traditional stewards of this land where we meet today. We acknowledge the past injustices they were subject to, including genocide and forced relocation, and the present inequities against which they struggle today. We also celebrate their ongoing initiatives such as those by two native-led organizations, the Wakan Tipi Awanyankapi and the Owámniyomni Okhódayapi, who work to transform local waterways of Minneapolis back into places of healing, education, and connection. As individuals and as an organization we must continue to work to support such endeavors, practice restorative justice, hold space for other peoples and communities, and recognize the importance of inclusion, respect and equity.

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Welcome to AIC's 2025 Annual Meeting!

Suzanne Davis
AIC President

Welcome to AIC's 2025 Annual Meeting! Whether you are attending in person or online, we have a wonderful program in store.

This year's meeting centers on the narratives of individuals and communities, emphasizing the strength found in connection and collaboration. Fresh out of graduate school at age 26, I never imagined my career highlights wouldn't be the objects or sites I conserved, but the people I collaborated with to do it. Now, 25+ years later, my colleagues and community partners are what I value most. I hope this meeting brings you many opportunities to connect, share, and learn from stories of collaboration and community.

Of course, we can always improve the technical skills we need to do our hands-on work, too! As usual, you can expect many talks focused on new treatment approaches, research outcomes, and the care of collections large, small, and site-based.

AIC last met in Minneapolis in 2005, and the city has changed a lot in the past two decades. If you're attending in person, I hope you will enjoy discovering this vibrant place anew. Maybe, like me, this is your first time here. I invite you to join me in using our local guide to explore the city, especially if you'd like to support LGBTQ+ and BIPOC owned businesses.

If you're attending the AIC conference for the very first time, we have some useful tips that will help you navigate and make the most of your conference experience. And, if you'd like to brush up on your networking skills or maybe just enjoy your in-person conference interactions more, our Member Engagement Subcommittee has a lovely one-page resource for you.

This conference is a true testament to the collaborative effort and community spirit of hundreds of volunteers—our session chairs, speakers, local advisors—and the dedicated FAIC and AIC staff. Please join me in acknowledging their hard work by thanking them personally whenever possible.

I'm delighted to welcome you to AIC's 53rd Annual Meeting. Whether you're a first-time attendee or a seasoned AIC conference veteran, I hope you will leave this conference feeling inspired, more knowledgeable, and connected to others. ■

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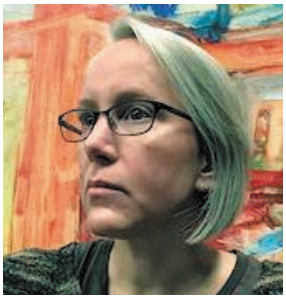

Corina Rogge
AIC Vice President

This annual meeting in Minneapolis is organized around the theme "What's Your Story? The Power of Collaborations and Connections," and for me this meeting's story is bittersweet, as it will be the last one that I'll have helped organize as AIC's Vice-President. The meetings in Los Angeles, Jacksonville, Salt Lake City, and Minneapolis have been unique in their own ways—with some definitely being more challenging than others—but all have presented me with amazing opportunities, and it has been an honor to help craft them. It's been such a privilege to work with all of the members of the General Session and Poster Selection Committees over the past four years. I have such respect for their knowledge, professionalism, and willingness to volunteer their time to help craft the meetings' scholarly programs. To all of those who have spoken at the past meetings, or who will speak at this one—I also owe you an immense debt of gratitude. Your generosity in sharing your projects is what lifts the field and keeps it growing; there were talks at these meetings that I will remember all of my life for the impact they made on me. The meetings have brought me happiness; there is nothing like hearing the excited exclamations as old friends see each other across the exhibit hall or in the corridors. These meetings have also been humbling; I continually marvel at the time and energy the FAIC and AIC staff put into them, particularly Ruth Seyler. Her commitment to trying to ensure the best possible experience for everyone is unwavering and very much appreciated. Thank you all.

So I hope that you enjoy this, the last meeting that I'll have helped organize. Minneapolis is a beautiful and storied city, and we had the highest ever number of abstract submissions so the array of talks is truly incredible. Look over the program and as you choose which talks to attend, rest assured that although you won't be able to attend all of them live, the recordings for the rest will be available—you won't have to miss anything! Take advantage of the workshops, pre-sessions, lunch programs, specialty group and network dinners, and tours. Meet new people by participating in the member engagement committee's "dance card" contest or just by saying "hi" in the coffee line. Compliment speakers and poster presenters; everyone likes to hear that others appreciate their work. Say thank you to the staff, program chairs, and selection committee members. Be excellent to each other—and I hope you'll all join me at the RATS afterparty on Friday, May 30th, at Roxy's Cabaret for one last hurrah! ■

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Funerary papri on display in *The Tomb* exhibition. © of National Museums Scotland.

Edvard Munch, *The Scream*. Tempera and oil on paper, 1910. © Munchmuseet. (Photo: WERNER MURRER RAHMEN)

Installation view, *Arts of Korea*, Brooklyn Museum, on view beginning September 15, 2017. (Photo: Brooklyn Museum)

The restored Chinese screen in the Dining Cove at Taliesin West. Photo by Andrew Pielage. Courtesy the Frank Lloyd Wright Foundation. Scottsdale, AZ

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PEOPLE

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2025 Program Committees

Thank you to the program committees, whose work is reflected in the 300 sessions at this year's meeting!

General Session Program Committee: Vanessa Appelbaum, Megan Brakob Narvey, JP Brown, Annabelle Camp, Al Carver-Kubik, Marie Desrochers, Lisa Goldberg, Alessandra Guarascio, Dr. Abed Haddad, Shannon Kimbro, Shan Kuang, Emily Hamilton, Susan Heald, Elizabeth Holford, Sara Leonowitz, Dianne Modestini, Adam Neese, Dr. Corina Rogge*, Ruth Seyler**, Dr. E. Keats Webb

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Architecture: Alexandra "Ali" Wysopal (Program Chair) and Tania Alam (Assistant Program Chair)

Book and Paper: Morgan Adams (Program Chair), Anita Dey (Assistant Program Chair)

Conservators in Private Practice: Linnaea E. Saunders (Program Chair), Johanna Pinney (Assistant Program Chair)

Contemporary Art Network: Ellen Moody (Program Chair)

Electronic Media: Caroline Gil Rodríguez (Program Chair), Elisse Brautigam (Assistant Program Chair)

Objects: Caroline I. Roberts (Program Chair), Sarah Montonchaikul (Assistant Program Chair)

Paintings: Sydney B. Nikolaus (Program Chair), Magdalena Solano (Assistant Program Chair)

Photographic Materials: Sarah Casto (Program Chair), Laura Wahl (Assistant Program Chair)

Preventive Care Network: Lisa Goldberg (Program Chair)

Research and Technical Studies: Mina Porell (Program Chair), Dr. Annette S. Ortiz Miranda (Assistant Program Chair)

Textiles: Callie O'Connor (Program Chair)

Wooden Artifacts: Caroline E. Shaver (Program Chair), Elly Stewart Davis (Assistant Program Chair)

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Communications & Membership Director: Bonnie Naugle

Education Manager: Sarah Saetren (on parental leave), Nikkie Markle (interim)

Meetings & Advocacy Director: Ruth Seyler

Membership Manager: Ryan Winfield

Stop by the registration desk or Booth #105 in the Exhibit Hall to say hi to staff!

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Museum Display Cases
and Exhibition Fabrication

2025 Annual Meeting Theme

What's Your Story? The Power of Collaborations and Connections

Objects and sites have stories to tell about people—the people who made them, who used them, who loved them, and who preserved them. Our field can help tell parts of those stories, but the full history and meaning of an object, site or building can often only be told through collaborations with others. The artist/maker, Elders, Knowledge Keepers and source communities know the intent behind the act of creation and the emotional value and meaning of an object or location in a way we never may. Their insights into whether and how something should be studied, displayed, and preserved should inform our work.

Collaborations with colleagues in different fields that use new techniques or that bring specialized knowledge to bear may bring insights we might not be otherwise able to glean by ourselves, or lead to the development of new treatment or analytical methodologies. Our telling the stories about what we have learned may inspire others to enter the preservation field, build bridges to neglected communities, or perhaps the way an institution operates. We are all stronger when we are together, none of us operate in a vacuum, so this year we want to hear your story about the power of working with others.

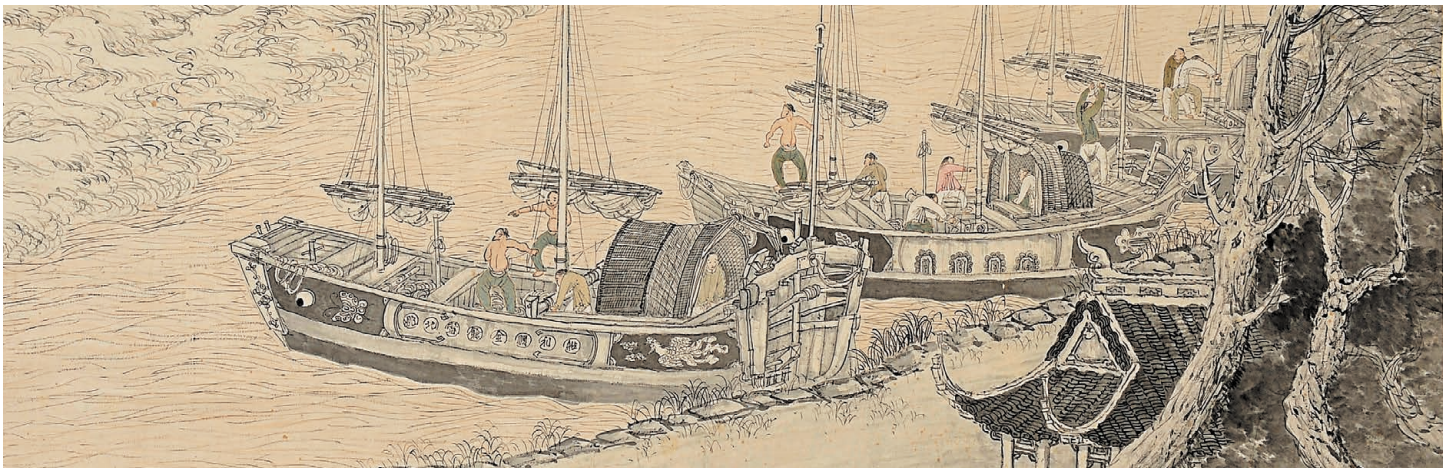
Code of Conduct

AIC and FAIC are dedicated to providing a positive experience for everyone participating in a conference, workshop, or other event, regardless of age, profession, professional experience, race, religion, gender, sexual orientation, gender identity and expression, disability, and physical appearance. Embracing diversity and promotion of an inclusive environment and accessible opportunities are central to our organizations' mission and values.

We expect event participants to maintain a cordial tone and respectful attitude during any and all exchanges. Listen with an open mind when others are speaking, be respectful of differing viewpoints and experiences, and if you have a dissenting opinion about a topic under discussion, express it in a polite, non-confrontational, and professional manner. Personal attacks or slurs towards other attendees, organizational staff, host and/or venue staff, or anyone connected to the event or venue will not be tolerated, nor will any form of mistreatment, including abusive, harassing, or threatening language or behavior.

We strive for a culture that openly addresses and works collectively to resolve any behavior that may violate the code of conduct. If you feel secure doing so, you may speak up immediately if something makes you or other attendees uncomfortable. If you feel you have experienced or witnessed behavior that violates this code of conduct, please report the incident as soon as possible. Reports can be made at the registration desk, in person to an F/AIC staff member, or by emailing an AIC or FAIC staff member (AIC Annual Meeting: rseyler@culturalheritage.org, FAIC events: Deputy Director Tiffani Emig at temig@culturalheritage.org). At all times, we will protect your confidentiality.

If a participant engages in behavior that violates this code of conduct, we may take any action we deem appropriate, which at minimum will involve warning the offender and explaining to them why their behavior is unacceptable and cannot continue, but may include their expulsion from a session, event, or entire meeting with no refund. AIC members, who have agreed to abide by the organization's Code of Ethics, may be reported to the Ethics and Standards Committee to determine if their conduct has violated said code.



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Unknown artist
Zun (wine vessel), thirteenth–twelfth century BCE
Minneapolis Institute of Art
Art Conservation Project 2025 Selection

Pierre-Auguste Renoir (French, 1841–1919)
The Henriot Family (*La Famille Henriot*), c. 1875 (detail)
The Barnes Foundation, Philadelphia
Art Conservation Project 2025 Selection

Top:
Komuro Suiun (Japanese, 1874–1945)
Watching the Tidal Bore, 1922 (detail)
Yamatane Museum of Art, Tokyo
Art Conservation Project 2025 Selection

JOIN A LOCAL TOUR

TUESDAY

1:30pm - 4:00pm Walking Tour of Owamniyomni Falls (formerly known as St. Anthony Falls) - $29

The Owámniyomni Okhódayapi organization will lead this tour of the Falls and the Upper Lock. Along the way you will learn about the Dakota lifeways, the significance of the River, and the Mní Sóta Dakota Tribes' vision for cultural and environmental restoration. 100% of this fee goes to support the Owámniyomni Okhódayap organization. This tour repeats on Wednesday.

1:30pm - 4:30pm Minnesota Historical Society Conservation Labs - $25

A behind-the-scenes tour of the MSHS conservation labs, with two different tour options, a tour of the Book & Paper Conservation Lab, State Archives, and the Library OR a tour with an object and textile focus, touring through 3D storage and the Objects Conservation Lab.

2:00pm - 4:00pm Purcell-Cutts House Tour - $39

The Purcell-Cutts House, designed and built by William Gray Purcell and George Grant Elmslie, is a masterpiece of Prairie School architecture.

4:00pm - 6:00pm Conservation at Work: Tour of the Basilica of Saint Mary led by Kelly Caldwell and Mary Slater - $20

EverGreene Architectural Arts is in the process of a multi-fascinated restoration of the Basilica of Saint Mary in Minneapolis. Take a behind the scenes tour of the building with the conservation professionals involved in the project.

4:00pm - 6:00pm Traditional Stone Lithography Demonstration at C&C Editions (FULL)

WEDNESDAY

9:00am - 3:30pm Tru Vue Behind the Scenes (FULL)

9:00am - 12:00pm Walking Tour of Owamniyomni Falls (formerly known as St. Anthony Falls) - $29

9:00am - 4:00pm "Lab & Learn" with the Science Museum of Minnesota (FULL)

9:30am - 4:00pm Twin Cities Gilded Age and Victorian Architectural Gems - $85

This tour includes two historic home tours and a walking tour. Explore the James J. Hill House and Alexander Ramsey House from a conservation perspective and explore Summit Avenue, home to the longest stretch of Victorian mansions remaining in the country, with an expert-led walking tour.

10:00am - 12:00pm Intaglio /Copper Etching Plate Printing Demonstration at C&C Editions (FULL)

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EVENING EVENTS

Wednesday, May 28

Keynotes, Awards Ceremony (4:00-6:30pm), Exhibit Hall Reception (6:30-8:30pm)

Start the conference off by attending the **Keynotes and Awards Session** from 4:00-6:30pm. Celebrate your colleagues and enjoy coffee and cake at the start! Then get your first peek at the AIC Exhibit Hall and learn from the exhibitors in a relaxed format during our reception in the Exhibit Hall following the Awards Session at 6:30pm.

ECPN Happy Hour (7:30 to 9:30pm)

Emerging Conservation Professionals can enjoy an informal networking session at Brit's Pub, a short walk form the hotel, sponsored by The Getty Conservation Institute.

CIPP Happy Hour (7:30 to 9:00pm)

CIPP group members join together for networking and discussions for a happy hour hosted at the hotel in Northstar B.

Thursday, May 29

Don't forget to purchase your reception tickets for the Specialty Receptions:

Paintings Happy Hour (5:30-6:30pm)

Paintings Specialty Group gets the parties started with a Happy Hour immediately following their Thursday afternoon sessions in the Northstar foyer.

Imaging Working Group Happy Hour and Studio Tour

Imaging Working Group members and fans can enjoy a studio tour at the Minneapolis Institute of Art.

ASG/BPG/PMG/TSG – Reception at Mill City Museum (6:30 to 9:30pm)

Join us for a special evening at Mill City Museum. Gallery access starts at 6:00pm and receptions start at 6:30pm. Arrive early for special tours highlighting the recent conservation work. Join your colleagues for tasty food and drink and great conversation. Learn about the museum's most recent conservation efforts and enjoy amazing views of the Mississippi River. You don't need to be a member of the sponsoring specialty groups to attend.

OSG/PCN/CAN!/EMG/WAG – Reception at Brit's Pub (7:00 to 9:30pm)

Join your colleagues for a fun night and tasty food and drink at Brit's Pub. starting at 7:00pm. Enjoy a well-appointed indoor/outdoor space and enjoy the camaraderie. Brit's Pub is a block from the Hyatt Regency and is accessible for those with disabilities.

Friday, May 30

Dinner and/or Drag After-party

Join us at **Roxy's Cabaret (7:30pm onward)**, conveniently located across the street from the Hyatt Regency. We have rented out the venue until 10 pm, at which point it will open to the public. There are two floors; the lower level is the cabaret for the drag shows and the 2nd floor has a lounge with an amazing outdoor balcony. Check Sched for the schedule and ticket options - VIP ticket includes food!

The later drag show will allow you time to join us for the newly added **Dinner at Owamni (8:15-8:45pm)**.

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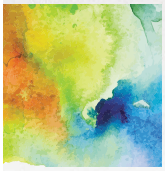

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ITEMS OF NOTE

Teacher Professional Development

The AIC K-12 Outreach Committee (a subcommittee of Communications-Outreach) is presenting a FREE in-person teacher professional development workshop at the Minnesota Historical Society on Tuesday, May 27, from 4-6 pm. The workshop is open to educators of all stripes - K-12 schools, colleges, museum educators, freelance teaching artists, etc. Link to register is https://www.mnhs.org/tedworkshops. If you have contacts or connections to educators in the area please do share this link! Six attendees have signed up so far and the committee is hoping to get a few more. The workshop qualifies for continued education units, and there will be free parking and SNACKS!

Local Guides

We're looking forward to engaging with Minneapolis' history, culture, and communities with you.

Attendee/Member Collaborative Guide

With the Annual Meeting just around the corner, folks are putting their schedules together for a great time in Minneapolis! While you're planning what sessions and talks to attend, don't forget to explore the town! If you're looking for food, drinks, coffee, bookstores, cultural sites, and more, here's a great place to start: There are also local places to support.

- Minneapolis Local Guide

Have recommendations of your own that aren't on the list? Please add them to the guide. Thanks to everyone who has compiled information and built out our local guide!

Art Guide by ACRL

The Association of College and Research Libraries (ACRL) created an art guide of the city for their recent conference. This map contains dozens of galleries, museums, studios, and other arts institutions in Minneapolis, compiled by MPLSART.

- Minneapolis and St. Paul Gallery Guide

Preventive Care Network Guide to Talks & Events

Preventive Care Network officers have been busy reading abstracts and making our own schedules for the week. Here are some sessions the officers are particularly excited about from a preventive care perspective that they think all attendees should check out!

- PCN Officer Guide to Events

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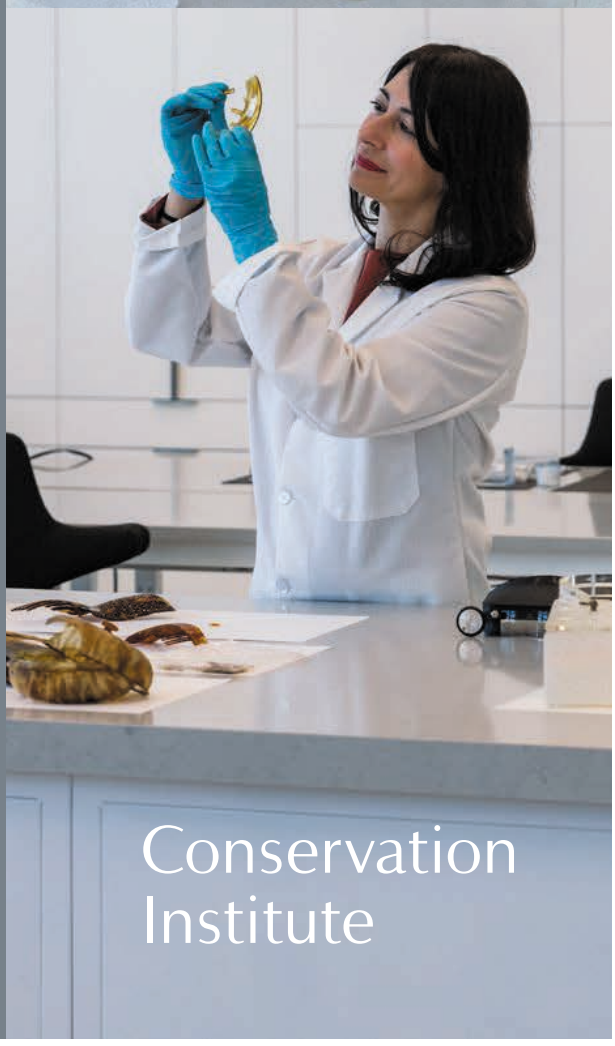


Conservation Institute

NON-SESSION HIGHLIGHTS

THROUGHOUT THE MEETING

Wellness: Quiet Room, Lactation Room, Running Groups

Our Quiet Room (Walker) and Lactation Room (Hennepin) are available throughout the conference for attendee use. Running groups can meet at 6:45am outside the hotel. See Sched for details.

MAY 28 ▸ WEDNESDAY

A Long Time Coming: Revising the AIC Ethics Core Documents (1:00-3:00pm, Regency)

Members of the core group of the AIC Ethics Core Documents Review Task Force will present the process followed to revise the AIC Code of Ethics, Guidelines for Practice, and Commentaries, and will host a discussion on the revisions thus far.

Paintings Group Easel Exchange (1:00-4:00pm, Mirage)

Easel Exchange allows conservators to informally present complex decision-making strategies for ongoing treatments, gain feedback on current practices, and generate ideas on paths forward. Tickets are $39.

Publishing Original Research in JAIC (2:00-3:00pm, Greenway F-G)

Potential authors, existing and aspiring reviewers, editors, and members of the journal's managing team will engage in an open dialogue about the publishing process.

MAY 29 ▸ THURSDAY

Preventive Conservation Network Idea Fair (12:45-1:45pm, Nicollet Foyer)

Learn about new companies and programs to increase your preventive conservation abilities.

Speed Mentoring hosted by INCCA — Contemporary Art Network (1:00-2:00pm, Northwoods)

Schedule three informal, 10-minute, one-on-one sessions with the mentors of your choice, pending availability. You can discuss anything with your speed mentor, but sign up in advance!

Paintings Specialty Group Happy Hour, sponsored by Kremer Pigments (5:30-6:30pm, outside Northstar)

Stay after the last talk of the day to mingle with your fellow Paintings Specialty Group members.

Objects Conservation Speed Networking (5:45-6:45pm, Northstar B)

Want to get to know more of your fellow objects conservators, but sometimes feel at a loss as to where to start? Stay after the Objects Session for this new pre-reception event.

MAY 30 ▸ FRIDAY

Paintings Specialty Group Morning Networking (8:00-9:00am, Northstar A)

Arrive early to meet other paintings conservators!

Respirator Fit Test Appointments (Northwoods)

Sign up in advance, and bring your respirator!

Book & Paper Wiki Meeting (12:00-1:00pm, Nicollet A-B)

Microfade Testing Informal Meetup (12:00-2:00pm, Regency)

Poster Author Q&A (3:30-4:00pm, Exhibit Hall)

MAY 31 ▸ SATURDAY

Textiles Wiki Meeting (3:00-4:00pm, Greenway F-G)

AIC Member Business Meeting (4:00-5:00pm, Nicolett B-D)

All members are welcome to join for an update on the state of the organization and passing leadership to the new president.

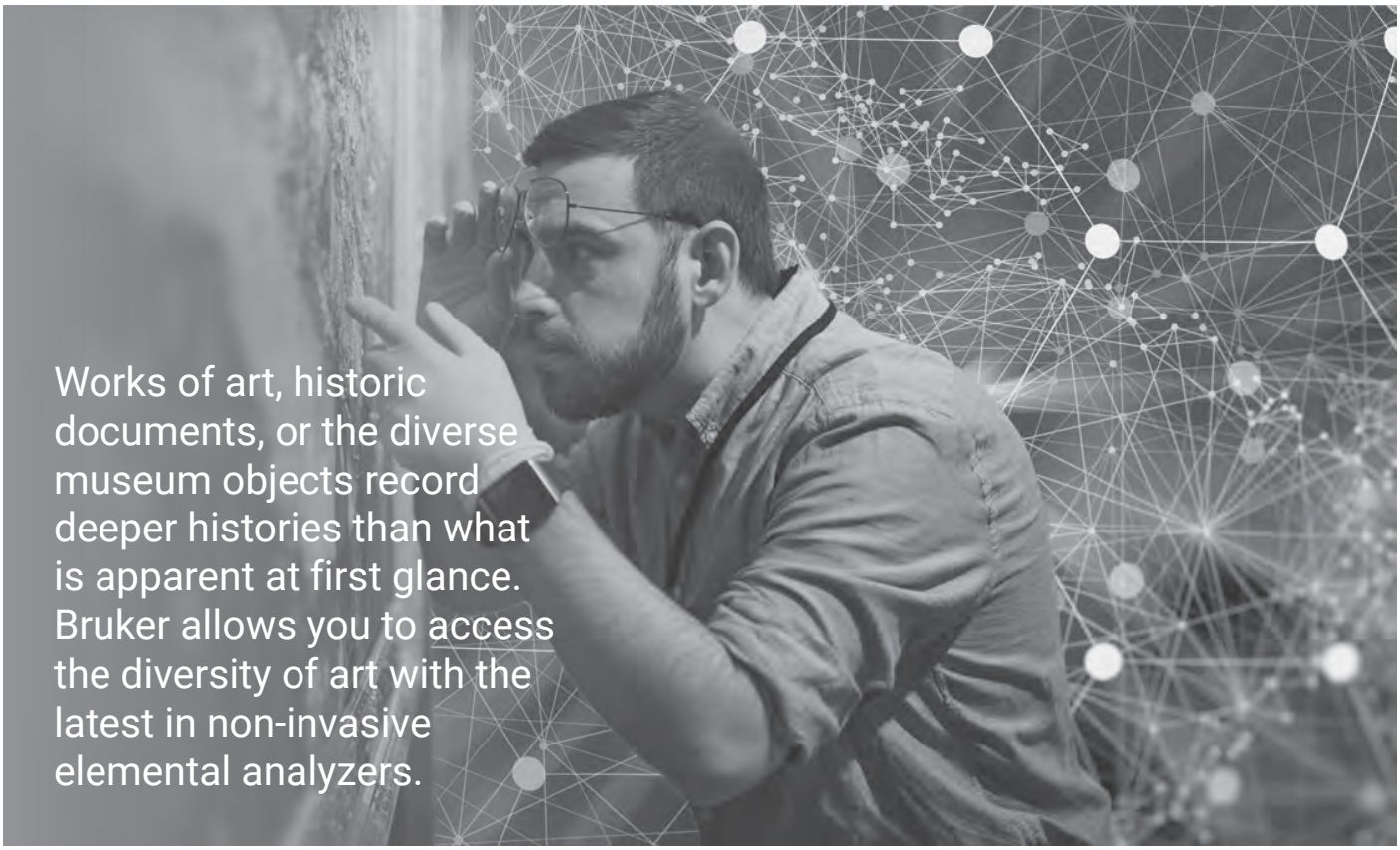
Mistakes Session (5:00-6:00pm, Nicolett B-D)

Please join us for "A Failure Shared is Not a Failure: Learning from Our Mistakes," our 8th annual event. It will be held as the closing session of the AIC Annual Meeting. It's always challenging, hilarious, sad, fun, sobering, and reassuring all at once!

Cash bar is available starting at 4:00pm.

Art & Conservation

Analysis at the Elemental Level



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Visit www.bruker.com/art-conservation

Keynotes & Award Ceremony

Ring in the new annual meeting with our keynote speakers and awards ceremony! On **Wednesday, May 28, 2025, from 4:00pm - 6:30pm CDT,** we open our meeting with a Land Acknowledgement by invited guest **Shelley Buck**, President of the Owámniyomni Okhódayapi, followed by her presentation about the Restoration of Owamniyomni. We are pleased to welcome **Jeanelle Austin**, Executive Director and Co-Founder, George Floyd Global Memorial, for the next keynote, addressing "Where do we go from here?: Reflections on the growing tensions between public art conservation and destruction in the United States."

Following these talks, President **Suzanne Davis** will lead our ceremony honoring members and allied professionals for outstanding and distinguished contributions to the field of conservation. The keynote and awards presentations will be livestreamed and recorded for all attendees. Learn more about your colleagues and their contributions to the field. Please join us in congratulating these recipients for 2025!

Shelley Buck

Jeanelle Austin

David Magoon-University Products Conservation Advocacy Award for conservation professionals who have advanced the field of conservation and furthered the cause of conservation through substantial efforts in outreach and advocacy.

Ariana Makau, Founder/President/Owner and Conservator of Nzilani Glass Conservation

Allied Professionals Special Recognition award for the work and contributions from professionals in other fields to the advancement of the conservation profession

Lauren Shadford, Executive Director of Voice in Contemporary Art (VoCA)

Robert L. Feller Lifetime Achievement Award for exceptional contributions to the conservation profession throughout one's career

Will Shank, Conservator at Conservation Resources Management

Debora Mayer, Conservator for Analysis and Technical Imaging at the Weissman Preservation Center of Harvard Library

Award for Excellence in Practice for the development and execution of hands-on skills in cultural heritage preservation by professionals at any stage of their career. We're grateful to offer this new award with support of the Maxwell/Hanrahan Foundation, which provides recipients with $2,000 and support to attend the AIC Annual Meeting.

Elizabeth Wigfield, Associate Paintings Conservator at The Art Institute of Chicago

Natasa Morovic, Conservator of Frames and Gilded Surfaces at the Fine Arts Museums of San Francisco

Rutherford John Gettens Award for outstanding service to the organization.

Beatriz Haspo, Library of Congress, USA, **Amparo Rueda**, APOYOnline, Colombia, and **Claire Cuyabère,** C2RMF, France, in representation of a large team of volunteer translators.

Honorary Membership for outstanding contributions to the conservation profession.

Lisa Goldberg, Conservator, Goldberg Preservation Services LLC

Sheldon and Caroline Keck Award for excellence in the education and training of conservation professionals

Joelle Wickens, Assistant Professor of Preventive Conservation, Winterthur/University of Delaware Program in Art Conservation

Jodie Utter, Head of Art Conservation at the Amon Carter Museum of American Art

Publication Award for excellence in an article or book on conservation

Nancy Odegaard and **Gerry Wagner Crouse**, *A Visual Dictionary of Decorative and Domestic Arts (2023)*

President's Award for their exceptional work to prioritize, educate about, and improve environmental sustainability in conservation and collections care.

AIC's Sustainability Committee

Distinguished Award for Advancement of the Field of Conservation for vital and long-standing support of professional development for conservation professionals.

The Metropolitan Museum of Art, for the conservation of Adam by Tullio Lombardo

FAIC's Foundation Service Award for individuals and organizations whose dedication and leadership have significantly advanced the conservation field.

Environment and Culture Partners

Emerging Leader Award for outstanding service to the organization by a member in the early stage of their career

Katherine Miromonti, graduate student in the SUNY Buffalo State Art Conservation Department

Don't forget to nominate your colleagues for an award! The annual deadline is February 1.

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LUNCHEON HIGHLIGHTS

MAY 29 ▸ THURSDAY

12:00pm – 2:00pm

Forging Connections: Working Together to Build and Sustain Small-Team Preservation Programs in Libraries and Archives

Are you a conservator or preservation technician working alone or in a small team, managing all aspects of preservation and/or conservation for both special and circulating library and archival collections? Do you find yourself navigating these responsibilities with limited resources or support? Join us for a lunch session to address these unique challenges that so many in our field experience, explore practical solutions for building and sustaining robust preservation programs, and continue to build your network.

In June 2024 a group of five "Lone Conservators" working in university libraries began meeting informally on Zoom every two weeks after connecting at AIC's Annual Conference in Salt Lake City. We come from different parts of the world and we share a common experience: each of us is tasked with handling multiple roles, as our institutions lack the budget for fully staffed Preservation/Conservation Departments. While some university libraries are creating preservation or collections care positions, these roles are often filled by just one conservator tasked with overseeing entire programs. As a result, what were once well-staffed preservation efforts are being reduced to smaller teams, leaving fewer people to manage large collections that continue to deteriorate. Over the months of meeting we are finding great support in one another by creating a cross-institutional department meeting, an active Discord channel, and a fileshare where we exchange helpful documentation and protocols. Our hope is to expand this network and connect with more conservators in similar roles, inviting them to join us and benefit from the support we've found in one another.

ALL LUNCHEON TICKETS ARE $35

(Buffets will include vegan, vegetarian, and gluten-free options)

Foundations of Spectral Imaging of Cultural Heritage Objects (Multiband, Multispectral and Hyperspectral Imaging)

Sponsors: Bruker, G.C. Laser Systems

The lunch session is designed to delve into the fundamental aspects of multiband (MBI), multispectral (MSI), and hyperspectral (HSI) imaging in a welcoming setting that invites learning, inquiry, and exchange. The first part of the session will include an invited presentation on light-matter interaction focusing on the phenomena that provides the foundation for MBI, MSI and HSI. The second part of the session shifts from phenomena to technique and will include two invited presenters to cover MBI and imaging spectroscopy (MSI and HSI). The presenters will define these techniques and their principles of operation, highlighting advantages and limitations of the techniques with case studies of applications and media. Presenters will also touch on instrumentation and requirements for setup, calibration, processing, and analysis. Other important topics include the knowledge required to acquire and interpret spectral data and variations in equipment setups and corresponding general price points. Each of the presentations will be followed by time for Q&A and a resource document will be assembled to share with participants. The session will be recorded as an intended resource for the community.

The lunch session fits into a larger imaging program at the Annual Meeting that includes a joint specialty session looking at case studies of applications and interpretation (BPG, PMG, RATS), and a concurrent general session pulling together a range of media, techniques, and applications.

Our Stories: Communicating Conservation when Presenting to a General Audience

Sponsor: Northeast Document Conservation Center

The work of art, architectural and archeological conservators is frequently covered in commercial media like The New Yorker, Atlantic, New York Times, LA Times, Washington Post, and Wall Street Journal. Yet only a handful of conservators have been actively writing our stories for general audiences. That is changing now, and this panel aims to show some of the strategies that some practitioners are using to communicate our ideas.

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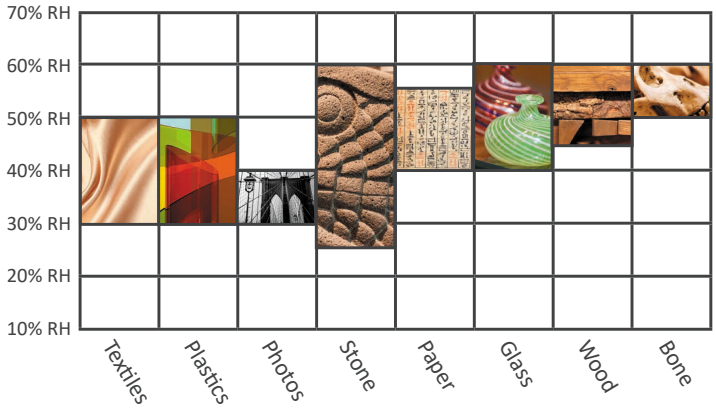

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LUNCHEONS

MAY 30 ▸ FRIDAY

12:00pm – 2:00pm

Embracing "It Depends": A Collaborative Discussion on Navigating Ambiguity in Art Conservation

Art conservation is a field filled with ambiguity, where often there is no single "right" answer to a conservation challenge. This uncertainty can be both frustrating and liberating, especially for students and emerging professionals who are accustomed to clear-cut solutions. In this interactive session, we will explore the role of uncertainty in conservation and how it can be leveraged to foster creativity, critical thinking, and resilience among early-career professionals.

Drawing from Madeline Hagerman's own experiences as a conservator and educator at the University of Delaware, she has observed that many students struggle with the concept of "it depends"—the idea that conservation solutions are rarely definitive and often require careful consideration of context, materials, and ethical implications. This session will feature a collaborative dialogue between Madeline, current undergraduate and graduate students, recent graduates, and board members from the Emerging Conservation Professionals Network (ECPN). Together, they will share insights and strategies for embracing uncertainty as a valuable aspect of the conservation process and provide reassurance that this feeling is universal, sharing helpful coping mechanisms.

Insurance for Conservators in Private Practice

In partnership with Mary Pontillo from Risk Strategies, we've developed a conservation-specific insurance guide tailored for private practices, which will be available to all CiPP group members. During the lunch, Mary will appear virtually to introduce a handbook that addresses key issues relevant to private practitioners and host a Q&A session. This will build on information presented in our April 29th CIPP Member Meetup. Please join your colleagues for this highly informative and essential session to learn the language and implication of how insurance decisions may impact your business.

Objects Tips Lunch

Sponsor: Wiss, Janney, Elstner Associates, Inc.

Share tips on treating objects with your colleagues.

The Impact of the New Orleans Charter After 30 Years: Collections in Historic Buildings

Join the Architecture Specialty Group (ASG) and Preventive Care Network (PCN) for lunch and an engaging discussion on the intrinsic connection between the care and maintenance of historic buildings and the preventive care of collections. The luncheon will feature panelists exploring the 1992 New Orleans Charter for the Preservation of Historic Structures and Artifacts, considering its impact over the past three decades, and examining how emerging challenges and trends shape its relevance today. This conversation will lay the foundation for a Symposium hosted by ASG and PCN in 2026, dedicated to reflecting and revisiting the Charter.

MAY 31 ▸ SATURDAY

12:00pm – 2:00pm

Sustainability in Collections Care: Centering on Context vs. Extending an Object's Physical Life

Sponsors: Conserv, DriSteem

Traditionally, cultural institutions have been dedicated to collecting in perpetuity. To accommodate this mission, we as conservators have prioritized extending the physical life of an object for as long as possible by reducing perceived risks at all costs. Several factors are driving us to question its sustainability and re-evaluate this approach:

- Museums continue to acquire, often without providing the additional resources needed to store and care for their growing collections. This leaves us strained to do the best we can under ever-increasing workloads.
- We are grappling with how collections reflect social and political reckonings. In doing so, we are making efforts to better connect with the cultures that artifacts originated from and the communities that our institutions serve.
- We are living and working through a climate crisis and are now acutely aware of the negative impact our actions, policies, and procedures may have on the global environment and its cultural heritage.

Four speakers will share their thoughts on how we can build a more sustainable future for collections by focusing on and honoring context, accessibility, and community in our work: Pejuta Haka Win Red Eagle, an Oglala Lakota & Wahpekute and Wahpetunwan Dakota winyan and an enrolled member of the Oglala Sioux Tribe, is a Curatorial Fellow in Anthropology at the Science Museum of Minnesota. Jane Henderson teaches at Cardiff University's BSc in Conservation and MSc in Conservation Practice programs and is the Secretary General of IIC. Jessica Walthew is an objects conservator at Cooper Hewitt Smithsonian Design Museum. Dr. Joelle Wickens is Assistant Professor of preventive conservation in the Department of Art Conservation at the University of Delaware.

Socratic Dialogue: What makes an object (in) valuable enough to conserve and preserve?

Led by William Wei, we welcome the 11th Annual AIC Annual Meeting Socratic Dialogue! A Socratic dialogue is a structured form of dialogue in which all participants actively contribute. The purpose of the dialogue is not to answer the questions of how one should treat lacunae. The Socratic method provides a safe, open environment for participants to reflect on what it is that makes the decision-making process so difficult, and to investigate what the essence is behind their own points of view as well as those of others. **This session will not be recorded**.

Paintings Conservation Tips Luncheon

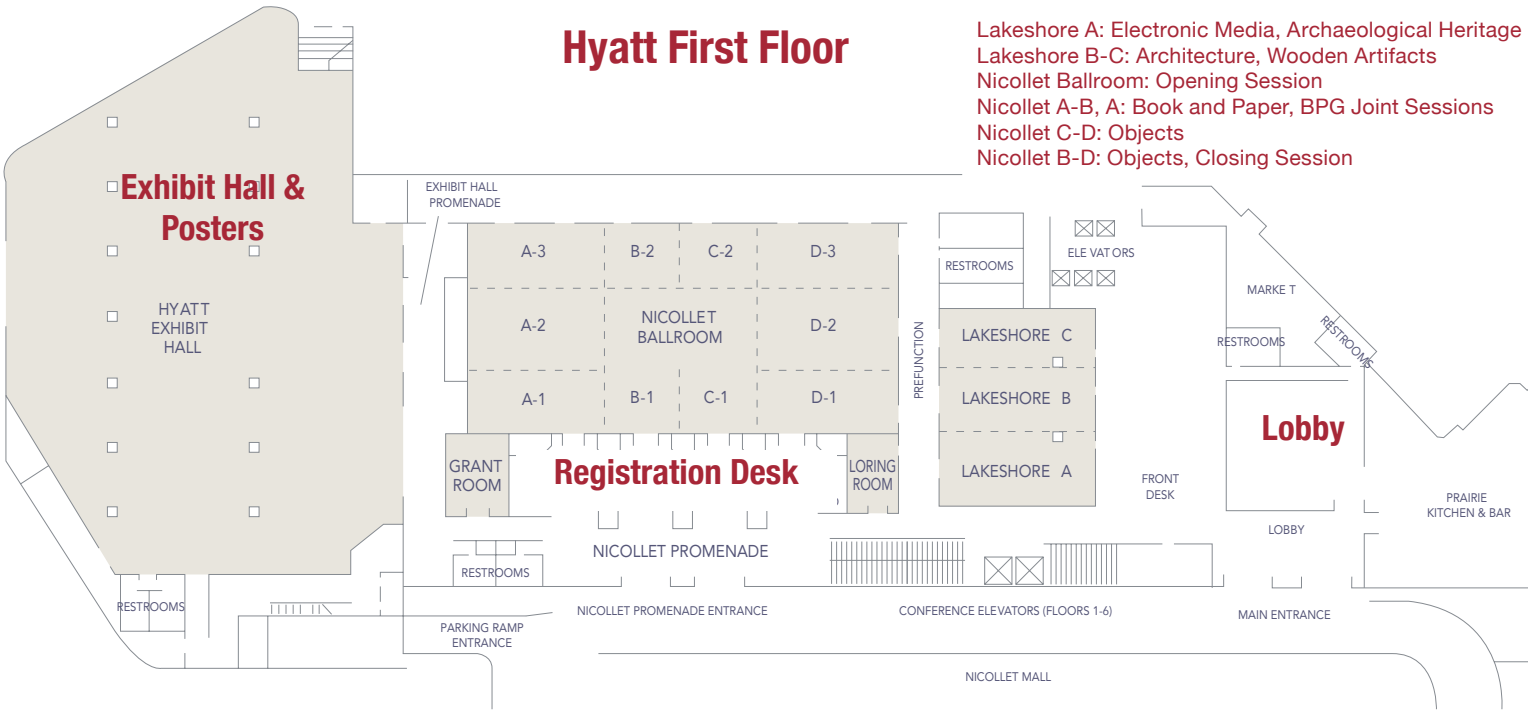
Share tips on treating paintings with your colleagues.

Hotel Map

Offsite Departures: Tours, workshops, and receptions will depart from the Hyatt Regency lobby.

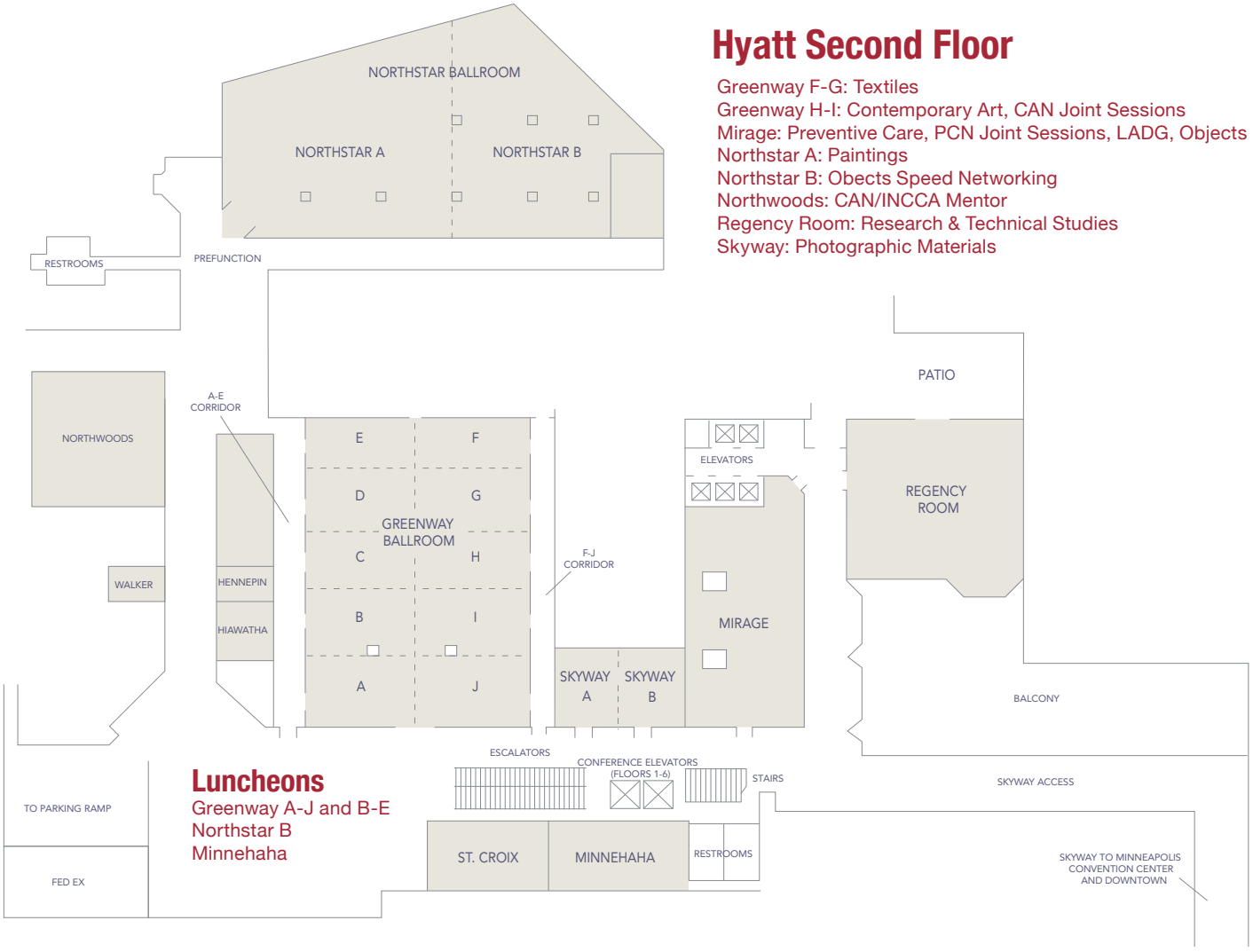
Hyatt First Floor

Lakeshore A: Electronic Media, Archaeological Heritage
Lakeshore B-C: Architecture, Wooden Artifacts
Nicollet Ballroom: Opening Session
Nicollet A-B, A: Book and Paper, BPG Joint Sessions
Nicollet C-D: Objects
Nicollet B-D: Objects, Closing Session



Hyatt Second Floor

Greenway F-G: Textiles
Greenway H-I: Contemporary Art, CAN Joint Sessions
Mirage: Preventive Care, PCN Joint Sessions, LADG, Objects Panel
Northstar A: Paintings
Northstar B: Obects Speed Networking
Northwoods: CAN/INCCA Mentor
Regency Room: Research & Technical Studies
Skyway: Photographic Materials



Luncheons

Greenway A-J and B-E
Northstar B
Minnehaha

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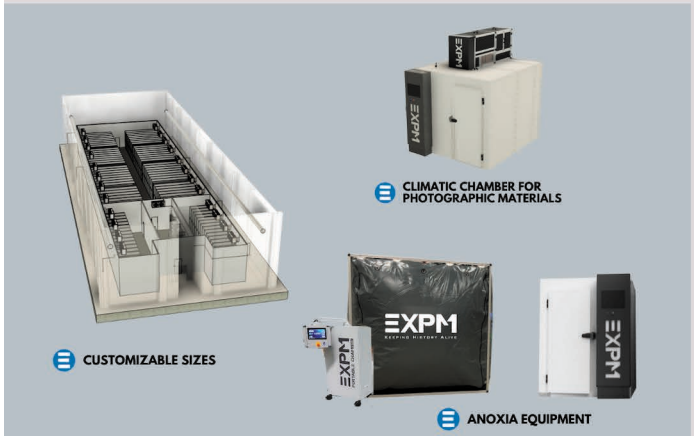

Program

Day by Day
Posters
Exhibit Hall

AIC'S 53rd ANNUAL MEETING

Day by Day Schedule

MAY 27 TUESDAY

WORKSHOPS

9:00am – 5:00pm	Crating 101 Walker Art Center (725 Vineland Place, Minneapolis, MN 55403)
9:00am – 5:00pm	Applications for Nanocellulose Gels and Films in Conservation Midwest Art Conservation Center (2400 3rd Avenue S, Minneapolis, MN 55404) Transportation from and to the Hyatt will be provided. Please be in the lobby 5-10 minutes early.
1:00pm – 5:00pm	Exploring Flexible Adhesives for Leather Treatments Lakeshore A

TOURS

All tours depart from the Hyatt Regency lobby; meet at least 5 minutes before the time listed below. Look for staff to guide you.

1:30pm – 4:00pm	Walking Tour of Owamniyomni Falls (formerly known as St. Anthony Falls) - $29
1:30pm – 4:30pm	Minnesota Historical Society - Conservation Labs - $25
2:00pm – 4:00pm	Purcell-Cutts House Tour - $39
4:00pm – 6:00pm	Conservation at Work Tour of the Basilica of Saint Mary - $20
4:00pm – 6:00pm	Traditional Stone Lithography- Demonstration at C&C Editions - (FULL) (3041 Aldrich Avenue S. Suite 101 Minneapolis, MN 55408) Sponsor: Hiromi Paper

DINNER

6:15pm – 8:45pm	Dinner at Owamni (SOLD OUT) Owamni (420 S. 1st St • Minneapolis MN 55401)

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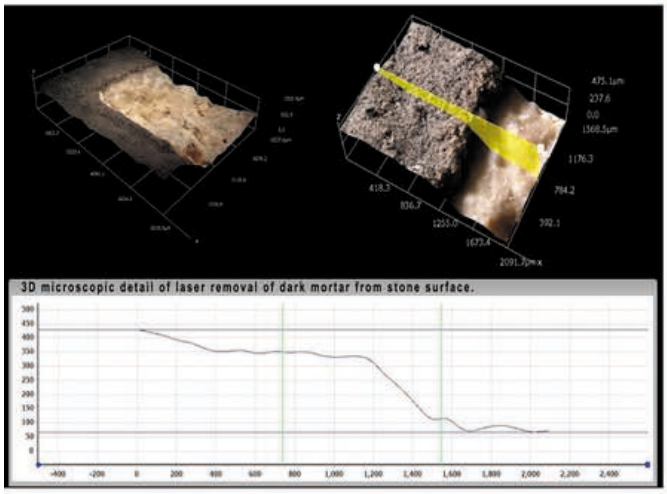

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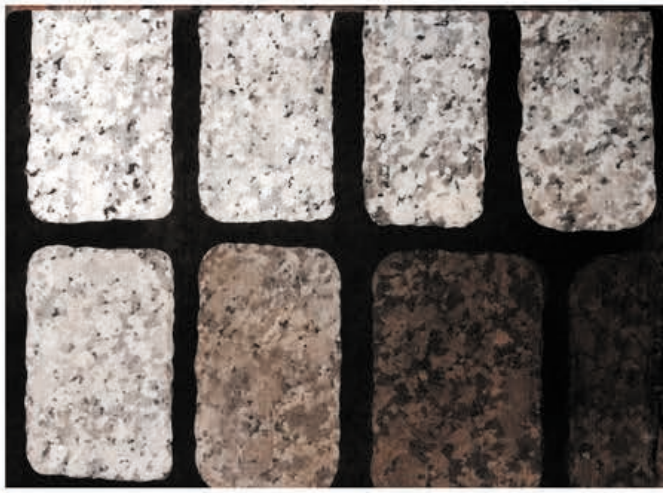

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MAY 28 WEDNESDAY

KEYNOTE & AWARDS CEREMONY

4:00pm – 6:30pm Land Acknowledgement, Keynote Presentations, & Awards Ceremony (Nicollet Ballroom)

6:30pm – 8:30pm Exhibit Hall Reception and Posters on view

Don't miss our keynote and awards ceremony! We are thrilled to welcome Shelley Buck, President of Owámniyomni Okhódayap, for this meeting's land acknowledgment and first keynote presentation of the evening. She will be followed by Jeanelle Austin, Executive Director and co-founder of the George Floyd Global Memorial, Lead Caretaker of the memorials at George Floyd Square, and founder of Racial Agency Initiative, whose keynote will discuss "Where do we go from here?: Reflections on the growing tensions between public art conservation and destruction in the United States. We are grateful that they chose to join us and celebrate the opening of our 53rd annual meeting. After the keynotes, we welcome AIC President Suzanne Davis as she presents our awards ceremony. See page 22 for the list of awardees.

WORKSHOPS

9:00am – 12:30pm Inclusive Mentorship: The Stories We Tell Ourselves
Greenway B-E

9:00am – 4:00pm Contract Couriers
Lakeshore B-C

9:00am – 5:00pm Crating 101
Walker Art Center (725 Vineland Place, Minneapolis, MN 55403)

TOURS

All tours depart from the Hyatt Regency lobby; meet at least 5 minutes before the time listed below. Look for staff to guide you.

9:00am – 3:30pm Tru Vue Behind the Scenes - $15

9:30am – 12:00pm Walking Tour of Owamniyomni Falls (formerly known as St. Anthony Falls) - $29

9:30am – 3:00pm "Lab & Learn" with the Science Museum of Minnesota

9:30am – 4:00pm Twin Cities Gilded Age and Victorian Architectural Gems - $85

10:00am – 12:00pm Intaglio /Copper Etching Plate Printing-Demonstration at C&C Editions - (FULL)
(3041 Aldrich Avenue S. Suite 101 Minneapolis, MN 55408)
Sponsors: Hiromi Paper

PRE-SESSIONS

9:00am – 4:00pm Applying sustainability principles cross-departmentally at collecting institutions - $125
The Museum of Russian Art (5500 Stevens Ave, Minneapolis, MN 55419, USA)
Sponsor: Conserv

1:00pm – 3:00pm A Long Time Coming: Revising the AIC Ethics Core Documents
Regency Room

1:00pm – 4:30pm Paintings Group Easel Exchange - $39
Mirage Room

2:00pm – 3:00pm Publishing Original Research in JAIC
Greenway F-G
Speakers: Julio M. del Hoyo-Meléndez, Dr. Corina (Cory) Rogge, Sarah Reidell, and Carmina Lamare-Bertrand

OTHER EVENTS

4:00pm – 6:30pm Awards and Keynote Presentations
Nicollet Ballroom

6:30pm – 8:30pm Exhibit Hall Grand Opening and Reception

7:30pm – 9:00pm Conservators in Private Practice Happy Hour
Northstar B

7:30pm – 9:30pm Emerging Conservation Professionals Happy Hour (ECPN) Brit's Pub
(1110 Nicollet Mall, Minneapolis, MN 55403)
Sponsors: Getty Conservation Institute

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OPENING GENERAL SESSION - NICOLLET BALLROOM

8:00am – 8:25am Welcome and Opening Remarks

8:30am – 8:47am In Commitment to Community: BACC's Journey into Radical Inclusion
Speaker(s): Leticia Gomez Franco, Bianca Garcia

8:47am – 9:04am Considering Elements of Effective Collaboration at the National Museum of the American Indian
Speaker(s): Kelly McHugh

9:04am – 9:21am Powerful Places: cultivating cultural resilience in Minnesota's sacred ecological sites
Speaker(s): Justine Wuebold

9:21am – 9:38am Curiosa Naturalia: bringing a natural history collection back to life
Speaker(s): Mariana Di Giacomo

9:38am – 9:55am Threads of Time: Discovering a 19th-Century Faroese Knitted Sweater
Speaker(s): Marina Casagrande, Sarah Noble

10:00am – 10:55am Morning Break in the Exhibit Hall

10:55am – 12:00pm Telling Your Story: Thinking about Funding Perspectives

LUNCH SESSIONS - $35

12:00pm – 2:00pm Forging Connections: Working Together to Build and Sustain Small-Team Preservation Programs in Libraries and Archives (in Greenway A-J)

12:00pm – 2:00pm Foundations of Spectral Imaging of Cultural Heritage Objects (Multiband, Multispectral and Hyperspectral Imaging) (in Northstar B)
Sponsors: Bruker, G.C. Laser Systems

12:00pm – 2:00pm Our Stories: Communicating Conservation when Presenting to a General Audience (in Greenway B-E)
Sponsors: Northeast Document Conservation Center

12:00pm – 2:00pm JAIC Editors Business Meeting (in Loring)

MENTORING/NETWORKING SESSIONS

1:00pm – 2:00pm Speed Mentoring (in Northwoods Room)
Sponsors: INCCA, Contemporary Art Network (CAN!)

12:45pm – 1:45pm Preventive Conservation Network Idea Fair in Nicollet Foyer

ARCHITECTURE - LAKESHORE B-C

2:00pm – 2:30pm Solution from Nature: Psyllium Husk as a Biological Amendment for Soil-based Shelter Coat Protection of Earthen Heritage
Speaker(s): Jiwen Fan

2:30pm – 3:00pm Heat, Humidity, and Pressure: Leveraging Techniques from Other Disciplines to Preserve Graffiti and Architectural Paints at a Historic Prison Museum
Speaker(s): Meris Westberg

3:00pm – 3:30pm Bridging the Gap Between Real and Virtual: A Digital Interface for a Building Materials Collection
Speaker(s): Jose Hernandez

3:30pm – 4:00pm Afternoon Break in the Exhibit Hall

4:00pm – 4:30pm Partners in Preservation: The importance of collaboration during construction at the Lower East Side Tenement Museum
Speaker(s): Stephanie Hoagland

4:30pm – 5:00pm It takes a village to save an American Treasure: Preserving the Swimming Pool Grotto ceiling mural at Vizcaya Museum and Gardens
Speaker(s): Davina Kuh Jakobi

BOOK AND PAPER - NICOLLET A-B

2:00pm – 2:30pm Expanding Access: Inclusive Conservation and Education Engagement at The UK National Archives
Speaker(s): Natalie Brown

2:30pm – 3:00pm Blueprint for Growth: A Journey of Architecture Designs
Speaker(s): Sanira Karim Gani, Tay Jam Meng

3:00pm – 3:30pm Archivists and Conservators: An Unlikely Love Story
Speaker(s): Laura McCann, Weatherly Stephan

3:30pm – 4:00pm Afternoon Break in the Exhibit Hall

4:00pm – 4:30pm Manuscripts that multiplied – stories from the parchment partnerships
Speaker(s): Fenella France

4:30pm – 5:00pm Keeping the Wolf from the Door: Remediating the Effects of Pressure-sensitive Tape While Preserving Artistic Intention
Speaker(s): Mary French

CONTEMPORARY ART - GREENWAY H-I

2:00pm – 2:30pm Direct Approaches to Complex Situations: Collaborating to Display Contemporary Textiles at the Los Angeles County Museum of Art
Speaker(s): Kristal Hale

2:30pm – 3:00pm Mud Musings: Changing Systems and Ideas in Robert Rauschenberg's Sound-Activated Artworks
Speaker(s): My Bundgaard, Caroline Carlsmith

3:00pm – 3:30pm Building collaborative networks of care for the conservation of Chryssa's neon works
Speaker(s): Joy Bloser

3:30pm – 4:00pm Afternoon Break in the Exhibit Hall

4:00pm – 4:30pm In name only? Collecting and caring for non-delegated performance artworks
Speaker(s): Brian Castriota

4:30pm – 5:00pm A Prophylactic Treatment: Two Condom Collage Replications in Joanne Leonard's Journal of a Miscarriage (1973)
Speaker(s): Clara Rojas Sebesta

5:00pm – 5:30pm On the intersection of art and human rights: Collective efforts to preserve the work of imprisoned artist Luis Manuel Otero Alcantara
Speaker(s): Salomé García Bacallao, Anamely Ramos Gonzalez

ELECTRONIC MEDIA - LAKESHORE A

2:00pm – 3:00pm Machine Learning in Art: Tools, Techniques, and Implications for Conservation
Speaker(s): Deena Engel

2:30pm – 3:00pm Video Archives for Media Archaelogy: Steina Vasulka and Live A/V Processing in the 90s
Speaker(s): Joseph G Heinen Jr.

3:00pm – 3:30pm Pay No Attention to that Unit Behind the Curtain: Identification, Assessment, and Documentation of Control Systems
Speaker(s): Tom Ensom, Daniella Briceño Villamil

3:30pm – 4:00pm Afternoon Break in the Exhibit Hall

4:00pm – 4:30pm Refining Workflows: Using the Iteration Report as an Advocacy Tool
Speaker(s): Adrian Hernandez, Caroline Gil Rodríguez

4:30pm – 5:00pm More Than Meets the Eye: New Methods for Testing Artwork Iterations
Speaker(s): Emma Dickson, Cass Fino-Radin

OBJECTS - NICOLLET C-D

2:00pm – 2:30pm New African Masquerades: Flexible mounts for a collaborative exhibition
Speakers: Ingrid Seyb

2:30pm – 3:00pm A Sterling Conservation Project: Preparing 1200 Pieces of Gorham Silver for Exhibition and Travel
Speakers: Ingrid A. Neuman

3:00pm – 3:30pm Rediscovering and assembling painted wooden boxes from King Tutankhamun's collection: a collaborative approach
Speakers: Ahmed Abdrabou

3:30pm – 4:00pm Afternoon Break in the Exhibit Hall

4:00pm – 4:30pm Mighty Powder: Demonstrating that fumed silica increases the adhesive strength of Acryloid B-72
Speakers: Renée Stein

4:30pm – 5:00pm Exploring Consolidation of Degraded Natural Foam Rubber
Speakers: Lindsay Cross

5:00pm – 5:30pm Bulked B-72 Fills
Speakers: Carolyn Riccardelli

PAINTINGS - NORTHSTAR A

2:00pm – 2:30pm Case studies in Collaboration: 17th century painting workshops to 21st century conservation studios
Speaker(s): Nikita Shah

2:30pm – 3:00pm "It's the small pieces that make the big picture": The structural treatment of An Allegory of the Tudor Succession
Speaker(s): Kristin Holder

3:00pm – 3:30pm Corneille de Lyon heart: technical studies of a late Renaissance portraitist and his workshop in France
Speaker(s): Roxane Sperber, Carlandrea Tortorelli

3:30pm – 4:00pm Afternoon Break in the Exhibit Hall

4:00pm – 4:30pm A Collaboration Between Two Private Practice Firms: The Conservation and Restoration of Noël Hallé's Abraham and the Three Angels
Speaker(s): Corrine Long, Gianfranco Pocobene

4:30pm – 4:50pm Beva 371: past, present, and future
Speaker(s): Kristin Patterson, Dean Yoder

4:50pm – 5:10pm BEVA 371: An examination of morphological properties and the visualization of stress in mock painting samples using advanced thermal, spectroscopic, and imaging methods
Speaker(s): Erin Crater

5:00pm – 5:10pm Bringing BEVA 371 into the future: refinements and expanded forms
Speaker(s): Ali Dhinojwala

5:10pm – 5:25pm BEVA Q&A

PHOTOGRAPHIC MATERIALS - SKYWAY ROOM

2:00pm – 2:30pm Application of High-Resolution Multispectral Imaging Systems for the Very-Long-Term Monitoring of Degradation Over Time of Photographs, Paintings, Fabrics, Documents, Books, and Other Cultural Heritage Materials
Speakers: Henry Wilhelm

2:30pm – 3:00pm "Lights on Vivex prints!" Raman identification and microfade testing of coloring materials
Speakers: Céline Daher, Loys Boivin

3:00pm – 3:30pm The Wayside: House of Authors in Concord, MA, Introduction to Conservation and Preservation Efforts for Framed Photographs on Display
Speakers: Karina Beeman

3:30pm – 4:00pm **Afternoon Break in the Exhibit Hall**

4:00pm – 4:30pm Handcrafted Preservation: Custom Storage Solutions for Photographs at the Archivo de la Memoria Trans Argentina- Remote Presentation
Speakers: Carolina Nastri

4:30pm – 4:45pm Conservation of the portrait of Leonardas Biržiška (1809 –1902) - Remote Presentation
Speakers: Elvina Karosienė

4:45pm – 5:00pm Developing Conservator: My Journey in Darkroom Photography
Speakers: Sophie Church

5:00pm – 5:30pm De "mist"ifying the Dahlia Sprayer
Speakers: Seth Irwin

PREVENTIVE CARE - MIRAGE ROOM

2:00pm – 2:30pm Meeting in the Middle: Best Practices and Practical Actions Unite in Community Collaboration
Speakers: Katie Risseeuw

2:30pm – 3:00pm |Van Gogh in motion: Safeguarding lined and unlined Van Gogh paintings from vibration and mechanical shock during transport - Remote Presentation
Speakers: Kerstin Kracht

3:00pm – 3:30pm A Multi-Strategy Approach to Preventive Conservation for historic wooden objects
Speakers: Amanda Hahn, Hebe Halstead

3:30pm – 4:00pm **Afternoon Break in the Exhibit Hall**

4:00pm – 4:30pm Heat protective covers: Enhancing Fire Preparedness for Cultural Collections and the case study of Emergency Planning in France
Speakers: Gregoire Bernand, Caleb Fields

4:30pm – 5:00pm Turning Leaks into Lessons: Insights from a Water Leak Response in University Special Collections
Speakers: Elise Etrheim, Fleur van der Woude

5:00pm – 5:30pm Other duties as assigned: the unexpected tasks of preventive care and the lessons of a pre-program Preservation Assistant
Speakers: Elise Etrheim

RESEARCH & TECHNICAL STUDIES - REGENCY ROOM

2:00pm – 2:30pm A multi-disciplinary solution for the problem of lead corrosion in organ pipes
Speaker(s): William Wei

2:30pm – 3:00pm Museums and Zoos: A case study of an unusual collaboration for heritage science research and public outreach
Speaker(s): Cathryn Harvey

3:00pm – 3:30pm Testing for lead on sculpture: defining useful thresholds in a liability- and safety-minded America
Speaker(s): Sarah Montonchaikul, Ellen Rand

3:30pm – 4:00pm Afternoon Break in the Exhibit Hall

4:00pm – 4:30pm The role of adsorption in the solubilization of paper degradation products: Using treatment observations as a springboard for scientific advances
Speaker(s): Teresa Duncan

4:30pm – 5:00pm On the development of Xanthan-Konjac/ Agar physical hydrogels and their analogs for conservation cleaning applications
Speaker(s): Matthew Cushman

5:00pm – 5:30pm Developments in Safer Solvent Selections for the Removal and Application of Synthetic Resins
Speaker(s): Melinda Keefe

TEXTILES - GREENWAY F-G

2:00pm – 2:30pm Facing the Unknown Together: Conservation of Mexican Costume Collection by Pedro Loredo
Speaker(s): Alejandra Flores Paredes, Zulema Paz Rodriguez

2:30pm – 3:00pm If you Give a Mouse a Cookie: The use of Solvent Gels, Painted Overlays, and a Heating Pad in the Treatment of a Crazy Quilt
Speaker(s): Michelle Leung

3:00pm – 3:30pm It Takes a Village: Collaborations as a Critical Element in the Development of Pesticide Safety Programs
Speaker(s): Maria Fusco

3:30pm – 4:00pm Afternoon Break in the Exhibit Hall

4:00pm – 4:30pm Strategic(?) use of adhesive in treating fractured silk gauze layers of a complex garment.
Speaker(s): Jennifer L. Cruise

4:30pm – 4:45pm Reflections on Twenty-Five Years in Private Practice
Speaker(s): Camille Myers Breeze

4:45pm – 5:30pm Private Practice Panel and Q/A

HAPPY HOURS/RECEPTIONS

5:30pm – 6:30pm Paintings Specialty Group Happy Hour in Northstar Promenade
Sponsors: Kremer Pigments

5:45pm – 6:45pm Objects Conservation - Speed Networking Session
Northstar B

6:30pm – 9:00pm Imaging Working Group Happy Hour/Studio Tour
Minneapolis Institute of Art
(2400 3rd Ave S, Minneapolis, MN 55404)

6:30pm – 9:30pm Reception at Mill City Museum (ASG/BPG/PMG/TSG)
(704 South 2nd St. Minneapolis, MN 55401)
Sponsors: Testfabrics, Inc., Opus Instruments Ltd (Atik Cameras), Hollinger Metal Edge, Inc.

7:00pm – 9:30pm Reception at Brit's Pub - (OSG/CAN!/EMG/PCN/ WAG) (1110 Nicollet Mall, Minneapolis, MN 55403)

MAY 30 FRIDAY

OTHER EVENTS

8:00am – 9:00am Paintings Specialty Group Networking Event
Northstar A

8:00am – 4:00pm Respirator Fit Test Appointments, Northwoods Room

LUNCH SESSIONS - $35

12:00pm – 2:00pm Embracing "It Depends": A Collaborative Discussion on Navigating Ambiguity in Art Conservation
Greenway A-J
Speaker(s): Madeline Hagerman

12:00pm – 2:00pm Insurance for Conservators in Private Practice
Greenway B-E
Speaker(s): Mary Pontillo

12:00pm – 2:00pm Objects Conservation Tips Lunch
Northstar B
Sponsors: Wiss, Janney, Elstner Associates, Inc.

12:00pm – 2:00pm The Impact of the New Orleans Charter After 30 Years: Collections in Historic Buildings
Minnehaha Room
Moderators: Héctor J. Berdecía-Hernández, Kelly McCauley, Speaker(s): Paul Himmelstein, Patricia Silence, Meris Westberg, Todd Grover
Sponsors: EXPM - Keeping History Alive

ARCHITECTURE + PREVENTIVE CARE - MIRAGE ROOM

8:30am – 9:00am Understanding the Problem and Defining the Goal: Environmental Assessments in Historic Buildings and Collections in the NPS, Region 1
Speaker(s): Margaret D. Breuker

9:00am – 9:30am Building Together Better: Establishing Dynamic Models for Collections Storage Planning at The New York Public Library Research Libraries
Speaker(s): Rebecca Fifield

9:30am – 10:00am Preserving Ukraine's Cultural Heritage during Russia's Invasion
Speaker(s): Marila Salyuk

10:00am – 10:30am Morning Break in the Exhibit Hall

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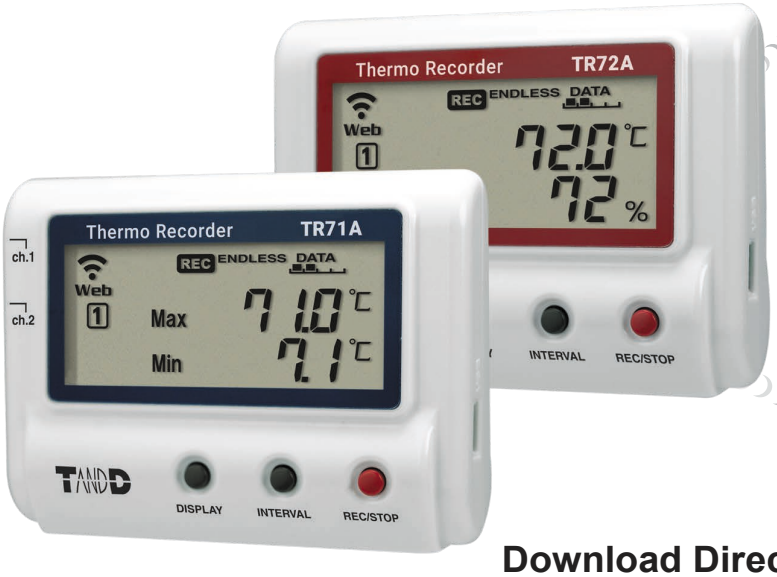

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Come see us in the Exhibit Hall!

10:30am – 11:00am Let There Be Light (Or Maybe Not)
Speaker(s): Gretchen Anderson

11:00am – 11:30am Common HVAC issues and ways to avoid or correct them
Speaker(s): Christopher Cameron

11:30am – 12:00pm Flood Barriers: Examining and Improving Flood Preparedness at Museums and Sites in Historic Buildings
Speaker(s): Meris Westberg

BOOK AND PAPER + PHOTOGRAPHIC MATERIALS + RATS + IMAGING - NICOLLET A-B

9:00am – 9:15am Colorant Detectives: An Interactive Dichotomous Key for Multiband Imaging
Speaker(s): L. M. Ramsey
Sponsors: T and D US

9:15am – 9:30am Automating Image Registration with OpenCV-Python: Lowering the Cost Barrier for Multiband and Multispectral Imaging Setups
Speaker(s): Jiuan Jiuan Chen, Grace Wilkins
Sponsors: T and D US

10:00am – 10:30am Morning Break in the Exhibit Hall

10:30am – 11:00am The Ties That Bind: Communication, Collaboration, and Cross-Disciplinary Professional Development in the Service of Library Special Collections
Speaker(s): Aude Gabory, Kimberly Kwan, Elizabeth Ryan

11:00am – 11:30am A History of the Books in Taiwan: The Transformation of Bookbinding Formats During the Period under Japanese Rule (1895-1945)
Speaker(s): Lois Su

11:30am – 11:45am Sympathetic to Synthetics: Developing Tear Repairs for Matte Laminated Papers in Twenty-first Century Periodical Covers
Speaker(s): Cancy Chu

11:45am – 12:00pm When Outreach Reaches Back: The Treatment and Re-Treatment of Katsukawa Shunshō's Abalone Fishergirl with an Octopus
Speaker(s): Amanda Burr

CONTEMPORARY ART + VOCA - GREENWAY H-I

8:30am – 9:00am The conversation in a language of love. Passion or murder? An interactive presentation between Chilean artist Daniela Rivera and Spanish conservator Ruth del Fresno-Guillem
Speaker(s): Ruth Del Fresno-Guillem, Daniela Rivera

9:00am – 9:30am Planting the Seed: Collaboration in the Preservation of Kraus Campo
Speaker(s): Gwynne Ryan

9:30am – 10:00am Developing a Designer Residency Program From the Ground Up
Speaker(s): Sarah Barack, Jessica Walthew

10:00am – 10:30am Morning Break in the Exhibit Hall

10:30am – 11:00am The Evolution of Glenstone Museum's Artist Oral History Program

11:00am – 11:30am Bringing in new voices: the next generation of the Artist Documentation Program
Speaker(s): Corina Rogge, Matthew Skopek

11:30am – 12:00pm Evolving Dialogues: Revisiting the Artist Interview
Speaker(s): Sarah Barack, Steven O'Banion, Daniela Rivera, Gwynne Ryan, Matthew Skopek

ELECTRONIC MEDIA - LAKESHORE A

10:30am – 12:00pm Learning on the Job with Maintenance Culture: Creating a digital media art preservation Field Guide and trainings for small shops and artists - a 90 minute panel
Speaker(s): Elena Cordova, Frances Harrell, Joseph G Heinen Jr.

OBJECTS - NICOLLET C-D

8:30am – 9:00am Fit to float: Conservation of a Painted Canvas and Birchbark Canoe
Speaker(s): Sejal Goel, Fran E. Ritchie

9:00am – 9:30am "Turning the Feather Around": Conservation of a Monumental George Morrison Mural
Speaker(s): Megan Emery, Courtney Murray

9:30am – 10:00am Radiography in the Round: Capturing and Viewing X-rays in 360°
Speaker(s): Arlen Heginbotham

10:00am – 10:30am Morning Break in the Exhibit Hall

10:30am – 11:00am Perpetual Conservation: a continuing collaboration to conserve Jack Nelson's kinetic Sculpture Clock
Speaker(s): Nicole Flam, Laura Kubick

11:00am – 11:30am Gorgonized by Her Monsterful Snoutfair Visage: Harriet Hosmer's Medusa in Context
Speaker(s): Clara Livingston Bailin

11:30am – 12:00pm Still Got The Blues: The Technical Study and Conservation Treatment of a Tian-Tsui Headdress
Speaker(s): Devon Lee

PAINTINGS - NORTHSTAR A

9:00am – 9:30am Preserving Oversize Paintings: Collaborative Innovations between Paintings Conservation and Collections Management at the Heritage Conservation Centre, Singapore
Speaker(s): Filzah Mohd Amir, Irene Dominguez Jimenez

9:30am – 10:00am Andy Warhol's Oxidation Paintings
Speaker(s): Rikke Foulke

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10:00am – 10:30am **Morning Break in the Exhibit Hall**

10:30am – 11:00am A Mysterious Pair: the treatment and technical study of Veronese's Allegories of Navigation at LACMA
Speaker(s): Gerrit Albertson

11:00am – 11:30am "I paint paintings": The materials, techniques, and conservation of Joan Mitchell's Paintings on Canvas
Speaker(s): Pamela Johnson, Shauna Young

11:30am – 12:00pm Conservator as Project Manager:Lessons I learned and friends I made while moving a Keith Haring Mural
Speaker(s): Nina Roth Wells

RESEARCH & TECHNICAL STUDIES - REGENCY ROOM

10:30am – 11:00am Challenges and benefits of community-based participatory research (CBPR) in technical art history and conservation science: The Tikuna/Magüta blue case
Speaker(s): Thiago Puglieri

11:00am – 11:30am Embracing Uncertainty: Exploring New Perspectives in the Story of a Chinese Lacquer Screen
Speaker(s): Elle Friedberg

11:30am – 12:00pm Our Elusive Yellow Whale: New Findings on the History and Identification of Patent Yellow/Lead Oxychloride Pigment in Painted Heritage Objects
Speaker(s): Dr. Jocelyn Alcantara Garcia, Kirsten T. Moffitt

TEXTILES - GREENWAY F-G

8:30am – 9:00am "Form Inventions": A Technical Analysis of Barbara Rossi's Prints on Textiles
Speaker(s): Megan Creamer, Stephanie Strother

9:00am – 9:30am In the French Style: The Conservation of an 18th Century Chinese Tapestry in the Collection of the Cleveland Museum of Art
Speaker(s): Margaret O'Neil

10:00am – 10:30am **Morning Break in the Exhibit Hall**

10:30am – 11:00am Glue Me Once, Glue Me Twice: Adhesive Retreatment of an Early 18th C Embroidered Palampore
Speaker(s): Annalise M. Gall, Karri Vaughn

11:00am – 11:30am Alf Engen Ski Museum Gets a Lift
Speaker(s): Reilly Jensen

11:30am – 12:00pm A comparative practical study to evaluate the impact of the selected Bio and Synthetic polymers loaded with cleaning agents applied for reduction different stains from dyed stained wool fabric
Speaker(s): Heba Saad, Eman Osman

WOODEN ARTIFACTS - LAKESHORE B-C

8:30am – 9:00am Unleashing the Evidence: Creating an Interactive Didactic Centered on Conservation-Derived Content
Speaker(s): Eve Mayberger

9:00am – 9:30am How do you fill? How hallway conversations built collaborations for the conservation of wooden objects
Speaker(s): Anne-Stephanie Etienne

9:30am – 10:00am In Between the Layers: Technical Study of a Contemporary Vietnamese Lacquer Painting
Speaker(s): Vu Do

10:00am – 10:30am **Morning Break in the Exhibit Hall**

10:30am – 11:00am Re-define the craquelure patterns on traditional Chinese musical instrument guqin with advanced imaging techniques RTI and micro-CT
Speaker(s): Aidi Bao

11:00am – 11:30am Furthering Conservation in Wartime Ukraine
Speaker(s): Yuri Yanchyshyn

CONCURRENT GENERAL SESSIONS

There are 12 concurrent sessions; 6 topics run from 2:00pm to 3:30pm and the other 6 topics run from 4:00pm to 5:30pm. The topic is listed first, then the presentation title, location, and speakers. See page 44 for a chart version.

2:00pm – 2:05pm We're All in This Together: Conservation Outreach and Community Engagement: Introduction and Session Sponsor Remarks by Propagroup S.p.A.
Nicollet C-D
Sponsors: Propadyn Museart

2:00pm – 2:10pm Leading the Way: Conservation Strategies in Museum Redevelopment: Introduction by Session Chair Vanessa Applebaum and Session Sponsor Remarks by Tru Vue
Regency Room

2:00pm – 2:10pm Lighting the Way: Museum Illumination Policies and MIcroFade Testing Introduction
Nicollet A-B

2:00pm – 2:30pm Capturing Complexity: Addressing Imaging Challenges through Collaboration: A Partnership Between The City Palace Museum in Udaipur and The Metropolitan Museum of Art in New York: The Joint Study of Mewar Paintings Through Multiband Imaging
Northstar A
Speaker(s): Marina Ruiz Molina, Bhasha Shah

2:00pm – 2:30pm Collaboration in Conservation Education: A Broad Brush Approach to Learning: Preserving Community Heritage
Mirage Room
Speaker(s): Devon Lee, Halina Piasecki

2:00pm – 2:30pm
Conservation in Times of Historical Conflict
Conservation, site preservation, and civil war at the UNESCO World Heritage Site of Jebel Barkal, Sudan: lessons from work during armed conflict
Lakeshore B-C
Speaker(s): Suzanne Davis

2:05pm – 2:15pm
We're All in This Together: Conservation Outreach and Community Engagement
Teacher/Conservator Co-Creation: Lessons in K-12 Outreach at the Conservation Center for Art and Historic Artifacts
Nicollet C-D
Speaker(s): Greg Stuart

2:10pm – 2:35pm
Leading the Way: Conservation Strategies in Museum Redevelopment
Let there be light: reintroducing natural light with mixed displays at the National Portrait Gallery London
Regency Room
Speaker(s): Alexandra Gent, Emmanuelle Largeteau

2:10pm – 2:35pm
Lighting the Way: Museum Illumination Policies and MIcroFade Testing: Sustainability-based decision making for museum lighting
Nicollet A-B
Speaker(s): David Saunders

2:15pm – 2:25pm
We're All in This Together: Conservation Outreach and Community Engagement: Letters to a Pre-Scientist: Accessible and Inclusive K-12 Outreach for Every Conservator
Nicollet C-D
Speaker(s): Ella Andrews

2:25pm – 2:35pm
We're All in This Together: Conservation Outreach and Community Engagement: Community-Led Preservation: Our Stuff, Our Stories at the Conservation Center for Art & Historic Artifacts
Nicollet C-D
Speaker(s): Katie Lowe, Greg Stuart

2:30pm – 3:00pm
Capturing Complexity: Addressing Imaging Challenges through Collaboration
Photogrammetry Fast: Developing a New Automated Pipeline.
Northstar A
Speaker(s): Kea Johnston

2:30pm – 3:00pm
Collaboration in Conservation Education
Strategies for Accessible and Collaborative Training in Indigenous Collections Care
Mirage Room
Speaker(s): Ellen Pearlstein, Justine Wuebold

2:30pm – 3:00pm
Conservation in Times of Historical Conflict
Wooden Churches in Wartime Ukraine: Conservation Challenges
Lakeshore B-C
Speaker(s): Ihor Bokalo, Mariana Kaplinska

2:35pm – 2:45pm
We're All in This Together: Conservation Outreach and Community Engagement: Establishing a Conservation Outreach Position at the Smithsonian National Museum of Asian Art
Nicollet C-D
Speaker(s): Sarah Rontal

2:35pm – 3:00pm
Leading the Way: Conservation Strategies in Museum Redevelopment
"If you build it, they will come": Building a Climate-Controlled Storage Unite Inside a 1940s Warehouse on a Navy Base
Regency Room
Speaker(s): Meghan Rathbun, Maria Vazquez

2:35pm – 3:00pm
Lighting the Way: Museum Illumination Policies and MIcroFade Testing
Illumination and Remembrance: Lighting Practices at the National September 11 Memorial & Museum
Nicollet A-B
Speaker(s): Kate Fugett, Kerith Koss Schrager, Andy Wolf

2:45pm – 3:00pm
We're All in This Together: Conservation Outreach and Community Engagement
The Stories We Keep: Conservation as the bridge to connect visitors, staff and the Carnegie Museum of Natural History's collections.
Nicollet C-D
Speaker(s): Annick Vuissoz

3:00pm – 3:10pm
We're All in This Together: Conservation Outreach and Community Engagement
(Un)Concealed Layers: design + public reception of a technical analysis exhibition
Nicollet C-D
Speaker(s): Courtney Books

3:00pm – 3:15pm
Collaboration in Conservation Education
Teaching and Networking as a Strategy for the Preventive Conservation of Cultural and Scientific Heritage at the University of São Paulo and in Brazil
Mirage Room
Speaker(s): Ina Hergert, Juliana Saft

3:00pm – 3:30pm
Capturing Complexity: Addressing Imaging Challenges through Collaboration
The Challenge of Chemical Reagents:The Verona Gaius and Vergil Palimpsests at the Confluence of Technologies
Northstar A
Speaker(s): Gregory Heyworth

3:00pm – 3:30pm Leading the Way: Conservation Strategies in Museum Redevelopment: Hundreds of objects, very few of us: treatment, prioritization, and teamwork during the Yale Peabody Museum renovation
Regency Room
Speaker(s): Mariana Di Giacomo

3:00pm – 3:30pm Lighting the Way: Museum Illumination Policies and MIcroFade Testing
Illuminating Acceptable Change: Collaborative, Data-Driven Lighting Guidelines
Nicollet A-B
Speaker(s): Patricia Silence

3:15pm – 3:30pm Collaboration in Conservation Education: Enhancing Diversity in Conservation through Collaboration at the World's Largest Consortium of HBCUs
Mirage Room
Speaker(s): Shannon Kimbro

3:30pm – 4:00pm Afternoon Break in the Exhibit Hall and Poster Q&A

4:00pm – 4:05pm Inside Out: Rewriting the Power Dynamics in Conservation: Introduction
Mirage Room

4:00pm – 4:10pm Elements of Effective Collaboration: Introduction and Session Sponsor Remarks by Click Netherfield
Nicollet C-D

4:00pm – 4:15pm Digitization and Open Access to Conservation Research and Technical Images: Introduction
Northstar A
Speaker(s): Lisa Schermerhorn

4:00pm – 4:15pm Prioritizing People Over Objects: Re-imagining Conservation Ethics Introduction
Regency Room

4:00pm – 4:20pm Documenting Reactivations: Between Materials & Sensory Experiences and Interactions: Jordan Wolfson's Body Sculpture: Transferring skills and documenting robots at the National Gallery of Australia
Lakeshore B-C
Speaker(s): Paul Coleman

4:00pm – 4:30pm Context-Based Practice: Conservation Field Services: Embedding Community Conservators in Public Libraries: Conservation as a Public Service
Nicollet A-B
Speaker(s): Joelle Wickens

4:05pm – 4:20pm Inside Out: Rewriting the Power Dynamics in Conservation: NEW Conservation Leadership Program with a Foundation in Cultural Equity
Mirage Room
Speaker(s): Sarah Kleiner

4:10pm – 4:30pm Elements of Effective Collaboration
Building Bridges: Reflections from a Collaborative Conservation Project
Nicollet C-D
Speaker(s): Katy Kaspari, Megan E. Salas

4:15pm – 4:30pm Prioritizing People Over Objects: Re-imagining Conservation Ethics: Darning the Wear of Time in the 21st Century: Redefining the Art Historical Narrative and the Role of the Textile Conservator
Regency Room
Speaker(s): Marissa Stevenson

4:15pm – 4:35pm Digitization and Open Access to Conservation Research and Technical Images: Publishing Technical Material on a Museum Website: The Early Netherlandish Paintings at The Met as a Case Study
Northstar A
Speaker(s): Sophie Scully

4:20pm – 4:40pm Documenting Reactivations: Between Materials & Sensory Experiences and Interactions
A Touchy Subject: Advancing Tactile Accessibility for Everyone Lakeshore B-C
Speaker(s): Jessica Chloros

4:20pm – 4:40pm Inside Out: Rewriting the Power Dynamics in Conservation: Managing change - Leadership in conservation and science for a new era Mirage Room
Speaker(s): Francesca Casadio

4:30pm – 4:50pm Elements of Effective Collaboration: Thirty Sailors Walk into a Museum: A Story of Collaboration Between Collections Professionals and a US Naval Nuclear Submarine Crew
Nicollet C-D
Speaker(s): Alyssa C. Opishinski, Brendan G Perry

4:30pm – 4:55pm Prioritizing People Over Objects: Re-imagining Conservation Ethics: Resonating Change through Collections Stewardship: The Creation of the Indigenous Collections Care (ICC) Guide
Regency Room
Speaker(s): Laura Elliff Cruz, Angela Neller

4:30pm – 5:00pm Context-Based Practice: Conservation Field Services: A Field Services Guide to Emergency Response
Nicollet A-B
Speaker(s): Todd Mahon, Megan Brakob Narvey

4:35pm – 4:55pm Digitization and Open Access to Conservation Research and Technical Images: Developing a Legacy of Open Access, Digital Catalogs at the Indianapolis Museum of Art
Northstar A
Speaker(s): Alex Chipkin, Roxane Sperber

4:40pm – 4:50pm
Inside Out: Rewriting the Power Dynamics in Conservation: Empowering Black Preservation: A Collaboration of Community, Conservation, and Construction at Mt Zion Baptist Church in Athens, Ohio
Mirage Room
Speaker(s): Ariana Makau

4:40pm – 5:00pm
Documenting Reactivations: Between Materials & Sensory Experiences and Interactions
Future lives: Collaborative approaches to the Conservation of Choreographic Artworks
Lakeshore B-C
Speaker(s): Rochelle Haley, Louise Lawson

4:50pm – 5:00pm
Inside Out: Rewriting the Power Dynamics in Conservation
Your Neighborhood Museum: creating a workspace for sustainable community-led cultural heritage preservation models
Mirage Room
Speaker(s): Jennifer Kim, Lylliam Posadas

4:50pm – 5:10pm
Elements of Effective Collaboration: Supporting Our Communities On the Edge: Community-led conservation in the midst of the climate crisis
Nicollet C-D
Speaker(s): Monica Shah

4:55pm – 5:15pm
Digitization and Open Access to Conservation Research and Technical Images: From Shared Mission to Shared Resources: The Joint Design and Development of the Samuel H. Kress Foundation and NYU Kress Conservation Websites
Northstar A
Speaker(s): Shan Kuang, Dianne Modestini

4:55pm – 5:15pm
Prioritizing People Over Objects: Re-imagining Conservation Ethics: Traditional Care and Western Care – A "Kinship" Approach to Collections Care
Regency Room
Speaker(s): Pejuta Haka Win Red Eagle

5:00pm – 5:20pm
Documenting Reactivations: Between Materials & Sensory Experiences and Interactions: Visceral Adipose Tissue: Overcoming Boundaries for the Presentation and Preservation of 2000-04-11 by Gu Dexin
Lakeshore B-C
Speaker(s): Alessandra Guarascio, Sara Moy

5:00pm – 5:30pm
Context-Based Practice: Conservation Field Services
Acts of Commemoration: When Narrative Precedes Material Context at the National September 11 Memorial & Museum
Nicollet A-B
Speaker(s): Kerith Koss Schrager, Andy Wolf

5:10pm – 5:20pm
Inside Out: Rewriting the Power Dynamics in Conservation: Community-Inclusive Public Art Conservation: Inner Resources Mural Conservation Apprenticeship Project
Mirage Room
Speaker(s): Jennifer Payan, Bianca Ramirez, Laleña Vellanoweth

5:10pm – 5:30pm
Elements of Effective Collaboration: A Focused and Critical Look at Collaborative Relationships at the National Museum of the American Indian
Nicollet C-D
Speaker(s): Beth Holford, Caitlin Mahony

5:15pm – 5:30pm
Prioritizing People Over Objects: Re-imagining Conservation Ethics
To Box or Not to Box that is the question of Being Boxed in - The Designing Process of Culturally Sensitive Containers
Regency Room
Speaker(s): Jo Lynne

5:15pm – 6:00pm
Digitization and Open Access to Conservation Research and Technical Images Panel Discussion
Northstar A

5:20pm – 6:00pm
Documenting Reactivations: Between Materials & Sensory Experiences and Interactions Panel Discussion
Lakeshore B-C

5:20pm – 6:00pm
Inside Out: Rewriting the Power Dynamics in Conservation Lightning Round Q&A and Panel Discussion
Mirage Room

5:30pm – 6:00pm
Context-Based Practice: Conservation Field Services Q&A and Panel discussion
Nicollet A-B

5:30pm – 6:00pm
Elements of Effective Collaboration) Panel Discussion
Nicollet C-D

5:30pm – 6:00pm
Prioritizing People Over Objects: Re-imagining Conservation Ethics Panel Q/A and Discussion
Regency Room

NOTE: See Concurrent sessions by track on the following pages.

DINNER/RECEPTION

6:15pm – 8:45pm
Dinner at Owamni
(420 S. 1st St)

7:30pm – 10:15pm
Drag After Party - VIP package includes light dinner and the early show- $39-75
Roxy's Cabaret (1333 Nicollet Mall)

CONCURRENT GENERAL SESSIONS BY TRACK

NORTHSTAR A

2:00pm – 3:30pm Capturing Complexity: Addressing Imaging Challenges through Collaboration

- A Partnership Between The City Palace Museum in Udaipur and The Metropolitan Museum of Art in New York: The Joint Study of Mewar Paintings Through Multiband Imaging, Marina Ruiz Molina, Bhasha Shah
- Imaging Challenges through Collaboration) Photogrammetry Fast: Developing a New Automated Pipeline, Kea Johnston
- The Challenge of Chemical Reagents:The Verona Gaius and Vergil Palimpsests at the Confluence of Technologies, Gregory Heyworth

4:00pm – 6:00pm Digitization and Open Access to Conservation Research and Technical Images

- From Shared Mission to Shared Resources: The Joint Design and Development of the Samuel H. Kress Foundation and NYU Kress Conservation Websites, Shan Kuang, Dianne Modestini
- Developing a Legacy of Open Access, Digital Catalogs at the Indianapolis Museum of Art, Roxane Sperber, Alex Chipkin
- Material on a Museum Website: The Early Netherlandish Paintings at The Met as a Case Study, Sophie Scully
- Panel Discussion

MIRAGE

2:00pm – 3:30pm Collaboration in Conservation Education

- A Broad Brush Approach to Learning: Preserving Community Heritage, Devon Lee, Halina Piasecki
- Strategies for Accessible and Collaborative Training in Indigenous Collections Care, Ellen Pearlstein, Justine Wuebold
- Teaching and Networking as a Strategy for the Preventive Conservation of Cultural and Scientific Heritage at the University of São Paulo and in Brazil, Juliana Saft, Ina Hergert
- Enhancing Diversity in Conservation through Collaboration at the World's Largest Consortium of HBCUs, Shannon Kimbro

4:00pm – 6:00pm Inside Out: Rewriting the Power Dynamics in Conservation

- NEW Conservation Leadership Collective with a Foundation in Cultural Equity, Sarah Kleiner
- Managing change - Leadership in conservation and science for a new era, Francesca Casadio
- Empowering Black Preservation: A Collaboration of Community, Conservation, and Construction at Mt Zion Baptist Church in Athens, Ohio, Ariana Makau
- Your Neighborhood Museum: creating a workspace for sustainable community-led cultural heritage preservation models, Lylliam Posadas, Jennifer Kim
- Community-Inclusive Public Art Conservation: Inner Resources Mural Conservation Apprenticeship Project, Jennifer Payan, Laleña Vellanoweth, Bianca Ramirez
- Lightning Round Q&A and Panel Discussion

NICOLLET A-B

2:00pm – 3:30pm Lighting the Way: Museum Illumination Policies and MicroFade Testing

- Sustainability-based decision making for museum lighting, David Saunders
- Illumination and Remembrance: Lighting Practices at the National September 11 Memorial & Museum, Kerith Koss Schrager, Andy Wolf, Kate Fugett
- Illuminating Acceptable Change: Collaborative, Data-Driven Lighting Guidelines, Patricia Silence

4:00pm – 6:00pm Elements of Effective Collaboration

- Building Bridges: Reflections from a Collaborative Conservation Project, Megan E. Salas, Katy Kaspari
- Thirty Sailors Walk into a Museum: A Story of Collaboration Between Collections Professionals and a US Naval Nuclear Submarine Crew, Alyssa C. Opishinski, Brendan G Perry
- Supporting Our Communities On the Edge: Community-led conservation in the midst of the climate crisis, Monica Shah
- A Focused and Critical Look at Collaborative Relationships at the National Museum of the American Indian, Beth Holford, Caitlin Mahony
- Panel Discussion

NICOLLET C-D

2:00pm – 3:30pm We're All in This Together: Conservation Outreach and Community Engagement

- Teacher/Conservator Co-Creation: Lessons in K-12 Outreach at the Conservation Center for Art and Historic Artifacts, Greg Stuart
- Letters to a Pre-Scientist: Accessible and Inclusive K-12 Outreach for Every Conservator, Ella Andrews
- Community-Led Preservation: Our Stuff, Our Stories at the Conservation Center for Art & Historic Artifacts, Greg Stuart, Katie Lowe
- Establishing a Conservation Outreach Position at the Smithsonian National Museum of Asian Art,Sarah Rontal
- The Stories We Keep: Conservation as the bridge to connect visitors, staff and the Carnegie Museum of Natural History's collections., Annick Vuissoz
- (Un)Concealed Layers: Design + public reception of a technical analysis exhibition, Courtney Books

4:00pm – 6:00pm Context-Based Practice: Conservation Field Services

- Embedding Community Conservators in Public Libraries: Conservation as a Public Service, Joelle Wickens
- A Field Services Guide to Emergency Response, Liz Koele, Todd Mahon
- Acts of Commemoration: When Narrative Precedes Material Context at the National September 11 Memorial & Museum, Kerith Koss Schrager, Andy Wolf
- Q&A and Panel discussion

CONCURRENT GENERAL SESSIONS BY TRACK

REGENCY ROOM

2:00pm – 3:30pm Leading the Way: Conservation Strategies in Museum Redevelopment

- Let there be light: reintroducing natural light with mixed displays at the National Portrait Gallery London,Alexandra Gent, Emmanuelle Largeteau
- "If you build it, they will come": Building a Climate-Controlled Storage Unite Inside a 1940s Warehouse on a Navy Base, Meghan Rathbun, Maria Vazquez
- Hundreds of Objects, Very Few of Us: Treatment, Prioritization, and Teamwork During the Yale Peabody Museum Renovation, Mariana Di Giacomo

4:00pm – 6:00pm Prioritizing People Over Objects: Re-imagining Conservation Ethics

- Darning the Wear of Time in the 21st Century: Redefining the Art Historical Narrative and the Role of the Textile Conservator, Marissa Stevenson
- Resonating Change through Collections Stewardship: The Creation of the Indigenous Collections Care (ICC) Guide, Angela Neller, Laura Elliff Cruz
- Traditional Care and Western Care – A "Kinship" Approach to Collections Care, Pejuta Haka Win Red Eagle
- To Box or Not to Box that is the question of Being Boxed in - The Designing Process of Culturally Sensitive Containers, Jo Lynne
- Panel Q/A and Discussion

LAKESHORE B-C

2:00pm – 3:30pm Conservation in Times of Historical Conflict

- Conservation, site preservation, and civil war at the UNESCO World Heritage Site of Jebel Barkal, Sudan: lessons from work during armed conflic, Suzanne Davis
- Wooden Churches in Wartime Ukraine: Conservation Challenge, Mariana Kaplinska, Ihor Bokalo

4:00pm – 6:00pm Documenting Reactivations: Between Materials & Sensory Experiences and Interactions

- Jordan Wolfson's Body Sculpture: Transferring skills and documenting robots at the National Gallery of Australia, Paul Coleman
- A Touchy Subject: Advancing Tactile Accessibility for Everyone, Jessica Chloros
- Future lives: Collaborative approaches to the Conservation of Choreographic Artworks, Louise Lawson, Rochelle Haley
- Visceral Adipose Tissue: Overcoming Boundaries for the Presentation and Preservation of 2000-04-11 by Gu Dexin, Alessandra Guarascio, Sara Moy
- Panel Discussion

MAY 31 SATURDAY

STUMBLING TOWARDS SUSTAINABILITY: STORIES ABOUT IMPLEMENTATION - NICOLLET B-D

8:15am – 8:30am Introduction

8:30am – 8:50am Getting on the Same Page at NYPL: Learning Together to Advance Climate Action in Preservation and Exhibition Contexts
Speaker(s): Colleen Grant

8:50am – 9:10am Sustainability across the collection multiverse
Speaker(s): Christopher Cameron

9:10am – 9:30am Sustainable Practices within Collection Care: Balancing Environmental Conditions with Institutional Demands
Speaker(s): Jackie Coppen

9:30am – 10:20am Panel Discussion

LUNCH SESSIONS - $35

12:00pm – 2:00pm Paintings Conservation Tips Luncheon
Northstar B

12:00pm – 2:00pm Socratic dialogue: What makes an object (in) valuable enough to conserve and preserve?
Greenway A-J

12:00pm – 2:00pm Sustainability in Collections Care: Centering on Context vs. Extending an Object's Physical Life
Greenway B-E
Speaker(s): Jane Henderson, Jessica Walthew, Joelle Wickens, Pejuta Haka Win Red Eagle
Sponsors: Conserv, DriSteem

ARCHAEOLOGICAL HERITAGE - LAKESHORE A

10:30am – 11:00am From Ashes to Artifacts: the strategic recovery of collections from the Montpelier fire
Speaker(s): Arianna Johnston

11:00am – 11:30am Heritage West | Archaeology, Conservation, and Community in West Philadelphia
Speaker(s): Michaela Paulson

11:30am – 12:00pm Hazy and Fragmented Memories: Revitalizing Two Archaeological Glass Carboy Bottles
Speaker(s): Yuyin (Charlotte) Li

2:00pm – 2:30pm When Conservation Goes For a Spin: Experiences gained and lessons learning from ten years of lifting and rotating large archaeological objects at the Mariners' Museum and Park
Speaker(s): William Hoffman

2:30pm – 3:00pm A Treatment Odyssey: The Preparation of 201 Ancient Cypriot Objects for Permanent Display
Speaker(s): Emily E. Brown, Tara Johnston

3:00pm – 3:30pm Setting Up Shop: Objects Conservation and Materials Analysis at Pañamarca, Peru
Speaker(s): Megan E. Salas

3:30pm – 3:45pm Forging Ahead: Creosote Removal from the Valley Forge National Park Upper Forge Site
Speaker(s): Hannah Sanner

ARCHITECTURE - LAKESHORE B-C

10:30am – 11:00am Proposing an Alternative Methodology for Hurricane-Related Vulnerability Assessments of Built Heritage in Puerto Rico
Speaker(s): Andrés Santana-Miranda

11:00am – 11:30am Colored Expectations, Whitewashed Reality: A.J. Downing's Influence and the Surprising Palette of Ivy Lodge
Speaker(s): Nicola Macdonald

11:30am – 12:00pm Importance of Planning, Research, and Material Testing in Maintaining an Oldest Public Wood-and-Glass Greenhouse in the United States
Speaker(s): Mayank Patel

2:00pm – 3:30pm Panel on Laser Cleaning on Masonry Materials, Lessons Learned
Speaker(s): Holly Salmon, Kelly Caldwell, Adam Jenkins, Judy Jacob, Walter Kesaris

BOOK AND PAPER (LADG) - MIRAGE ROOM

10:30am – 12:00pm Library and Archives Discussion Group - Managing Existing Mold on Library and Archives Collections
Speaker(s): Clara Huisman, Marieka Kaye

BOOK AND PAPER (APDG) - NICOLLET A

10:30am – 12:00pm Art on Paper Discussion Group - Citrates in Paper Conservation
Moderators: Meredith French, Amy Hughes
Speaker(s): Sarah Bertalan, Crystal Maitland

BOOK AND PAPER - NICOLLET A

2:00pm – 2:30pm Adhesive Kinetics: the Folding Endurance of Wheat Starch Paste, Cellulose Ethers, and Photo-Grade
Speaker(s): Catherine E. Stephens

2:30pm – 3:00pm Evaluating the effectiveness of alum-tawed parchment as a repair material
Speaker(s): Gwen dePolo, Kathryn Kenney

3:00pm – 3:30pm Reconsidering Klucel M: A Comparative Study of Commonly Used Cellulose Ethers in Paper Conservation
Speaker(s): Grace Walters

3:30pm – 4:00pm Book and Paper Tips Session

CONTEMPORARY ART + ELECTRONIC MEDIA - GREENWAY H-I

10:30am – 11:00am Branching Out: Conservation of Nam June Paik's Who's Your Tree at the Indianapolis Museum of Art
Speaker(s): Allison Slenker

11:00am – 11:30am Collaborative Voices: Preserving Alan Rath's Electronic Legacy Through Shared Knowledge
Speaker(s): Elisse Brautigam

11:30am – 12:00pm Meet RALPH: The Reliable, Archival, Longterm Preservation Helper
Speaker(s): Cass Fino-Radin

2:00pm – 2:30pm Balancing Aesthetics and Functionality: a continuous refinement to care for design objects
Speaker(s): Shu-Wen Lin, Chantal Willi

2:30pm – 3:00pm Exploring 3D Documentation for Time-based Media artworks: Case Studies from the Smithsonian Institution
Speaker(s): Ana Gabriela Calderon Puente

3:00pm – 3:30pm Teams of Care: Transfer Data Trust and the Case for Networked Artist Studios
Speaker(s): Regina Harsanyi, Kelani Nichole

OBJECTS - NICOLLET B-D

10:30am – 11:00am When Art Meets Engineering: Collaborative Approaches to Outdoor Sculpture Installations at the Toledo Museum of Art
Speakers: Emily Cummins

11:00am – 11:30am My Kingdom for a Drain: The Collaborative Treatment of Robert Gober's Untitled Installation
Speakers: Stephanie Cashman

11:30am – 12:00pm Collaboration on Restoring Henry Moore's Bronze Form at the Getty Museum
Speakers: Julie Wolfe

OBJECTS - MIRAGE

2:00pm – 4:00pm Mercury: A Collection Component - A Panel Discussion
Speakers: Kerith Koss Schrager, Lisa Goldberg

PAINTINGS + WOODEN ARTIFACTS - NORTHSTAR A

10:30am – 11:00am Painting on a Ply: Exploring Innovative Treatments and Funding Solutions
Speaker(s): Bianca Garcia, Morgan Wylder

11:00am – 11:30am Just Like the Real Thing: Jules Allard et Fils Reproduction Boiserie Period Rooms at the John & Mable Ringling Museum of Art
Speaker(s): Brooke Russell

11:30am – 12:00pm Early case studies in the use of Xanthan-Konjac/Agar physical hydrogels and their analogs for conservation cleaning
Speaker(s): Matthew Cushman

2:00pm – 2:30pm The First Hundred Years of Masonite
Speaker(s): M. Alan Miller

2:30pm – 3:00pm Collaborative conservation of a monumental altarpiece: Vivarini's Virgin and Dead Christ with the Ascension and Saints
Speaker(s): Abigail Hykin, Erin Mysak

3:00pm – 3:30pm X-ray Dendro: DIY CT Tree Ring Measurement for Dating Wooden Panels
Speaker(s): Francien Bossema, Arlen Heginbotham

3:30pm – 4:00pm Collaboration past and present: the collective investigation and treatment of the Saint John the Baptist altarpiece from the workshop of Blasco de Grañén
Speaker(s): Molly Hughes-Hallett

PREVENTIVE CARE + RESEARCH & TECHNICAL STUDIES + MFT-IDG - REGENCY ROOM

10:30am – 11:00am Lighting Policy as an iterative process with MFT
Speaker(s): Hebe Halstead

11:00am – 11:30am Shades of yellow: can MFT foretell light-induced color change of white paper?
Speaker(s): Marie Kern

11:30am – 12:00pm Low Dose Microfade Testing in Air and Low Oxygen Environments to Optimize Long-Term Display for the Emancipation Proclamation
Speaker(s): Lindsay Oakley

RESEARCH & TECHNICAL STUDIES - REGENCY ROOM

2:00pm – 2:30pm Joe Overstreet: searching for an unknown truth
Speaker(s): Corina Rogge, Silvia Russo

2:30pm – 3:00pm Secret Sauce: Investigating the Materials in Whistler's Nocturnes
Speaker(s): Georgina Rayner

3:00pm – 3:30pm The Chronology of a Painting - Le Déjeuner sur l'Herbe: Sketch, Copy or Replica
Speaker(s): Maureen Cross

3:30pm – 4:00pm Exploring the High-temperature Degradation of Athenian Red-figure Pottery Used in Cremation Burials
Speaker(s): Celia Chari, Nicole Ledoux

TEXTILES - GREENWAY F-G

10:30am – 11:00am You Had Me at Trello: Kanban Style Project Management in Conservation through Four Case Studies
Speaker(s): Emma Fritschel, Michelle Leung

11:00am – 11:30am WANTED: Cleaning Methods for Fugitive Early Synthetic Organic Acid Dyes on the Run
Speaker(s): Livi Andreini

11:30am – 11:45am Thutmose III Mummy Shroud from Storage to Display: Challenges and Collaborative Insights into Preservation and Exhibition
Speaker(s): Sarah Ismael, Enas Mohamed

2:00pm – 2:30pm Technical analysis of Anatolian Kilims: Bridging disciplines, departments and continents
Speaker(s): Callista Jerman

2:30pm – 3:00pm When UFOs invade: Displaying unfinished objects
Speaker(s): Gretchen Guidess, Jacquelyn Peterson-Grace

3:00pm – 4:00pm Textile Specialty Group Wiki Discussion

GENERAL CLOSING SESSION - NICOLLET B-D

4:00pm – 5:00pm AIC Member Business Meeting

5:00pm – 6:00pm 8th Annual Mistakes Session

VIRTUAL SESSIONS

All times are in CDT. Add one hour for Eastern Time and subtract two hours for Pacific Time. For example, in New York, you would begin watching on Thursday at 9:00am. In California, you would log in at 6:00am or tune in when you're ready to go back to watch the recordings of the early sessions.

LIVE-STREAMED SESSIONS (NOTE CENTRAL TIME ZONE)

May 28 • Wednesday

4:00pm – 6:30pm Keynote Addresses and Awards Presentation

May 29 • Thursday

Breaks at 10-11am and 3:30-4pm, lunch from 12-2pm

8:00am – 12:00pm Opening General Session

2:00pm – 5:00pm Architecture

2:00pm – 5:00pm Book and Paper

2:00pm – 5:30pm Contemporary Art

2:00pm – 5:00pm Electronic Media

2:00pm – 5:30pm Objects

2:00pm – 5:30pm Paintings

2:00pm – 5:30pm Photographic Materials

2:00pm – 5:30pm Preventive Care

2:00pm – 5:30pm Research & Technical Studies

2:00pm – 5:30pm Textiles

May 30 • Friday

Breaks at 10-10:30am and 3:30-4pm, lunch from 12-2pm

8:30am -12:00pm Morning Sessions

- » Architecture + Preventive Care
- » Book & Paper + Photographic Materials + RATS + Imaging
- » Contemporary Art + VoCA
- » Objects
- » Textiles
- » Wooden Artifacts
- » Paintings (9:00am start)
- » Electronic Media (10:30am start)

2:00pm -3:30pm Concurrent Sessions

- » Capturing Complexity
- » Conservation in Times of Conflict
- » Collaboration in Conservation Education
- » Leading the Way
- » Lighting the Way
  We're All in This Together

4:00pm – 5:30pm Concurrent Sessions

- » Digitization and Open Access
- » Documenting Reactivations
- » Rewriting Power Dynamics
- » Prioritizing People Over Objects
- » Context-Based Practice
- » Elements of Effective Collaboration

May 31 • Saturday

Lunch break from 12-2pm

8:15am – 10:20am Stumbling Towards Sustainability: Stories About Implementation

10:30am – 4:00pm Archaeological Heritage

10:30am – 3:30pm Architecture

10:30am – 4:00pm Contemporary Art + Electronic Media

10:30am – 4:00pm Objects

10:30am – 4:00pm Paintings + Wooden Artifacts

10:30am – 12:00pm Preventive Care + Research & Technical Studies + Microfading Testing

10:30am – 4:00pm Textiles

10:30am – 12:00pm BPG's Art on Paper Discussion

10:30am – 12:00pm BPG's Library & Archives Discussion

2:00pm – 4:00pm Book & Paper

2:00pm – 4:00pm Research & Technical Studies

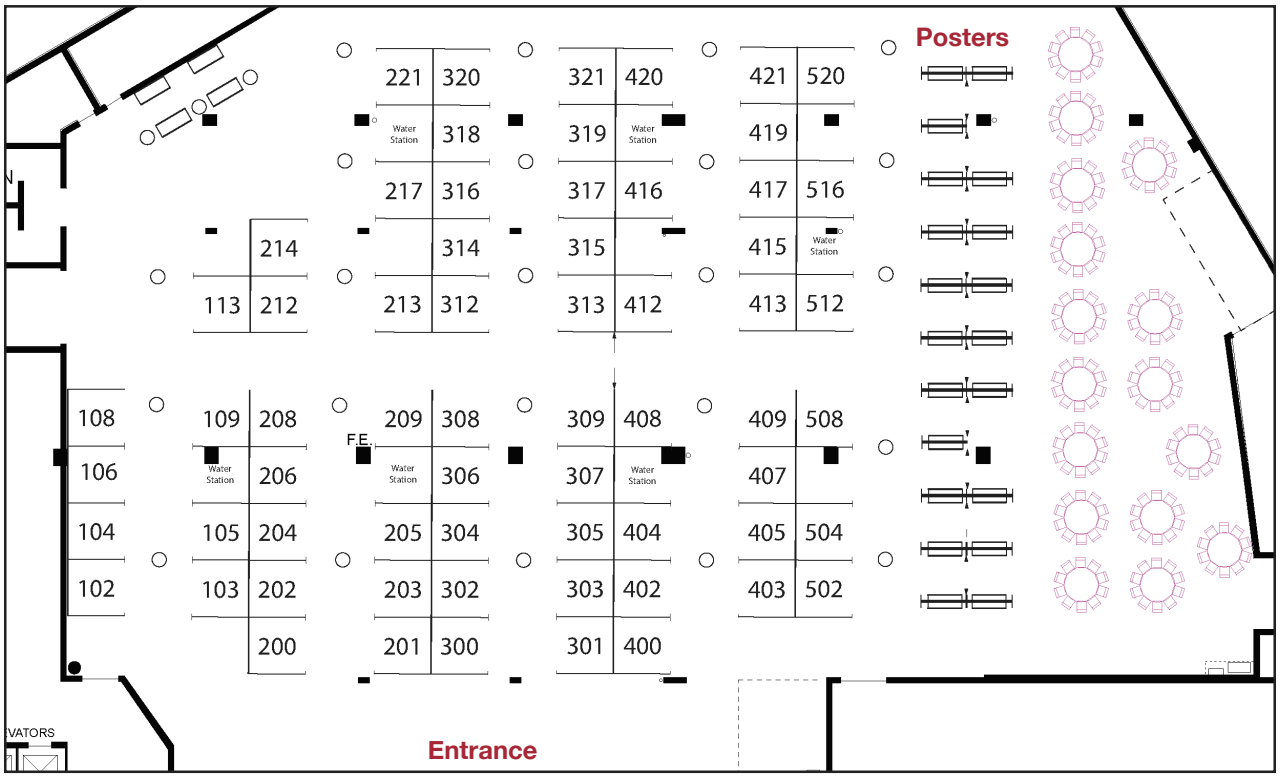
4:00pm – 5:00pm AIC Member Business Meeting

5:00pm – 6:00pm Closing Session: 8th Annual Mistakes

Luncheon Programming

Virtual attendees will have access to most of the luncheon programming (note the Socratic Dialogue will not be recorded) by June 1.

Exhibit Hall Directory



Exhibitor — Booth

EMERALD

Click Netherfield 400
Propadyn Museart 403
Tru Vue, Inc. 301
University Products, Inc. 200-203

DIAMOND

Getty Conservation Institute 213
Huntington T. Block Insurance Agency, Inc. 300

GOLD

Bruker 303
Conserv 102
DRI-STEEM Corporation 103
EXPM - Keeping History Alive 312-314
G.C. Laser Systems Inc. 202
Hollinger Metal Edge, Inc. 307
Kremer Pigments Inc. 302
Northeast Document Conservation Center (NEDCC) 201
Opus Instruments Ltd (Atik Cameras) 415
T and D US, LLC 304
Testfabrics, Inc. 315

SILVER

SmallCorp 309

REGULAR

American Academy of Bookbinding 205
Applied Surface Technologies 306
Archival Products 512
ArtFit 3D 419
Artist Engineering 416

Exhibitor — Booth

Bev/Art 405
Collector Systems 408
D/2 Biological Solution, Inc. 502
Delta Designs Ltd. 305
Dorfman Museum Figures, Inc. 313
FH Conservation Technology Ltd. 409
Foster+Freeman USA 508
Getty Publications 212-214
GLASBAU HAHN America 321
Hiromi Paper, Inc. 308
Instytut Fotonowy 412
John Canning & Co., Ltd 516
Masterpak 204
MegaVision, Ltd. 104
\Middleton Spectral Vision 520
MuseuM Services Corporation 504
National Center for Preservation Technology and Training (NCPTT) 417
Oliver Brothers LLC 404
OTEGO 320
Polygon US Corporation 221
RH Conservation Engineering 420
Spacesaver Corporation 402
Talas 407
Vaisala 413
X-RIS USA Inc. 209
Zone Display Cases 421

AIC AND FAIC

AIC/FAIC 105
AIC Health & Safety Network 109
AIC Sustainability Committee 208

Exhibitor Profiles

Our Exhibit Hall will be open Wednesday night through Friday, May 28-30. Join us Wednesday 6:30pm-8:30pm, and Thursday and Friday from 10:00am–5:30pm. The booths, seating, and posters are located in Hyatt's Exhibit Hall on the Main Level.

Visit posters and enjoy refreshments while you peruse our vendors' offerings during session breaks on Thursday and Friday at 10:00am and 3:30pm. Don't forget that you can visit the booths any time the Exhibit Hall is open! **Our Exhibit Hall Opening Reception is Wednesday, 6:30 to 8:30pm. Make sure to stop by the posters for Q&A on Friday at 3:30pm!**

EMERALD LEVEL

CLICK NETHERFIELD
Booth #400

1103 Laurel Oak Rd., Ste. 107, Voorhees, NJ 08043 USA
Contact: Ryan Skorch
Ph: +1 (856) 313-6688
Email: r.skorch@clicknetherfield.com
Website: www.clicknetherfield.com

We are Click Netherfield, global museum showcase experts with over 50 years experience working with institutions and communities from Royal Families and National Institutions, to Independent Galleries & Private Collectors. With roots in Scottish soil, and North American operations based in New Jersey, we are very proud to serve the Conservation Community, especially in our work with the Materials Working Group. Our doors & minds are always open, so if you 'Fancy a Chat' please do reach out. ***Sponsoring: Concurrent General Session Elements of Effective Collaboration.***

PROPADYN MUSEART
Booth #403

Via Genova 5/B, 10098 Rivoli, Turin, Italy
Contact: Davide Borla
Ph: +39 335 126 2227
Email: dborla@propagroup.com
Website: www.propagroup.com

THE ART OF PROTECTING ART. Propadyn Museart is an innovative dynamic humidity stabilizer to protect artworks in all situations: exhibitions, transport or conservation. Thanks to Propadyn Museart, the humidity in the air is stabilized by maintaining the desired level of relative humidity constant. Propadyn is the most advanced, safe and customizable solution for protecting valuable goods, especially artworks. ***Sponsoring: Concurrent General Session - We're All in This Together: Conservation Outreach and Community Engagement.***

TRU VUE, INC.
Booth #301

9400 West 55th St., McCook, IL 60525 USA
Contact: Carolyn Hays
Ph: +1 (708) 485-5080
Email: fineart@tru-vue.com
Website: tru-vue.com/exhibition-collections

For over 50 years, Tru Vue fine art acrylic & glass solutions, including Optium Museum Acrylic®, Conservation Clear® Acrylic, & UltraVue® Laminated Glass, have been trusted by conservation & fine art professionals worldwide to protect & display artworks & cultural heritage. We work closely with the museum community to develop products that meet superior aesthetic and conservation standards. For more information or samples visit our website or email fineart@tru-vue.com. ***Sponsoring: Concurrent General Session - Leading the Way: Conservation Strategies in Museum Redevelopment.***

UNIVERSITY PRODUCTS, INC.
Booth #200 and #203

517 Main Street, Holyoke, MA 01040 USA
Contact: John A. Dunphy
Ph: +1800-6298-1912 Fx:1 800-532-9281
Email: jadunphy@universityproducts.com
Website: www.universityproducts.com

University Products, the leading supplier of materials, tools, and equipment to conservation professionals, continues to add innovative new products to its line. Visit our booth and hear about our new product offerings, including the EX LIBRIS® Adjustable Textile Conservation Workstation for cleaning and treating large format textiles. And while they last, pick up your free bone folder. ***Sponsoring: Keynote and Awards Presentation.***

DIAMOND LEVEL

GETTY CONSERVATION INSTITUTE
Booth #213

1200 Getty Center Dr., Ste. 700, Los Angeles, CA 90049 USA
Contact: Lilibeth Garcia
Ph: +1 (310) 440-7325
Email: gciweb@getty.edu
Website: www.getty.edu/conservation

The Getty Conservation Institute works to advance conservation practice in the visual arts, broadly interpreted to include objects, collections, architecture, and sites. It serves the conservation community through scientific research, education and training, model field projects, and the broad dissemination of the results of both its own work and the work of others in the field. In all its endeavors, the Conservation Institute focuses on the creation and dissemination of knowledge that will benefit the professionals and organizations responsible for the conservation of the world's cultural heritage. ***Sponsoring: Emerging Conservation Professionals Happy Hour.***

HUNTINGTON T. BLOCK INSURANCE AGENCY, INC.

Booth #300

2001 K St., NW, Ste. 625, Washington, DC 20006 USA
Contact: Casey Wigglesworth
Ph: +1 (202) 429-8590
Email: casey.wigglesworth@huntingtontblock.com
Website: www.huntingtontblock.com

Huntington T. Block (HTB) Insurance Agency is a leading provider of fine arts and musical instrumentinsurance solutions. With specialized coverage, competitive pricing, and a consultative approach, HTB is dedicated to helping protect our clients' most valued treasures. ***Sponsoring: Concurrent General Session – Lighting the Way: Museum Illumination Policies and Microfade Testing and the Preventive Conservation Network Idea Fair.***

GOLD LEVEL

BRUKER

Booth #303

5465 East Cheryl Parkway, Madison, WI 53711 USA
Contact: Melanie Swanson
Ph: +1 (978) 663-3660, Email: melanie.swanson@bruker.com
Website: www.bruker.com

Bruker is one of the world's leading analytical instrumentation companies. We cover a broad spectrum of advanced solutions in all fields of research and development. Bruker's innovative methods and non-destructive analytical techniques help to protect and preserve artifacts and historical monuments all over the world. ***Sponsoring: Foundations of Spectral Imaging of Cultural Heritage Objects (Multiband, Multispectral and Hyperspectral Imaging) Luncheon.***

CONSERV

Booth #102

5600 9th Ave S., Birmingham, AL 35212 USA
Contact: Claire Winfield
Ph: +1 (314) 629-3152, Email: claire@conserv.io
Website: www.conserv.io

Conserv is not just a data logger company, we offer the first tailor-made system for collections care. Effortless data collection from purpose-built wireless sensors with intuitive data analysis made for preservation professionals including real-time alerts. Turn on Conserv environmental monitoring and it just works, but our expert support team is here to help should a problem arise. ***Sponsoring: Sustainability in Collections Care: Centering on Context vs. Extending an Object's Physical Life Luncheon.***

DRISTEEM

Booth #103

14949 Technology Drive, Eden Prairie, MN 55344 USA
Contact: Danielle Schlender
Ph: +1 (952) 949-2415
Email: Danielle.Schlender@dristeem.com
Website: www.dristeem.com

DriSteem is a premier provider of humidity control solutions, specializing in precise environmental control for museums and cultural institutions. Since 1965, we have been dedicated to protecting priceless artifacts, artwork, and historical collections by delivering customized humidity control systems that prevent deterioration caused by fluctuating relative humidity. Our focus on quality is evident in the superior construction of DriSteem products and in our exceptional service to customers. ***Sponsoring: Sustainability in Collections Care: Centering on Context vs. Extending an Object's Physical Life Luncheon.***

EXPM – KEEPING HISTORY ALIVE

Booth #312-314

350 Rua Fonte da Carreira Armazem A 10, Alcabideche, 2645-550 Lisboa, Portugal
Contact: Rui Mamede
Ph: +1 (351) 21 466 1910, Email: rmamede@expm.com.pt
Website: www.expm.com.pt

EXPM offers innovative collection care solutions, that empower museums, archives, and libraries to safeguard the treasures of our collective history and ensure they remain accessible for current and future generations. We offer an extensive range of services, including the setting-up of conservation labs and the provision of specialized equipment such as anoxia chambers. Our work is a testament to our passion for preserving the legacy of humanity, one artifact, one document, and one story at a time. ***Sponsoring: The Impact of the New Orleans Charter After 30 Years: Collections in Historic Buildings Luncheon.***

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Website: www.gclasers.com

Our unique patented laser systems are built in the USA and were originally designed for art and architecture conservation to offer unmatched precision, control, and efficiency for cleaning historic surfaces. Our environmentally friendly technology has been used to clean the 3,500-year-old Egyptian obelisk in New York, an exact replica of Michelangelo's David made from Carrara marble in Florida, and many public monuments and architectural structures worldwide such as the marble facade of the Supreme Court of the United States and the Jefferson Memorial. Our technology is specifically designed by conservators and engineers in the USA to safely clean a variety of surfaces without damaging the substrate. We have evolved from our origins in the art world to also manufacture a range of handheld and fully automated laser systems for industrial and commercial applications that require efficiency and precision. ***Sponsoring: Foundations of Spectral Imaging of Cultural Heritage Objects (Multiband, Multispectral and Hyperspectral Imaging) Luncheon.***

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Booth #307

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Website: www.hollingermetaledge.comHollinger Metal Edge, Inc. has been the leading supplier of archival storage products for Conservators, Museums, Government and Institutional Archives, Historical Societies, Libraries, Universities, Galleries and Private Collectors for over 65 years. Famous for The Hollinger Box – the metal edged gray document cases that fill the shelves of thousands of organizations, we offer a wide variety of box styles made with various appropriate materials to store any collectible. We also supply conservation materials, inert

polyester, polypropylene and Tyvek products, archival folders, buffered and unbuffered envelopes, Permalife bond papers, and buffered and unbuffered tissue paper. Hollinger Metal Edge manufactures custom orders on a daily basis and is committed to educational support for preservation workshops. Please contact us regarding your workshop, and we will provide free catalogs and samples as required. ***Sponsoring: Reception at Mill City Museum (ASG/BPG/PMG/TSG).***

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Booth #302

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Contact: Roger Carmona
Ph: +1 (212) 219-2394
Email: roger@kremerpigments.com
Website: www.kremerpigments.com

Kremer Pigments provides a wide array of raw materials catering to art and conservation needs, including historic and contemporary pigments, mediums, binders, dyes, vegetable-based color paints, oils, brushes, tools, linen, books, and much more. Discover a spectrum of possibilities as you unearth the forgotten treasures of the old masters with Kremer Pigments. ***Sponsoring: Paintings Specialty Group Happy Hour.***

NEDCC | NORTHEAST DOCUMENT CONSERVATION CENTER

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Contact: Tahe Zalal
Ph: +1 (978) 470-1010
Email: tzalal@nedcc.org
Website: www.nedcc.org

Founded in 1973, NEDCC is the first independent conservation laboratory in the United States to specialize exclusively in treating collections made of paper or parchment, such as works of art, photographs, books, maps, manuscripts, etc. NEDCC is incorporated as a nonprofit so as to provide affordable conservation and preservation services to collecting institutions. ***Sponsoring: Our Stories: Communicating Conservation when Presenting to a General Audience Luncheon.***

OPUS INSTRUMENTS LTD (ATIK CAMERAS, Unipessoal LDA)

Booth #415

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Contact: Eva Direito
Ph: +351 926 847721 and +351 210 868596
Email: eva.direito@atik-cameras.com
Website: www.opusinstruments.com

Opus Instruments is the world leading specialist in infrared reflectography (IRR), used in the fields of art conservation, restoration and provenance research. IRR is a non-invasive method of studying a painting by looking beneath the visible layers of paint. If you are looking to create detailed, high-quality, high-resolution infrared images, Apollo is the camera for you. Weighing at just 12 kilograms, the Apollo is both portable and accessible, ready to follow wherever the research takes you. ***Sponsoring: Reception at Mill City Museum (ASG/BPG/PMG/TSG)***.

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Contact: Steve Knuth
Ph: +1 (518) 669-9227
Email: steve.knuth@tandd.com
Website: www.tandd.com

T&D Corporation manufactures a complete line of network connected and stand-alone Data Loggers that are optimized for automated, error free data collection, remote monitoring and warning notification. T&D's products offer an extensive array of connectivity options including loggers with built-in network interfaces, wireless handheld data shuttles, network and cellular gateways, and even Bluetooth interfaces for direct connection to smart phones and tablets. Developed specifically for Museum and Archive applications, T&D produces 4 in 1 loggers that record Temperature, Humidity, Illuminance, and Ultra Violet light, that also maintain internal running exposure totals. T&D offers an exceptional value proposition to its customers through its completely free WebStorage Service. T&D Corporation, the world's leading supplier of wireless data loggers, is headquartered in Matsumoto Japan, and has been engaged in the design, development and manufacture of high reliability, high quality electronic measurement systems since 1986. ***Sponsoring: Specialty Group Interest Sessions (Book and Paper |Photographic Materials | RATS Imaging Session).***

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Booth #315

PO Box 3026, West Pittston, PA 18643
Contact: Normandy 'Mandy' Klaas
Ph: +1 (570) 603-0432
Email: mandy@testfabrics.com
Website: www.testfabrics.com

Testfabrics, Inc. is a worldwide supplier and producer of textile testing materials. While used primarily in quality assurance testing, our fabrics have found their way into countless other applications. We stock an inventory of "clean" fabrics, free of sizings, dyes, and finishes. Conservators and museum clients have been using Testfabrics as a resource for over forty years and are critical to our continued product development. We now stock Fosshape as well as a wide range of conservation friendly textiles and tools. Requests, questions, and feedback are always welcome and help us provide the conservation world with the best service possible. ***Sponsoring: Reception at Mill City Museum (ASG/BPG/PMG/TSG).***

SILVER LEVEL

SMALLCORP

Booth #309

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Contact: Michael Dunphy
Ph: +1 (413) 772-0889 Fx: +1 (413) 773-7386
Email: mike@smallcorp.com
Website: www.smallcorp.com

SmallCorp manufactures products for the display, conservation and storage of works of art, textiles and objects. Our frames and microclimate display cases figure prominently in museum and corporate collections. SmallCorp customers include picture framers, galleries, art conservators and collection care professionals, as well as a wide range of cultural heritage institutions.

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Ph: +1 (970) 728-8649
Email: chip@ahhaa.org
Website: www.bookbindingacademy.org

Founded in 1993, the American Academy of Bookbinding offers courses in fine binding and book and paper conservation. We offer two diploma programs: the Fine Binding Program, led by Don Glaister, and the Comprehensive Binding Program, led by Peter Geraty. The latter specializes in book conservation and restoration, as well as established practices for edition binding. Our students are both serious bookbinders and conservation professionals.

APPLIED SURFACE TECHNOLOGIES
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Contact: Robert Sherman
Ph: +1 (908) 464-6675
Email: roberts@co2clean.com
Website: www.appliedsurfacetech.com

We will demonstrate Carbon Dioxide Snow Cleaning as applied to cleaning and restoring art. We will demonstrate the CO2 Snow Cleaning units for cleaning different materials and items. CO2 snow can remove soot, hydrocarbon oils, fingerprints, dust, particles of all sizes, polishing residues and more. Examples shown include fingerprints from a shiny surface, polishing and wax residues, soot, ceramics, polymers, and more. We will also display a presentation given at the Boston Museum of Fine Arts.

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Contact: Bellamy Crozier
Ph: +1 (917) 714-1599
Email: engineer@artfit3d.com
Website: www.artfit3d.com

ArtFit 3D was founded by Bob Crozier, a leader in the safe handling, shipping, and storage of fine art, antiques, and culturally significant objects since establishing Crozier Fine Arts in 1976. His latest initiative is an innovative system designed to protect three-dimensional objects during shipping and long-term storage.

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Email: sam@artistengineering.co
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Email: bryan@bev.art
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Email: ekahan@collectorsystems.com
Website: www.collectorsystems.com

Collector Systems is a leading cloud-based collections management platform trusted by museums, libraries, archives, historic homes, and foundations. Designed for ease of use, our solution supports diverse collections across art, archaeology, history, and more. With robust cataloging, reporting, and a new powerful conservation, lighting, photography, and framing modules, we help institutions preserve and manage cultural heritage with the confidence and power you need.

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D/2 Biological Solutions, Inc., specializes in products designed to remove stains caused by mold, mildew, algae, lichens, and air pollutants. Our flagship product, D/2 Biological Solution, is a biodegradable liquid effective on various building materials such as masonry, marble, granite, limestone, and wood. D/2 was developed by conservators who know the damage that can be done by cleaners containing acid or

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FH Conservation is a manufacturer of professional equipment for cultural collection preservation. Our solutions are used by LAMs (libraries, archives and museums) to create safe air for different kinds of collections. We have served over 600 institutions over the past 20 years. Our featured products include restoration equipment with various functions, microclimate controllers, constant temperature and humidity cabinets, monitoring sensors, and other environmental control tools.

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Foster+Freeman is a forensic science innovation company specializing in the development and manufacture of forensic science equipment. Our products, such as advanced imaging systems and non-destructive analysis tools, are used by conservators to examine, visualize, and preserve valuable artifacts, artworks, and historical documents. With cutting-edge technology, Foster+Freeman supports conservation professionals in maintaining the integrity of cultural heritage while ensuring careful, precise examination and treatment.

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Instytut Fotonowy is located in Cracow, Poland. We have been designing and manufacturing scientific instrumentation since 2007. One of our primary strengths among various research specializations is microfading technique; we have designed a comprehensive system - Micro Fading Tester. The instrument with dedicated software automates time-consuming measurements, data processing, calculations and results presentation.

Our system provides data necessary to develop long-term heritage conservation policy based on lightfastness analysis. The degradation budget may be specified as a way balance preservation and exposition. The Micro Fading Tester is widely used and appreciated by research institutions around the world.

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For almost 50 years, John Canning & Company has taken immeasurable pride in dedicating itself to the historic restoration, conservation, and preservation. We are experts in ornamental plaster restoration, plaster stabilization, decorative finishes, gilding, artwork/murals, historic woodwork, and stone. Besides our trade services, we provide preconstruction, design, and planning services. Our reputation for professionalism, craftsmanship, unique preservation problem-solving capabilities, and high standards has allowed us to work in iconic buildings across the country.

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Masterpak supplies unique & archival materials for the protection of fine art, artifacts and antiques in packing, shipping, storing and display and hard-to-find materials for conservators, artists, museums, galleries, collectors, framers and art shippers. Products include: archival rolling and storage tubes, tissues, Softwrap Tyvek or Nomex and Hardwrap Tyvek Liners by DuPont, Ethafoam and Cellu-Cushion, Volara Foam, Dartek Cast Nylon Film, Marvelseal, poly sheeting, glassine paper, archival corrugated boards, Masterpak art shipping boxes, Oz clips, PEM2 data loggers, software for humidity & temperature tracking, and much more. All products are available in small or large quantities and ship within 24 hours.

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MegaVision's multispectral imaging systems are used to image, measure and monitor cultural heritage treasures in museums, libraries, and other institutions around the world. MegaVision introduced the first professional quality digital camera over 30 years ago and the first LED narrow-band multispectral light source for imaging cultural heritage treasures 15 years ago. MegaVision continues its legacy of imaging excellence providing the highest quality camera and multispectral lighting systems for the scientific, cultural heritage and medical industry.

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The National Park Service's National Center for Preservation Technology and Training protects America's historic legacy by equipping professionals in the field of historic preservation with progressive technology-based research and training. Since its founding in 1994, NCPTT has awarded over $7 million in grants for research that fulfills its mission of advancing the use of science and technology in the fields of archaeology, architecture, landscape architecture and materials conservation.

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Vaisala is a global leader in environmental measurement solutions offering a cloud-based monitoring system, Jade Smart Cloud, for Museums & Archives to preserve valuable artifacts. The system provides precise, wireless monitoring of humidity and temperature, independent of HVAC systems, facilitating easy relocation of sensors as exhibits change. It offers real-time data access and alerts, helping museums maintain optimal conditions to prevent damage and preserve cultural heritage.

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X-RIS (X-Ray Imaging Solutions) specializes in non-destructive testing, and more specifically, in digital radiography. We design and market X-ray generators and detectors, electromechanical equipment, advanced user-friendly software solutions, as well as standard and customized systems. A couple of years ago, we expanded into the art sector, providing custom-made solutions to museums like The London National Gallery and the Louvre.

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AIC COMMITTEE: SUSTAINABILITY

Booth #208

Contact: Yadin Larochette, Chair
Email: sustainability@culturalheritage.org
Website: www.culturalheritage.org/sustainability

The charge of the committee is to provide resources for AIC members and other caretakers of cultural heritage regarding environmentally sustainable approaches to preventive care and other aspects of conservation practice. They are also charged to define research topics and suggest working groups as needed to explore sustainable conservation practices and new technologies.

AIC NETWORK: HEALTH & SAFETY

Booth #109

Contact: Stephanie Black, Chair
Email: health-safety@culturalheritage.org
Website: www.culturalheritage.org/health

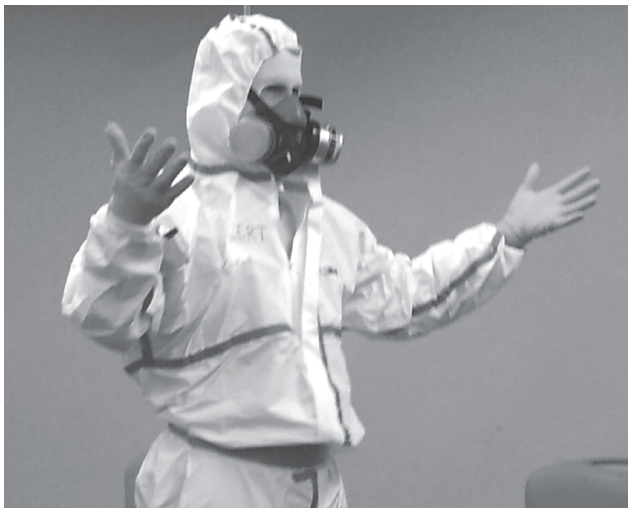
The Health & Safety Network provides educational and technical information to the AIC membership to increase knowledge of safety hazards and general health issues related to the conservation profession. It offers information through lectures, workshops, displays, AIC's publications, AIC's website, a new forum, and other electronic and print media. It also addresses health and safety issues of concern to the AIC membership by maintaining current information through research, by collaboration with health and safety professionals and with other health and safety organizations, and, periodically, by statistically valid surveys, the results of which facilitate establishing priorities. Join the Health & Safety Forum at www.culturalheritage.org/health-safety-forum to ask questions!

AIC & FAIC INFORMATION

Booth #105

Email: contact@culturalheritage.org
Website: www.culturalheritage.org

Stop by our booth and get to meet AIC & FAIC staff. Let's discuss how to get the most out of your membership and learn more about FAIC programs. Staff are also at the registration desk throughout the conference.



Proper safety garb demonstration from "Sustainability for the Conservator: Mold Remediation," at the H&S Session at the AIC 42nd Annual Meeting.

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POSTERS

Explore the posters in the Exhibit Hall to discover new research.

Read the poster abstracts to familiarize yourself with the topics, then meet the poster authors to discuss their research at their posters on **Friday, May 30, during the 3:30pm break**. Posters will be on view during all Exhibit Hall hours. Posters will be available online after the meeting; authors can submit their posters to aicposters@gmail.com. Poster abstracts are at https://2025postersession.sched.com/and in the abstracts section of this program

01. **Study and conservation of archaeological glass dish from the early Islamic era extracted from the excavations of the American Research Center in Fustat, Egypt**
Mohammad Abdelkarim

02. **The nanotechnology technique and its use in cleaning and consolidating the mural paintings**
Meriette Azmy

03. **An Overture of Past and Present Conservation Challenges: Straits Settlement Police Band Scores**
Sanira Karim Gani, Tay Jam Meng

04. **Bridging Preservation and Digitization: Collaborative Approaches in Remediating and Preparing Folk-Legacy Records for Long-term Access**
Dave Walker, Hannah Rose Baker, Authors: Hannah Rose Baker, Julia Hawkins, Caroline Mulligan, Dave Walker

05. **The Mysterious Flecto: Investigating a Historic Treatment Material**
Ainslie Harrison, Authors: Jennifer Bridges, Lindsay Cross, Ainslie Harrison, Skyler Jenkins, Leila Sabouni

06. **Book speaks volumes: Micro computed tomography of Mary Stuart's prayer book binding**
Anna Kowalewska

07. **Developing Conservator: My Journey in Darkroom Photography**
Sophie Church, Authors: Sophie Church, Theresa J. Smith

08. **Stuck on You: An Experiment in Separating Oil-based Printing Ink from Acrylic Glazing**
Frances Opferman, Authors: Frances Opferman, Samantha Sheesley

09. **Shedding Light on the Color Sensitivity of Glass Beads**
Devon Lee, Authors: Cheyenne Caraway, Ellen Carrlee, Devon Lee

10. **Can turning off air conditioning systems still keep museum collections safe?**
Wei-An Wu, Authors: Yan Chen Lin, Chien-Shan LU, Wei-An Wu

11. **The Application of Forensic Imaging Technology to the Field of Cultural Heritage using the Crime-lite® AUTO**
Lindsey Tyne, Minyoung Kim, Authors: Minyoung Kim, Jessica Pace, Lindsey Tyne

12. **Frederick Carder's Aurene Glass: Historic Background and Physical-Chemical Description**
Annika Blake-Howland, Authors: Annika Blake-Howland, Doris Möncke

13. **The Value of Rejection: Embracing Discarded Materials - Assessing the Potential of In-House Cellulose Nanofibers in Paper Conservation**
Hsuan-Yu Chen, Tsang-Chyi Shiah

14. **Innovating Cultural Heritage: Modified Smartphone Multispectral Imaging for the Pigment Analysis of Roman Egyptian Soter Shrouds**
Rachel Coderre, Sean Billups

15. **Pew! Pew! Testing A Novel Application of Neodymium-doped Yttrium Aluminum Garnet Lasers in Asphaltic Paleontological Preparation**
Stevie Morley, Authors: Stevie Morley, Vadim Parfenov, Stephany Potze

16. **(Re)constructing the Plaster Print: Tracing an Elusive History**
Emily Jenne, Authors: Lisa Conte, Lucia Elledge, Emily Jenne

17. **Considering Soy-mal-tan: a preliminary examination of a sustainable high-strength adhesive and its potential application to metals conservation**
Karl Knauer

18. **Blooming Solutions: Reviving Broken Plastics with 3D Printing**
Patricia Navedo Garcia

19. **Creating the Ripple Effect on Embroidery Research and Development Center's Collaboration with Science and Technology Museum in Taiwan**
Cheng-Chung Huang, Authors: Cheng-Chung Huang, Miao-Tzu Lin

20. **From Genesis to Revelation: The Restoration of Richmond Barthé's Exodus and Dance**
Helen M. Thomas-Haney, Kelly Caldwell, Authors: Kelly Caldwell, Katharine George, Helen M. Thomas-Haney

21. **Joining hands for heritage: Story of The City Palace Museum, Udaipur, India**
Bhasha Shah, Anuja Mukherjee

22. **Imitation of a turned horn roller using 3D technology**
Cynthia Schwarz, Authors: Rachel Heyse, Richard House, Cynthia Schwarz

23. **Will It Still Stick? Investigating Adhesive Suitability for the Consolidation of Steel Treated with Corrosion Inhibitor at the National September 11 Memorial & Museum**
Andy Wolf, Authors: Rebecca Rosen, Kerith Koss Schrager, Andy Wolf

24. **Anoxia Disinfestation of a Chocolate Sculpture: Collaborative approaches and technics**
Vânia Assis, Authors: Helena Abreu, Vânia Assis, Filipe Duarte

25. **[pulled]**

26. **Investigation into uses of silicone rubber for tarnish removal and metal polishing**
Megan Randall, Authors: Megan Randall, Olivia Thanadabout

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Sydney Andrea Landers, Authors: National Center for Preservation Technology (NCPTT), Brooke Derr, Marissa Donahue, Sydney Andrea Landers, Robert Page, Michael Stachowicz

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Speakers: Rita Berg, Authors: Alexa Beller, Rita Berg, Kristy Jeffcoat

29. **Seeing Past the Surface: The Research and Conservation of the Raclin Murphy Museum of Art's The Blessed Virgin Reading**
Alexa Beller

30. **Gossamer Paintings: A Web Connecting Paper, Textiles, and Paintings Conservators**
Lindsey Williams, Authors: Megan Creamer, Manuela Wiesend, Lindsey Williams

31. **From Fear to Familiarity: The Role of a 'Bug Bulletin' in Strengthening Integrated Pest Management**
Elise Etrheim

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33. **[pulled]**

34. **Together we rise: Introducing high school students to the conservation and museum fields through the Summer RISE program**
Austin Anderson

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Todd Holmberg

44. **Rethinking the Book Cradle: Addressing Efficiency and Functionality challenges with book handling**
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50. **Dinosaurs live on: The Story of a West Indian Microfilm Collection**
Dunstan Newman, Authors: Nicole Lewis-Prawl, Dunstan Newman, Bernadette Worrell-Johnson

51. **From Historical Practices to Modern Solutions: A Material Science Review for In-situ Underwater Cultural Heritage Conservation**
Chongwen Liu

52. **Collaborative Techniques in the Preservation of Saad Zaghloul Pasha's Photographic Archive**
Rasha Shaheen

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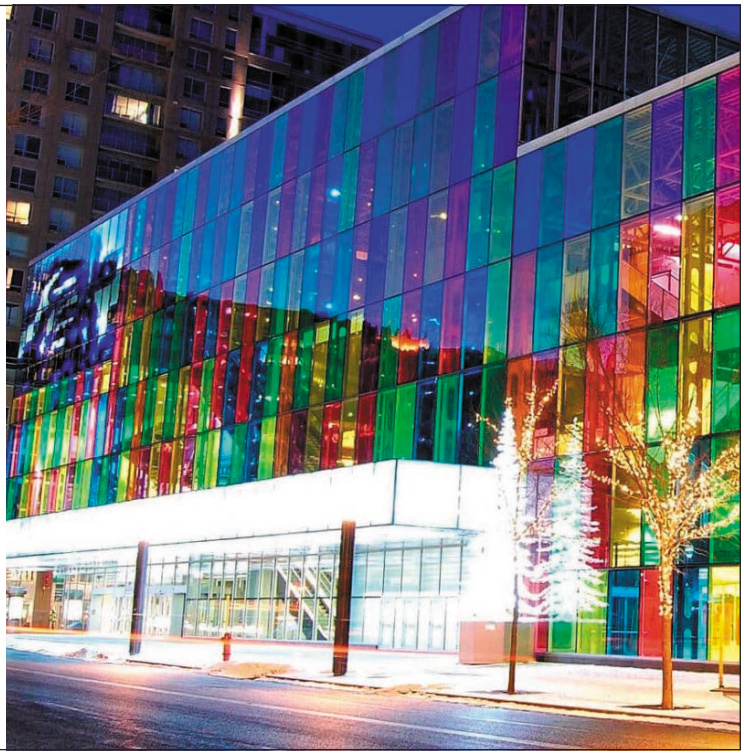
Meet us in Montreal!

Conservation at the Intersection of Innovation and Tradition

The 54th AIC Annual Meeting will be in Montreal, Canada, April 28 - May 2, 2026, and is a joint meeting with the Canadian Association for Conservation of Cultural Property (CAC-ACCR). See you in 2026!

www.culturalheritage.org/meetings



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Opening General Sessions

In Commitment to Community: BACC's Journey into Radical Inclusion

Speakers: Leticia Gomez Franco, Bianca Garcia, Authors: Leticia Gomez Franco, Bianca Garcia, Morgan Wylder

What is a nonprofit regional center? This question often arises among conservation and preservation professionals. The staff at the Balboa Art Conservation Center (BACC) have spent the past four years answering it for themselves. Founded in 1975 by George Stout and Richard Buck, BACC was established to serve the collections and conservation needs of a select group of San Diego institutions. Over the decades, BACC adapted its identity and role in response to economic shifts, technological advances, fluctuating preservation interest, and social changes. Historically, BACC met its nonprofit duty by offering training fellowships and operating on a fee-for-service basis, which limited access to those who could afford it. This business model was over-reliant on earned revenue, and rendered the organization incapable of serving anyone who was unable to pay. BACC struggled to exist as a high capacity but exclusive and inaccessible organization for decades.

The retirement of a long-standing executive director at the end of 2019, along with the search for a new one in early 2020, combined with the COVID-19 pandemic and national protests following George Floyd's murder, sparked significant institutional changes. Without an executive director, BACC staff stepped up into leadership roles. Staff envisioned a transformative era for BACC, aiming to make it relevant and responsive to the local community. They launched programs like Preserve Community Art, which focused on preserving protest art and its stories. The success of these programs confirmed the new direction for BACC. Collaborating with the board, they sought a new director who understood nonprofit work and could build community connections. They found the right person. BACC has spent the last four years making up for 46 years of exclusivity, opening its doors to all and inviting in those who were intentionally left out. Being in conversation with community partners has reshaped BACC's mission, work, and the way the organization operates

BACC understands and acknowledges its historical role in perpetuating structural inequities and prioritizes access and equity to foster diversity and inclusion within the conservation field and broader arts community. The Center continues to provide conservation treatments while rethinking how regional conservation centers interact with collections and communities. The new vision includes inclusive conservation programs that extend access to underserved communities, support education and training, and partner with caretakers of community-based cultural collections. Additionally, BACC aims to expand knowledge in culturally conscious conservation methods by collaborating with creators and custodians of diverse cultural and ancestral collections.

This radical shift repositions BACC's relationship with collections and communities, moving away from saviorism and charity-based service towards collective responsibility for the preservation of cultural heritage. This transformation has brought up questions about the role of regional centers and provoked varied responses from the field and funders. Some offer enthusiastic support, while others defend traditional approaches. Despite these reactions, BACC remains committed to its mission, adapting to the evolving needs of the cultural ecosystem. The Center's renewed mission is clear: The Balboa Art Conservation Center advances the study and preservation of cultural heritage for all communities.

Considering Elements of Effective Collaboration at the National Museum of the American Indian

Kelly McHugh

The vision and mission of the National Museum of the American Indian (NMAI) includes collaboration and partnership to realize equity, empowerment and social justice for Native peoples across the Western Hemisphere. Since the founding of the NMAI, the conservation team has worked with artists and communities to care for cultural heritage. Through decades of building and maintaining these relationships, we have witnessed the benefits to our constituency, the collection items, and our staff. Our ability to be effective collaborators is ever evolving. We've learned how collaboration is a relational practice encompassing critical elements, such as building trust, recognizing truth, providing access, acknowledging power dynamics, following through, and ultimately preserving what is valued. These elements of effective collaboration are even more important today considering the Smithsonian Institution's recently adopted Shared Stewardship and Ethical Returns Policy. The policy formalizes relationships between institutions and their constituencies; therefore, the success of its implementation hinges on the strength of these partnerships.

In order to achieve partnership equity, it is vital to operate in service to the collective goal, prioritizing the group's objectives over individual agendas. Trust serves as the foundation for any collaborative endeavor and is built on consistent and transparent communication, reliability, and mutual respect. Humility, equitable power dynamic among all stakeholders, as well as truth recognition and an understanding of historical facts and present realities are essential. Power dynamics play a significant role in collaboration; balancing power among stakeholders ensures equitable participation. Access to relevant resources and open information sharing ensures well-informed decision making. Commitment follow-through and continuity are critical to maintaining trust, demonstrating reliability and sustainably supporting long-term impact. Preserving what is valued identifies and safeguards core principles, traditions, and goals essential to the collective identity and purpose of the collaboration.

This presentation will include an overview of the elements of collaboration as they have developed through decades of long-term partnerships between the NMAI and indigenous partners and colleagues, building relationship along the way. This presentation will also discuss how effective collaboration continues to be shaped by the Shared Stewardship and Ethical Return policy as implemented by the NMAI and sister museums in the Smithsonian family. This presentation establishes a base for the concurrent general session submission: "NMAI Collaborative Relationships: A Focused and Critical Look" which evaluates specific examples of collaborative partnerships with various communities and colleagues across the Western hemisphere.

Powerful Places: Cultivating cultural resilience in Minnesota's sacred ecological sites

Justine Wuebold

Note: This abstract is prepared on behalf of the AIC Sustainability Committee in partnership with local non-profit organizations listed in the abstract.

Natural landscapes and their non-human components are as much a part of cultural heritage as man-made materials and their intangible elements. By acknowledging the fragility of these environments, cultural heritage conservators can better engage with the natural ecological connections that are intertwined with the source of heritage and belongings made by communities local to these cultural landscapes. The concept of our project is part of a larger initiative to highlight local and significant ecological resilience concerns, and discuss their relation to cultural heritage and broader regional adaptation strategies.

For this annual meeting, we propose a talk on environmental stewardship of regional sites that are sacred to the Dakota People and other local communities, and are at-risk to climate change. Ȟaȟa Wakpá (the Mississippi River) is the second longest river in North America and represents cultural significance as a vital waterway for sustenance and transportation. The river is considered a sacred and powerful entity to many Indigenous peoples living along the Mississippi and its tributaries. For the third year in a row, extreme drought conditions in the Midwest are drawing down the river's water levels, with widely varying precipitation patterns and flooding throughout the year attributed to impacts of climate change. Two non-profits local to the Twin Cities are addressing the environmental and cultural needs for sacred sites connected to the river. Wakan Tipi Awanyankapi, a Native-Led, East Side environmental stewardship nonprofit located in St. Paul, MN, focuses on the Lower Phelan Creek, its caves and burial sites. Based in downtown Minneapolis, Owámniyomni Okhódayapi advocates for the transformation of Owámniyomni (St. Anthony Falls), where Dakota peoples traditionally gathered for ceremonies, trade, and offerings, into a place of community healing "where Dakota history, language, and culture are visible and celebrated". As Owámniyomni is in close proximity to the conference

venue, a pre-conference tour with the non-profit is under consideration by AIC leadership.

These two organizations, both centered in Dakota values, strive to preserve their sacred connections with the land and form bonds of kinship for healing within their communities. The AIC Sustainability Committee proposes to collaborate on a talk with a representative from one or both of these organizations to promote the cultural heritage significance these sites have for Mní Sóta (Minnesota) communities and collaborative efforts to restore them. We will highlight regional perspectives and draw connections with ecological and cultural conservation communities, which have critical overlaps.

Curiosa Naturalia: Bringing a natural history collection back to life

Speakers: Mariana Di Giacomo, Authors: Martín Batallés, Mariana Di Giacomo, Erika Del Pino, Paula Sánchez

In 2019, curiosity, exploration, and a love for collections drove Martín Batallés and Erika del Pino to collaborate with the Dr. Carlos Torres de la Llosa Natural History Museum and the Secondary Education Central Library in Montevideo, Uruguay. This collaboration began as a way to imagine bridges between conservation, art, and biology, to reflect on the role of fiction in natural science exhibits, and to start asking questions about what are considered materials worth discarding in natural history collections.

Curiosa Naturalia is a visual arts and museological project that involves research, salvage, and conservation of specimens and objects that had been unmanaged in storage spaces. Taxidermy mounts, posters with illustrations, books, fossils, bones, and didactic models of animals and plants were reconditioned to create a series of small installations inside the museum galleries, in an "exhibit within the exhibit" fashion.

The beginning stages of the project were focused on building relationships with museum and library staff to generate trust and excitement about bringing collections back to life after years of neglect. An important aspect of this stage was the learning from those who had worked at the museum for years, who had institutional memory and understanding of the history of decision making and prioritization in the collection. Following that, consultations with experts in topics such as conservation, history of science, and history of natural science exhibits in Montevideo made it possible to begin to properly care for these objects and to give them a new life in a different context.

Conservation work consisted mainly in cleaning the objects and specimens. Some specimens had been so seriously neglected that they could not be recovered. These became ideal specimens to be intervened more invasively, allowing them to continue to serve their exhibit purpose but with a new identity. Conversations with museum authorities allowed for the modification of the intent of the specimens from scientific display to an artistic and evocative one.

The last stage of the project involved mounting several small exhibitions, one within each gallery of the museum and in one room of the adjoining library. On opening day, there was a tour of the space done by an actress that brought the audience into the world of curiosity and nature. After that, the installations were on display for two months, during which we continued to work with museum staff, who by then had become highly engaged with our work and whose enthusiasm for the care of the collections continued to grow.

Curiosa Naturalia began as a project to recontextualize natural history specimens within the realm of art. Nowadays it has morphed into a collaboration with museum staff to care for collections and to tell the story of their own museum. Since then, other instances of exhibition, talks, and collaboration have stemmed from this initial phase. We like to think this project is far from finished and that the collaborations and relationships we fostered will continue to reshape Curiosa Naturalia through years to come.

Threads of Time: Discovering a 19th-Century Faroese Knitted Sweater

Speakers: Marina Casagrande, Sarah Noble

Authors: Marina Casagrande, Sarah Noble, Marc Vermeulen

The Prize Papers Project focuses on studying and digitizing the Prize Papers, a unique archive documenting global daily life during European colonial expansion. The project is a collaboration between The National Archives, UK (TNA) and the University of Oldenburg, Germany. Among these documents was found a collection of unopened packages from the Faroe Islands dating from 1807. A major scheme was developed uniting researchers, conservators, scientists, and professionals from around the globe to safely assess, record, image, open, and analyse this collection. The project was led by TNA's conservation and research teams in close partnership with The Faroe Islands National Museum and University of Oldenburg.

Prize-taking resulted in an extensive archive, including documents from over 35,000 captured ships. Among these ships was the Anna Marie, a Danish merchant vessel from Tórshavn to Copenhagen, seized on September 1807. The Anna Marie, one of two ships owned by the Danish king, carried mail representing about a quarter of the communication between the Faroes and Denmark that year. Among the various letters, five unopened parcels containing knitted goods and grains were found. The most remarkable was a hand-knitted red woollen sweater with a navy and white pattern, the only known example and precisely dated knitted sweater from the Faroe Islands for this period. This discovery is of major significance for Faroese society as the sweater was accompanied by a letter detailing its origin, sender, recipient, and context. Few collections offer such rich insights into early 19th-century Faroese everyday life.

Opening these culturally significant items involved many people and irreversible decisions. Lead by the conservation team, there was a consensus to open the parcels due to their potential significance, whilst leaving one package sealed for future reference and analysis. The parcels were photographed, filmed, and photogrammetry images were taken aiming to capture every detail that would be lost once opened. The unwrapping and content reveal were then conducted in the presence of the Faroese and Oldenburg teams, researchers, and media, marking a historic moment, and providing the Faroese with the unique opportunity to uncover this new sweater design.

The significance of this discovery was greatly enhanced by the collaboration with the Faroe Islands team. Their immediate recognition of the unique pattern and expertise in reading the letters underscored the importance of this partnership.

The items were rehoused with each object, wrapper, cord, and letter grouped to maintain their materiality. The wool and grains are undergoing extensive analyses. Colourants have been identified, and DNA profiling, using reference materials from colleagues around the world, is being performed to determine the origin of wool. The results, expected by May 2025, will provide insights into wool trade and resources in 19th-century Faroese society.

The value of this collection lies in its completeness, never has a knitted pattern from the Faroe Islands been dated so precisely and found in such pristine condition. The rarity of these objects and the opportunity to collaborate with a diverse spectrum of partners is what makes this project so unique in its perspective.

Concurrent Sessions

We're All in This Together: Conservation Outreach and Community Engagement

Teacher/Conservator Co-Creation: Lessons in K-12 Outreach at the Conservation Center for Art and Historic Artifacts

Greg Stuart

This year, the Conservation Center for Art & Historic Artifacts (CCAHA) developed and piloted an in-school educational program for students in grades 6-12 in the Philadelphia school district titled "Art Conservation in the Classroom: Science, History, and Creativity". Through outreach visits to classrooms, and pre- and post-visit lesson plans that teachers can adapt to their curricula, this program introduces students to the fields of cultural heritage conservation and preservation, applies transferrable skills from these fields to other areas in their lives, and empowers them to care for the meaningful heirlooms in their families and communities.

This program has arisen from the regular meeting of a CCAHA staff committee devoted to the development of K-12 educational programming. This committee was formed in response to the goals of FAIC's Held in Trust report about the need to build awareness among young people, particularly from BIPOC, LGBTQIA+, lower income, and disabled communities about the conservation field and the careers within it. In addition to making students aware of conservation as a possible career path, Art Conservation in the Classroom also aims to demonstrate how conservation links to other subjects such as chemistry, biology, art, and history. By utilizing original artworks and historical documents from CCAHA's study collection, the program also reinforces the importance of primary sources, what can be learned from physical examination of them, and the need to care for them for future generations.

Recognizing the importance of co-creating these lessons with teachers who hold the expertise in their student's needs, we kicked off the program with an Educator Open House designed to introduce educators to the kinds of things that we could do in their classrooms with the idea of sparking a conversation about how to adapt these ideas to their curricula. Following this, lesson plans will be developed in conjunction with a paid advisory committee composed of local teachers as well as education/writing consultant Lori Litchman, who is herself a former high school teacher.

In this presentation, CCAHA Education Program Manager, Greg Stuart, will share lessons learned from this program in the midst of its first year with an eye towards how you can implement K-12 programming at your own institution.

"Art Conservation in the Classroom: Science, History, and Creativity" is generously supported by the FAIC's Holly Maxson Conservation Grant.

Letters to a Pre-Scientist: Accessible and Inclusive K-12 Outreach for Every Conservator

Ella Andrews

Letters to a Pre-Scientist is a free, accessible, and easy avenue for conservation outreach. Letters to a Pre-Scientist is a program that connects 5th-10th grade science students in low-income communities across the US to an international network of STEM professionals. Each student, or "pre-scientist", is paired with a STEM professional and over the course of a school year, they correspond through eight letters. The letters discuss higher education pathways, career journeys, and overcoming obstacles. After you're accepted to be a pen pal, you complete a training module to prepare you for writing to an audience you might not generally interact with. The training modules teach you how to tell compelling stories in STEM and adapt complex or abstract ideas to middle school reading levels. The resources available through the training portal dive into the systematic challenges around inequitable STEM education in the US and how to close the gap in communities. The goal of LPS is to broaden students' awareness of what STEM professionals look like, demystify STEM career pathways, and inspire their curiosity about a future in STEM.

Students are matched with scientists based on their interests, allowing students who are interested in art to be paired with a conservator. In my first year as a pen pal, I was assigned to a 12-year-old girl who was interested in art but was not excited about STEM. Through images, diagrams, and compelling storytelling, I was able to discuss current work I was doing and how it combined art with science. I related aspects of my work, such as corrosion on metal objects, to what the student was learning in her science class. The Letters to a Pre-Scientist program also allows you to send class activities to the science teacher, enabling conservators to pass along hands-on conservation workshops such as testing pH on old paper. I was able to talk to my pen pal about my own academic struggles in chemistry and how I overcame them. We were able to form a relationship on a personal level by discussing her friends, music interests, and our pets. Doing so humanized me as a STEM professional. Not only was the program fulfilling on a personal level, but the training also empowered me to learn more about systematic barriers within the cultural heritage field. The program has also challenged me to explain my work in a new way and has made me more confident speaking to intergenerational audiences. Letters to a Pre-Scientist is ideal for all conservators looking to make a difference, including emerging professionals who want to become more involved in outreach or private practice conservators who don't have access to institutional outreach programs.

Community-Led Preservation: Our Stuff, Our Stories at the Conservation Center for Art & Historic Artifacts

Katie Lowe, Greg Stuart

This year, we piloted a new program at the Conservation Center for Art & Historic Artifacts, titled Our Stuff, Our Stories, which functions as a community-driven preservation pop-up. Designed to launch in full as part of the Philadelphia 250th commemoration of the Declaration of Independence in 2026, we seek to reach communities who have been left out of the promises of the Declaration, and indeed, they are often the same people for whom preservation of cultural heritage can feel out of reach.

In developing this program which offers a mix of preservation services, conservation consultation, digitization, and oral storytelling, we wanted to create something flexible and adaptable to the needs of the community organizations involved. To do so, we presented this program as a menu of options of what we might do, not what we should do, thereby taking a backseat to each organization's goals and priorities to function more in a support role. While each iteration of Our Stuff, Our Stories will look unique, we will offer lessons learned so far, as well as tips on community-driven programming and how you can create something similar at your organization.

Establishing a Conservation Outreach Position at the Smithsonian National Museum of Asian Art

Sarah Rontal

In recent years, the Smithsonian's National Museum of Asian Art Department for Conservation and Scientific Research (CSR) has increased efforts to make its work known to the public. This includes the development of resources and public programs, including in-gallery cart talks and Art & Me family workshops. The success of these efforts and interest in furthering them led to the creation of the position that I now hold: an outreach specialist, with a background in education and outreach, who could develop new ways to introduce conservation to diverse audiences. This presentation will discuss the opportunities and challenges associated with establishing a conservation outreach position in our museum.

This position is unusual in several ways and required creativity in establishing standard practice. First, given the position did not require a background in conservation, initial months were focused on observation and inquiry. This period was also spent exploring existing content, which could be applied in new ways without the need to borrow excessive time from colleagues. Additionally, the whole department needed to adapt to an increase in outreach output.

Conservators and scientists learned to share their work methods and identify projects that could tell conservation stories.

The establishment of this position also redefined the CSR department's relationship with other departments, particularly Marketing and Communications (MAC) and Education. Given that CSR could begin producing programs and materials with greater independence, it was important to configure these activities into the greater fabric of the museum. Furthermore, as these departments were peers in terms of their roles in the museum, they were ideal collaborators for projects requiring more than one outreach or education staff member. Although there had been some previous collaboration with family programs, more regular channels of communication were established between CSR and other relevant departments. Through these channels, significant opportunities for collaboration took shape.

The establishment of this position has been a shared effort, making possible a number of opportunities. CSR now contributes more content to social media, resulting in regular in-depth posts about conservation. In March 2024, this led to the most popular post in museum history, with over one million views, which featured one of our paper conservators. CSR also designs and facilitates a hands-on conservation workshop for visiting students. In its first year, the program reached over one thousand sixth grade students from Fairfax County Public Schools, the ninth largest school division in the U.S. It is expected to reach a similar number of students this school year. CSR also expanded its conservation family workshops so that they now reach children ages 3-11 and occur twice as often. While the establishment of an outreach specialist position in CSR required a great deal of creativity and effort, it has not only expanded awareness of our work, but also increased our connectedness to other departments in our museum.

The Stories We Keep: Conservation as the bridge to connect visitors, staff and the Carnegie Museum of Natural History's collections

Annick Vuissoz; Authors: Gretchen Anderson, Annick Vuissoz

Objects tell stories of craft, use and care, from their creation to their preservation. Preservation is showcased in museums in various capacities but is usually not directly noticeable. At times, conservation is undertaken in the public view, whether it is on a site or as part of a visible lab. In the latter case, it might often be in a temporary or small space.

The Carnegie Museum of Natural History (CMNH) has gone further. The Stories We Keep: Conserving Objects from Ancient Egypt exhibit is directly focusing on conservation, while displaying Ancient Egyptian artefacts. Resources are dedicated to sharing behind the scenes activities with the public and putting conservation in the spotlight. It invites visitors to reflect on "things" that have value to them, then to see how the museum cares for objects through different methods and tools, that are part of a conservation approach. A third part of the exhibit is a functional large size visible conservation lab.

The development of the exhibit was possible thanks to the renovation of the Ancient Egypt exhibit, put in place in 1990. The style very much reflected on the design aesthetics and education style of the time, involving human remains on view. The advanced deterioration of a large 4,000-year-old Dahshur boat initiated a reflection on the renovation of the exhibit. It was coordinated nicely with the approval of the new CMNH'S Human Remains policy in 2023, defining how human remains in general are to be handled, displayed, and returned. The policy went into effect immediately, therefore the three mummified people on display, and the coffins and grave goods associated with them, had to be removed from public view.

To better care for the human remains and the boat, the exhibition closed in 2023, with the goal of reinterpreting the collection and the space with updated knowledge on the Ancient Egyptian artefacts and new policies on human remains. Knowing that the public was very attached to the Ancient Egyptian exhibit and collection, CMNH decided to create this temporary and transitional exhibit, focusing on the way collections are cared for and on conservation in general, and allowing the public to witness the preservation of artefacts in progress. The public also has the opportunity to speak with the conservation team through an open window on a regular basis to learn about conservation work, how an institution works, and discuss various museum related topics. Besides, this has allowed to expose/inspire a career to the general public and students at the nearby colleges and high schools, as well as to recruit interns and volunteers. Educational outreach is central to the project.

The exhibition is a great example of a collaboration between the departments of Conservation, Anthropology, Exhibits and Education, with full support of the museum's director. They were involved in the development of the idea, the building of the space and the lab, as well as the efficient running of the exhibition and associated educational programs. Aspects of collection care, safe storage, mounting, and integrated pest management, among others, are additionally presented and addressed in this space. General collection care is a central theme of the exhibition and of the work in the conservation lab.

The visible lab was a long-term dream of Gretchen Anderson, the Head of Conservation at CMNH, after working in a similar lab at the Science Museum in Minneapolis. Conservators and conservation technician, interns and volunteers are currently working on the preparation of Ancient Egyptian artefacts for the new exhibit called Egypt on the Nile, planned to open in the fall 2026. Aside from this focus project, the team supports all the museum's departments with their specific conservation needs.

The Stories We Keep visible conservation lab in the middle of an exhibit is a hub, a place of collaboration with other departments, such as Ornithology, Herpetology and Paleontology, and has been a great educational tool to share with the public and build communities, and a connector between the public and the museum professionals.

This paper will present the genesis of the project and the evolution into a spotlight on conservation. It will describe the conservation lab, the collaborations across the museum, and all the exchanges that the project has fostered. The paper will express successes and challenges of such a space, and future evolutions of the exhibition.

(Un)Concealed Layers: design + public reception of a technical analysis exhibition

Courtney Books

People of all ages dream of superpowers that allow them to play doctor with X-ray vision, detective with ultraviolet lights, or artist with powdered pigments. The exhibition Concealed Layers: Uncovering Expressionist Paintings invited audiences to share in these roles through the process of technical imaging and analysis. This project highlighted new discoveries made during a three-year study of the Saint Louis Art Museum's world-class collection of German Expressionist paintings. The two-gallery show explored eleven paintings through methods ranging from physical examination to diagnostic imaging with radiography, infrared, and ultraviolet light–all designed to help identify the artist's materials and techniques. Developed by a conservation-curatorial team, this research was then embraced by departments across the museum (e.g. learning and engagement, design, digital interpretation, marketing, development, and information technology) to create an experimental, education-focused exhibition with "behind-the-scenes" sneak peeks. Originally set to run from March until August 2024, the exhibition dates were extended through that October to capitalize on the fruitful STEAM opportunities.

This presentation will take a candid approach to sharing how Concealed Layers matured from concept to installation–challenges, triumphs, and missteps included. Full immersion into the science-laden world of technical analysis, a new venture for the museum, demanded expansion of its interpretative strategies. What are the most effective ways to display an internal layer of a painting, hidden to the naked eye? Internal debates tackled everything from cost efficiency to display safety (e.g. is an X-ray emitting device perceived as safe?). Shared goals danced between engaging multigenerational visitors with artists' techniques and materials without overwhelming them with dense science lessons. Colleagues in digital assets developed interactive content for media consoles plus evergreen web content, and educators flexed STEAM outreach programming (K-12 plus universities). The exhibition occupied two galleries that are typically installed with the permanent, non-rotating collection and intersected with multiple doorways. Therefore, the museum used trackers to measure "hot zones" to map preferred pathways as visitors navigated the space. Additionally,

summer interns in education conducted comprehensive visitor interaction surveys of the exhibition. Their collective data on visitor engagement has offered invaluable encouragement of successes and, critically, areas for improvement.

Conservation-based content is not always easy for museum professionals to display. Concerns surrounding appropriate content (i.e. image rights, oversharing of condition concerns, etcetera) is often uncomfortable for stakeholders, and museum educators still face apprehension of didactic interpretation that is, by nature, science dense. Sharing a transparent view of an exhibition's variable triumphs and challenges in educational programming and public reception may promote traction for similar projects.

Leading the Way: Conservation Strategies in Museum Redevelopment

Let there be light: reintroducing natural light with mixed displays at the National Portrait Gallery London Regency Room

Alexandra Gent, Emmanuelle Largeteau; Authors: Alexandra Gent, Emmanuelle Largeteau, India Picton

In 2023 the National Portrait Gallery in London (NPG) reopened to the public after undergoing the most extensive transformation of the building since the Gallery first opened its doors in 1896. The project, known as Inspiring People (IP), comprised a complete redisplay of the Collection, significant refurbishment of the building, the creation of new public spaces, a more welcoming visitor entrance and public forecourt, and a new learning centre.

One of the key aims of the building project was to enhance the visitor experience by the controlled re-introduction of daylight into spaces where windows had previously been blocked. At the same time, the new displays diversified the type of artworks on display, incorporating significant numbers works on paper and photography in the permanent galleries alongside paintings and sculpture.

The engineering and design consultants Max Fordham were engaged to support the new vision for the Gallery. They created solar maps or 'digital twins' of the galleries simulating the natural light over a year using existing measured data as well as predicted future climate data.

The modelling used a limiting illuminance (lux) and an annual exposure limit for artworks (klux.h per year) related to the light sensitivity of objects categorised as:

2- Low responsivity (e.g. oil and tempera painting, wood, ivory) with a 200 lux limiting illuminance and 600 klux.h per year exposure limit, and

3- Medium responsivity (e.g. prints and drawings, manuscripts, miniatures with a 50 lux limiting illuminance and 150 klux.h per year exposure limit).

The use of annual exposure limits was new to the conservation team and required a shift in thinking as it did not align with the existing light sensitivity categories and exposure limits for objects at the NPG.

The digital twins allowed different methods of daylight control to be tested, including UV film, blinds, scrim and alternative settings for existing louvres. A range of different solutions were designed for different galleries, allowing curators to position category 2 light sensitive objects within the general gallery spaces.

While modelling and planning was extensive, re-introducing and managing increased daylight across a range of differing display spaces is a complex undertaking requiring ongoing re-evaluation and adjustment. After opening, light monitors were placed into the galleries where category 2 objects were on display in spaces with natural light. Positioning of the sensors was a balancing act between aesthetic considerations for the re-displayed collection, and effective data gathering. With a year's worth of data gathered since re-opening, these measurements can now be compared to the modelling by Max Fordham to assess the accuracy and review the parameters if necessary.

This paper will discuss the challenges posed by the new approach to light management at the NPG and also the role of cross-team collaboration in the management and delivery of lighting projects.

"If you build it, they will come": Building a Climate-Controlled Storage Unite Inside a 1940s Warehouse on a Navy Base

Meghan Rathbun, Maria Vazquez

Artifacts need to be stored somewhere, but there's always a range of options from dirty basements to scorching attics with pests, mold, lead, and all sorts of other hazards and issues. It doesn't happen in everyone's career that they have to move an entire artifact collection, but usually when it does, they don't get a choice on where the artifacts will be stored. Once in a great while, you get the opportunity to have a brand new custom storage facility, and if you're REALLY lucky, then you're included in the project to be able to advocate for the collection and how it will be stored. This was one of those times.

This was a construction project for a fully-roofed and insulated, three-hour fire-rated climate-controlled collection storage building inside of a "temporary" warehouse built in 1941. (We can see how well that temporary thing went.) To complicate this build further, this was to be done on a highly secure Naval base in Newport, RI. This complicates the process of finding contractors, getting people on base to do the work, getting construction equipment on the base, and what can even be ordered to be used for the project.

Thankfully, a trained conservator was brought into the project at the very beginning stages of it, making sure that every need was considered for the space to function best for the artifacts. Temperature, humidity, lighting, conservation equipment, sinks, door heights, exact high-density storage needs, fire suppression systems, office areas, etc. were all able to be considered in the beginning, instead of at the end, or not at all.

This talk will cover the struggles and triumphs from the very beginning of the project, through its completion. Unforeseen problems along the way will be discussed to help others in the future for their own considerations when completing a similar project. Conservators aren't, generally speaking, also construction specialists, so hopefully, this talk will give some helpful tips to be considered in other collections' construction projects.

Hundreds of objects, very few of us: treatment, prioritization, and teamwork during the Yale Peabody Museum renovation

Mariana Di Giacomo

On October 10th, 2019, at 8:30am, I started my job as Natural History Conservator at the Yale Peabody Museum. That same day at 11 o'clock, I had a meeting on how to protect the Age of Reptiles and Age of Mammals murals by Rudolph Zallinger during construction. This need for conservation knowledge and expertise continued for the remainder of the project, which ended in the spring of 2024 with the reopening of the entire museum after four years of closure.

Work during construction involved liaising with construction workers, architects, and engineers, as well as with museum leadership and colleagues. The conservation staff consisted of only me and one fellow initially focused on moving collections (and later on, on treatment of Anthropology objects). Partnerships with other departments that were not able to carry out their normal duties due to the pandemic, as well as with museum assistants made the work manageable and delegation of tasks possible. During this time, my lab at the museum was demolished and I had to move all my operations to the Shared Conservation Lab at Yale's West Campus, as well as to a small museum classroom that was not to be renovated until the new Conservation triage space was to be built. In addition, object lists were being completed and exhibit layouts were being held by Exhibits with curators and collection managers, and me.

In 2022, I was asked a crucial question: what do you need? Being alone at the time, I answered: interns. In November of that year, the museum hired for the first time two pre-program interns for one year (positions that were later on extended). Their job was to be trained in the treatment of objects and specimens, to work on their portfolios, to have the experience of being in a renovation, and to learn what it is like to work in a museum. With my team in place, we started the impossible task of condition reporting and treating hundreds to thousands of objects and specimens with ever-changing object lists and gallery priorities.

This renovation taught me many things. As a colleague, it taught me to anticipate the needs of others. As a liaison, it taught me to speak in many other languages to get points across and to make those working with me get a sense of belonging. As a manager, it taught me that the more involved my team is in every aspect of the project, the more they will understand the bigger picture. As a mentor, it taught me to prioritize the education of the interns over the goals of the project. As a conservator, it taught me that you can always do more, but you have to learn to stop.

The Yale Peabody Museum reopened its doors in the spring of 2024 with a newly renovated museum. Conservation was involved early enough in planning but being new, I had to build trust with every person at the museum. To this day, I continue to work on this.

Lighting the Way: Museum Illumination Policies and MicroFade Testing

Sustainability-based decision making for museum lighting

David Saunders

Sustainability is proving to be a strong driver of new technologies, solutions and practices in museums. In this context sustainability is usually characterised as the saving of energy and consequent reduction in greenhouse emissions environmental sustainability. Some consideration is often given to resource use and reuse and to the financial consequences of changes made to improve sustainability.As conservators we are interested in the effect that such changes in technology or practice might have on the short- or long-term preservation of objects and on the balance between preservation of collections and their availability to visitors and researchers.In this presentation I will look at two ways in which museums have responded for the drive for greater environmental sustainability in the field of museum lighting.First, the exponential growth of lighting technologies that reduce energy consumption, principal among these being the massively increased use of LED lighting. What is the current state of LED technology, where might advances lead in the future and what alternatives are likely?Second, the greater use of daylight, which as a carbon-neutral source has been seen as another potential answer to the question of environmental sustainability in lighting. What are its advantages and drawbacks, does the implementation of daylighting save energy, and what new technologies might change the situation?In both the above cases, I will look at how a push towards greater sustainability might affect the preservation of objects and accessibility of collections, factors that have sometimes been termed people-centred measures of sustainability. In other words, to what extent do we upset the hard-won balance between preservation and access in the name of environmental sustainability?The solution, I will argue, is that our policies need to be driven by sustainability-based decision making, but that in so doing our definition of sustainability must go beyond that traditionally associated with environmental concerns to include considerations of people-centred sustainability that address the current and future perspectives of individuals, groups and societies.

Illumination and Remembrance: Lighting Practices at the National September 11 Memorial & Museum

Kate Fugett, Kerith Koss Schrager, Andy Wolf

The 9/11 Memorial Museum in New York, NY houses a collection honoring and commemorating the victims, survivors, first responders, and recovery workers of both the catastrophic 2001 attacks and the 1993 World Trade Center bombings. In addition to oral histories, digital images, audio, and video, the collection comprises approximately 30,000 physical objects, including damaged and recovered artifacts, items donated in memory of victims, and tribute art. Many of these items are composed of ephemeral, light-sensitive materials which were never intended to be preserved. However, their personal significance, and the resulting need for accessibility to the local, national, and global 9/11-affected communities cannot be overstated. In addition to a conservation approach that emphasizes the person connected with the object, other factors associated with a memorial museum context complicate the decision-making process for artifact lighting and display.

Storytelling personal narratives is a primary consideration from the acquisition phase through installation, exhibition, and storage, particularly because stakeholders are also predominantly the collection's donors. Decision-making for exhibition duration and light levels becomes a collaborative but sometimes fraught process between the conservation, curatorial, and exhibition teams. For every object slated for display, 9/11 Memorial Museum staff must consider its myriad values which may include its historical value, its associated individual victims or stories, its significance as evidence of the attacks, and the existence of identical objects or similar examples. We must also weigh its social value, i.e., the perceived needs of both present-day community members and future generations with no living memory of the day. These values factor in addition to material concerns. The inevitable result of achieving this balance is longer display periods and the reluctant acceptance of potential fading.

We propose that "lifetime fading allowances" be flexible to acknowledge that a particular object may have greater impact to the current generation than to a nebulous "posterity." When "light" and "dissociation from social/trauma context" are given equal weight as agents of deterioration, the decision to keep light-sensitive objects off view resting in storage is not so straightforward. This is especially true if an object contains a fugitive material that will degrade in storage regardless.

Conservators at the 9/11 Memorial Museum are working across departments to collaborate on a lighting policy unique to the needs our institution. These include staff resources; bespoke and inaccessible exhibition fixtures; and a lack of light-induced fading data for many of the unique and under-studied materials on display. As the factors weighing lighting decisions in traumatic contexts are not always straightforward, we are developing a decision tree to help parse out the questions bearing significance providing clarity to an otherwise daunting and subjective process. This talk will provide examples that highlight the nuances of this approach, including the identification of duplicate or similar objects as substitutions, or the creation of facsimiles, where physically and ethically feasible. As current caretakers, we acknowledge the privilege to make these subjective decisions that affect future generations' ability to understand, display, and view these artifacts and the gravity and accuracy of their stories.

Illuminating Acceptable Change: Collaborative, Data-Driven Lighting Guidelines

Speakers: Patricia Silence; Authors: Jan Gilliam, Gretchen Guidess, Neal Hurst, Perrine LeSaux, Michelle Leung, Kelly McCauley, Jacquelyn Peterson-Grace, Patricia Silence

The stewardship and exhibition of cultural heritage collections demands careful balance between preservation, institutional mandates, and visitor experience. Conservators and curators at the Colonial Williamsburg Foundation (CWF) have been refining tools and techniques for managing light exposure while navigating a range of factors that have impacted methods of implementation – creating challenges and providing new avenues for thinking about how our actions impact the collections in our care. Four of these factors will be discussed – institutional priorities, improvements to data collection and interpretation, impact on staff, and the role of visitors – with a brief discussion of future plans.

With 35 galleries across two museums and limited staff, curators and conservators are regularly asked to extend exhibition periods beyond originally scheduled end dates. Institutional habits and staff resource availability have been the driving factor for exhibition decision making. The conservation team has increased efforts to incorporate data into exhibition planning conversations by tracking light exposure levels and durations for motion-activated lighting and measuring light-induced change through spectrophotometry. These documentation activities are incorporated into long-standing exhibition practices. We are now able to introduce exhibit light budgets, based on this data, with a corresponding review triggered when the budget is near exhaustion. The predictive data from microfade testing is expected to further inform light budgets.

Pressures to extend exhibition durations of sensitive media have a direct impact on staff. They express concerns about knowingly inducing significant change in collections. This has required a reframing of the language used to describe the impact of our exhibition policies, shifting from "damage" to "change".

Longer exhibition durations yield reduced opportunities for curatorial research and writing exhibitions. Collaborative conversations about exhibition lengths, initially framed around light levels and sensitivity of artifacts, have become a platform to advocate for limiting exhibition durations based on CWF's mission as an educational institution and our preference to rotate objects or curate new exhibitions regardless of sensitivity of the media. Lack of long-term planning impacts how collections are treated. The perception of staff time being inordinately usurped by maintenance of light-sensitive media overrides consideration for the sensitivities of other object types like paintings and furniture on display in exhibitions not officially described as permanent.

Historically, the visitor's role in exhibition decisions has been based on assumptions. Staff now collect data on the use of light dosage limiting efforts, like motion activated or push button lighting, to better understand how visitors interact with exhibition spaces with low light levels. A new emphasis on visitor surveys provides valuable information to help us understand our visitors and their perceptions and preferences.

The development of these policies is ongoing, with an eye toward addressing objects that have been on display for long periods of time. Bringing these discussions to the forefront makes us more collaborative in implementing decisions that balance preservation and access.

Capturing Complexity: Addressing Imaging Challenges through Collaboration

A Partnership Between The City Palace Museum in Udaipur and The Metropolitan Museum of Art in New York: The Joint Study of Mewar Paintings Through Multiband Imaging

Marina Ruiz Molina, Bhasha Shah; Authors: Marina Ruiz Molina, Anuja Mukherjee, Girikumar Sekharakurup, Bhasha Shah

Some of the most admired Indian court painters of all times worked for the Maharanas who ruled the princely state of Mewar from the majestic palaces of the city of Udaipur in Rajasthan between the 16th and the mid-20th centuries. The City Palace Museum in Udaipur (CPM) holds a rich collection of paintings on paper described as miniature in style but not in size, as they range from one to six feet in length. These were commissioned for the devotional practice of the elites, and also to portray the splendors of a highly cultural court life, as well as the activities that expanded beyond the walls of the palaces into the surrounding landscape, such as processions and hunting expeditions. Examples of these paintings exist also in the holdings of other museums and private collections.

Few studies have been done to characterize the colorants and techniques employed in this workshop, and The CPM collection of Mewar paintings has not been subject to technical analysis yet. A recent collaborative project between The CPM and The Metropolitan Museum of Art in New York (The Met) has brought for the first time the capability to perform Multiband Imaging (MBI) at The CPM and allowed the comparison of data among the two institutions. MBI for this project includes images obtained in the visible, infrared and ultraviolet regions of the electromagnetic spectrum with a full spectrum-modified digital camera. Information obtained with MBI was supplemented with XRF analysis. Lastly, observations made on painting practices, such as the setting of preparatory drawings or the use of admixtures of pigments to represent certain common elements, like bodies of water or vegetation, were also discussed with contemporary artists who continue to exercise miniature painting following the footsteps of their predecessors. Conservators from both museums describe together the methodology they employed to obtain images that rendered objectively comparable data and will share examples of some of the findings.

Conservation is at its core the result of multidisciplinary expertise, and this case study truly illustrates the tremendous amount of collaboration that is necessary to accomplish technical imaging at this level. Conservators, curators, and officers from The CPM have worked closely with their peers at The Met. We have also benefited from the input of scientists, photographers and digital documentation specialists within the museum community and beyond. Specific discussions among these experts included best practices for color and tone calibration, workflows, light sources, filters and targets. The CPM is an international pioneer user of Met MCLED lights, a prototype multichannel LED lighting fixture designed at The Met with the intention to improve the quality and consistency of visible, ultraviolet and infrared radiation in a portable, affordable way.

While MBI has become widespread practice in many parts of the world, it is still at an early phase of implementation among museum experts in India. This project has given colleagues in the Indian subcontinent the opportunity to reflect on the benefits and the challenges associated with this complex, ever-evolving method of looking at cultural heritage.

Photogrammetry Fast: Developing a New Automated Pipeline

Kea Johnston; Authors: JP Brown, Kea Johnston

The ability to generate 3D models of heritage objects opens up many exciting possibilities for conservation. However, the options for 3D digitizing objects are either prohibitively expensive for many cultural institutions (structured light scanning and laser scanning), or too slow and skill-dependent to be of use in scanning large collections (photogrammetry). In an effort to address the limitations of photogrammetry as a commodity 3D digitization technique, a game programmer and a conservator began collaborating to reduce the total time for producing a model to ~10 minutes.

This paper presents their interim results on doing photogrammetry quickly, accurately, and reproducibly using an automated turntable and multi-camera arm along with Agisoft Metashape Pro and a processing pipeline written in the Python programming language.

The pipeline script waits for photographs from a multi-camera, processing them and building masks while photos continue being taken. A palette of computer-readable markers placed beneath the object on the turntable allows for scaling and the orientation of the object in space such that each model is oriented and scaled consistently in relation to the others. When photography has completed, the images are automatically built into a model using Agisoft Metashape Pro. The finished model is exported, and an archival render of the 3D model is taken using Blender.

After initial setup and configuration, the pipeline requires little further user input and can build a model in as little as ten minutes and thirty seconds from starting photography to the export of the final model. The pipeline script is extensible, configurable, and is usable with or without an automated turntable. This method promises to make photogrammetry not only faster, but more efficient, consistent, and accessible to a wider number of institutions.

The Challenge of Chemical Reagents: The Verona Gaius and Vergil Palimpsests at the Confluence of Technologies

Gregory Heyworth

For the past three years, the Biblioteca Capitolare di Verona, the oldest library in the world, has been the site of a manifold collaboration among four scientific- and two scholarly teams representing eight countries to solve one of the most intractable problems in cultural heritage imaging. The Palimpsests in Danger project was convened to address the illegibility of two of the most important palimpsests in existence: the Verona Gaius, the only remaining witness to Roman law, and the Verona Vergil which, along with known undertexts containing Euclid and Livy, we revealed to contain a new Apuleius.

Over two centuries, both palimpsests had been treated with multiple layers of two different chemicals: oakgall reagent and Gioberti tincture. The manuscripts, their parchment weakened by the reagents' corrosive acids, were then disbound and set in gelatin. Creating a chemical layer that overwhelms fluorescent response from the parchment and attenuates the infrared, the chemical reagents proved to be nearly insuperable impediments to even state-of-the-art multispectral imaging.

To learn more about the precise nature of the challenge and to find effective recovery techniques, the Early Manuscript Electronic Library, supported by

the Lazarus Project, the University of Hamburg, and the University of Torun, organized a program of material analysis, new imaging modalities, and innovative image processing techniques all supported by a grant from the Arcadia Foundation. XRF, XRD, and Raman spectroscopy furnished specifics about inks and reagents, whilst scanning XRF, IR Reflectography, RTI, and the newly-developed techniques of IR Fluorescence MSI and scanning Optical Coherence Tomography (OCD) yielded new images of the undertext.

This talk will reveal our results for the first time, covering the exact chemical and imaging challenges of chemical reagent-damaged manuscripts, the advantages and drawbacks of each technology and processing technique used, show never-before-seen images of the undertexts from the Gaius and the Vergil palimpsests, and make recommendations for best practice. Above all, it will highlight the importance of cross-disciplinary collaboration among scientists and scholars from the US (EMEL, University of Rochester, Rochester Institute of Technology, UCLA) and Europe (University of Hamburg, University of Torun, the Sorbonne, Oxford University, the Biblioteca Capitolare di Verona).

Collaboration in Conservation Education

A Broad Brush Approach to Learning: Preserving Community Heritage Mirage Room

Speakers: Devon Lee, Halina Piasecki; Authors: Rachael Arenstein, Pamela Hatchfield, Anne Léculier King, Devon Lee, Yue Ma, Eugenie Milroy, Halina Piasecki

In 2023, a unique course in graduate conservation treatment was developed using an approach to the conservation of community heritage focused on meaning and collaborative work at the Conservation Center of the Institute of Fine Arts, New York University. Titled Transferable Skills in Objects Conservation, this course was designed by Pamela Hatchfield, Judith Praska Distinguished Visiting Professor of Conservation and Technical Studies, in collaboration with Yue Ma, Director of Collections at the Museum of Chinese in America (MOCA), and private conservators from A.M. Art Conservation: Rachael Perkins Arenstein, Anne Léculier King, and Eugenie Milroy. Artifacts from MOCA's collection with complicated condition issues and compelling histories were selected for treatment. Students explored a variety of skills increasingly central to current approaches to the conservation of objects, including storytelling, sustainability, and provenance research. Rather than focusing only on examination and treatment, we partnered with a local community museum, private conservators, and experts in fields including lifecycle analysis and journalism, embracing a holistic approach to the care of collections. The course also delved into treatment materials and techniques used in other specializations within conservation to highlight the composite nature of objects and the diverse range of materials and approaches that may be employed during treatment.

Established in 1980, MOCA preserves and shares the diverse cultural experiences and material heritage of people of Chinese descent in the United States. MOCA's collection was damaged by fire in 2020, an event of particular concern due to the museum's role as a repository of community heritage. MOCA's collection includes objects that are valued primarily for their significance to community members, sometimes placing less emphasis on their aesthetic and material qualities. Although intangible values are often considered during treatment, prioritizing cultural significance foregrounds the act of storytelling within the process of conserving objects. The students collaborated with MOCA staff to understand the contexts and histories of their objects, exploring archives and oral histories, developing treatments in consultation with Ma and A.M. Art Conservation, and navigating sustainability challenges. After receiving training in engaging and accessible storytelling, students shared treatment presentations geared toward different audiences: technical presentations for their conservation colleagues, general presentations for the broader community, and blog posts for MOCA's use in publicity and outreach. We also shared our work through virtual group presentations with UCLA conservation graduate students.

This holistic approach to the conservation of community heritage presents a model for the inclusion of reciprocal exchange of knowledge and resources with colleagues and those outside the field, and the importance of incorporating soft skills into our practice. This collaboration provided valuable treatment experience while presenting an opportunity to develop communication, storytelling, provenance, and sustainability skills. It enriched the learning experience for the students while making these objects accessible for the institution and the public. While students benefited throughout the consultation and treatment process, the tangible impact for MOCA will be visible when conserved objects are displayed when the renovated museum reopens in 2025.

Strategies for Accessible and Collaborative Training in Indigenous Collections Care

Ellen Pearlstein, Justine Wuebold; Authors: Nicole Passerotti, Ellen Pearlstein, Justine Wuebold

Ongoing developments have created a more enlightened understanding of the complex relationships between Indigenous communities, collections care, and museums. The inception of the Preservation of Tribal Cultural Materials in Tribal Collections program began in 2008-2009 as a pilot hybrid course offered through UCLA Extension to address the needs of full-time workers for education in the care of Indigenous heritage. The course was revitalized and offered again in 2020 in a fully virtual format, with extensive evaluation of the benefits, accessibility, and affordability of this structure. An expanded program, offered from 2022-2025 with generous support from the National Endowment for the Humanities, focuses on the unique histories, challenges, and contributions of Native peoples to their respective communities and how to honor and preserve associated heritage and belongings.

Under the leadership of Professor Ellen Pearlstein of the UCLA/Getty Conservation Program, this three-year fully supported program offered two iterations of three unique fully online courses in preservation techniques, collections management, and exhibition planning for Indigenous heritage collections. These courses were instructed by established members in the field who are already incorporating Native perspectives into course design.

In addition, UCLA/Getty partnered with two museums to offer in-person regional workshops, one in California and one in New York, for Native heritage stewards to engage with care and conservation of collections, with instruction by conservator Nicole Passerotti who directs the Mellon Opportunity for Diversity in Conservation, and Michelle Brownlee, collections manager at the Field Museum. The workshops were planned around topics suggested by participants, and aided in skill building for enclosures, introduction to risks in museum environments, and basic cleaning methods for a variety of materials, while also providing opportunities for networking and engagement with Native stewards in their region of the US.

In this presentation, we will describe the successes and challenges posed through this work and discuss how continued offering of these types of learning opportunities has been beneficial to Indigenous communities through participation and peer mentorship. We will also discuss shifts in collections care pathways that encourage students who are at different levels of their career or who come from diverse backgrounds to find suitable introductions to conservation training opportunities.

Teaching and Networking as a Strategy for the Preventive Conservation of Cultural and Scientific Heritage at the University of São Paulo and in Brazil Mirage Room

Ina Hergert, Juliana Saft

In Brazil, there are very few options for education in conservation, and none in the state of São Paulo. The University of São Paulo (USP), the largest in Brazil, does not offer any degree programs in conservation and restoration. In 2018, some USP affiliates founded the Preventive Conservation Network of USP (REDE) aiming to promote heritage preservation initiatives such as discussion groups, events, training sessions, and courses to address this gap.

Amongst courses organized by REDE, the "Preventive Conservation of Collections Course" is the most successful in terms of public interest and feedback. This course is divided into three sequential modules: 1 - The Impact of the Building and Its Surroundings; 2 - Collection Management; and 3 - Conservation

Science for Collections. Each module consists of 36 hours divided into online classes, site visits, and hands-on training. It emphasizes the practical application of the content, ideally using the institution where students work as a case study. The course is coordinated by REDE and features five to six experts teaching specific topics.

Until now, Module 1 has been offered three times (2022, 2023, 2024); Module 2 is being prepared and will be available in early 2025; and Module 3 is planned. The demand has been steadily increasing (over 70 applications for 25 places in 2024). The students are primarily from the state of São Paulo, but many come from other states as well. It has an affordable price, and its hybrid format makes it accessible to those who work and study in parallel. As teachers, we have observed that, despite being a short-term course, the engagement, quality of discussions, and results are excellent. The final project typically generates a diagnostic with proposals for the analyzed areas that are presented to colleagues and teachers, giving a unique view of the diverse realities of Brazil.

The case studies profile is very broad: from big public cultural institutions to smaller places run by volunteers. As teachers, we have the privilege to see the diversity and richness of collections, but we also feel the enormous challenge of preserving them. The exchange of experiences shows that, independently of the resources available, the presence of qualified personnel must be an essential goal.

The feedback we receive consistently highlights the quality of the course content, which addresses cutting-edge topics of preventive conservation and presents an evaluation methodology for collection storage facilities developed by the School of Architecture and Urbanism (FAU-USP). Students and teachers stay connected by WhatsApp group and, even after two years we still observe active networking.

At the AIC Annual Meeting, we would like to present the results of the REDE strategy of investing in courses and training focused on advanced knowledge in preventive conservation. This approach has been successful in the vertical dissemination of knowledge (from teachers to students) and also in the horizontal exchange of experience (among all participants). We also want to reflect on the urgent need for USP to establish formal public education programs to secure the preservation of our cultural and scientific heritage.

Enhancing Diversity in Conservation through Collaboration at the World's Largest Consortium of HBCUs

Shannon Kimbro; Authors: Shannon Kimbro, Tempe Stewart

The collaboration between the Institute of Museum and Library Services (IMLS), Spelman College Museum of Fine Art, and the Atlanta University Center (AUC) Collective represents a significant initiative to enhance diversity in the conservation field. This partnership aims to provide collections care exposure, education, and pipeline opportunities for students from the AUC, which includes Spelman College, Clark Atlanta University, and Morehouse College. As part of the world's largest consortium of historically Black institutions, this collaboration leverages the AUC Art History and Curatorial Studies Collective, an emerging leader in nurturing Black art historians, curators, and museum professionals. As an active educational partner of the AUC Collective and the only museum in the nation with a mission focused on women artists of the African diaspora, the Spelman Museum is uniquely poised to respond to calls for social and racial justice impacting the museum industry.

Through a $500,000 IMLS grant, the Spelman Museum focuses on advancing collections care, accessibility, and diversity. The project emphasizes educational programs and student participation, offering work-study and internship opportunities to foster hands-on experience in conservation while digitization and organization of the museum's collection, which comprises a nationally recognized repository of works by Black artists.

The initiative also explores integrating conservation into the AUC Collective curriculum, offering workshops and exploring various training modules. This collaboration aims to make significant strides in diversifying the field of conservation and enhancing the cultural vitality of the museum industry.

Documenting Reactivations: Between Materials & Sensory Experiences and Interactions

Jordan Wolfson's Body Sculpture: Transferring skills and documenting robots at the National Gallery of Australia

Paul Coleman; Authors: Melanie Barrett, Paul Coleman, Neve Foxcroft

In 2019-2024, The National Gallery of Australia (NGA) commissioned, exhibited and acquired the artwork Body Sculpture by provocative American artist Jordan Wolfson. Body Sculpture utilizes an industrial robot suspended from a gantry, and a metal animatronic cube form with arms and hands. Across choreographed phases, the cube performs humanistic behaviors and emotional states: drumming its surface with its hands, being swung and beaten whilst suspended by a chain from the ABB robot, simulating states of playfulness, sexuality, shame, rage and death.

The technical complexity of the artwork is unparalleled in the NGA's collecting history. The production of the artwork included Jordan Wolfson Studio collaborating with diverse specialists including choreographers, highly specialized roboticists, software engineers and structural engineers. The extended production phase of the artwork in the US, meant limited access from Australia, and ongoing technical refinements extended beyond the exhibition opening due to both the complex nature of the work and the ongoing artist investment.

Meeting Australian robotic safety standards, digital security requirements and battery safety regulations were managed in a variety of ways: including contracting a robotic safety robustness report and developing a risk management framework to distribute responsibilities between risk stewards, ensuring ongoing responsibility for public and artwork safety.

The specialized knowledge required to build the artwork means that critical knowledge of technical properties is distributed between a network of specialists, holding at times proprietary knowledge and resulting in a reliance on contractors. Acquiring Body Sculpture required transfer of a basic level of operational knowledge to the museum, and this was transferred particularly when the 4 person US led technical team moved to an entirely local team, with online support as needed.

The documentation of operational and maintenance skills was undertaken by technicians and conservators and included extensive manual review and development, the production of facsimile components for future training purposes, video documentation, maintenance logs, performance statistics and iteration specific documentation. The documentation requirements essential for transferring this operational knowledge challenged NGAs internal document management processes. This prompted development of new processes across departments to manage the scope and complexity of produced documentation, leading to the development of a centralized document management system for complex artworks.

Body Sculpture exists at the intersection of materiality and the technological cutting edge. Decisions made during commissioning and exhibition of the work resulted in the ongoing development and evolution of the performative outcome. It is inevitable as technology changes and evolves, so too will the realization of this work. Central to ensuring its continued success is a robust yet flexible documentation approach. Throughout this presentation the authors reflect on the ongoing challenge of ensuring future transfer of knowledge from disparate subject matter experts, operation technicians and internal stakeholders. The role of the conservator throughout this process is discussed, as well as reflections on the realities of relinquishing control over the direct material outcome of the work and instead locating oneself in a stepped back role of mapping and maintaining the interconnecting relationships between disparate subject experts whose experiences combined actualize the work.

A Touchy Subject: Advancing Tactile Accessibility for Everyone

Jessica Chloros

Museums and other cultural heritage sites are working hard to attract and welcome more diverse audiences. This talk will examine ways in which conservators can be a resource for finding and expanding the common ground between best visitor experiences and best practices in caring for collections. The particular research to be presented is focused on improving access for visitors with blindness and partial blindness but, as in other contexts, an improvement intended for one group often extends well beyond that.

Art conservators are often the ones who have to balance the competing priorities of visitor access and protecting collections. In museum settings this may translate to stanchions, platforms, vitrines, guards, alarms and "Please do not touch" signs. But as any museum professional knows, people love to touch and feel things. For people with visual impairments, being able to touch and feel the art is one of a limited set of options for experiencing the collection.

Like other museums, the Isabella Stewart Gardner Museum (ISGM) in Boston, offers guided touch tours for visitors with visual impairments; however, these tours are generally limited to a select group of three-dimensional objects. Unlike sighted visitors, blind visitors do not have the opportunity to engage with two-dimensional works of art that typically hang framed on gallery walls.

In response to the limitations of touch tours and a mid-career "itch," in 2024 I applied for and received a Fulbright U.S. Scholar award to the University of Dundee in Scotland. The subject of my work was to research ways of advancing the accessibility of two-dimensional works of art such as paintings, prints, drawings or photographs that have historically been excluded from museum touch tours. At the university I was situated in an interdisciplinary studio within the Duncan of Jordanstone College of Art and Design, called Studio Ordinary. Studio Ordinary is a place where design research and disability studies come together so design can be used as a tool to change the conversation around disability.

While the focus of my work was outside of the explicit confines of art conservation, I approached my research by centering on my deep experience as a practicing art conservator and the knowledge of materials that comes with that. That experience and knowledge opened many doors, making it possible to collaborate with and learn from a range of colleagues including disability scholars, designers, artists, technology experts and members of the blind community. I will show examples of prototypes we produced in Scotland, share the ways in which my project evolved to include multi-sensory experiences, and how this work is moving forward in Boston.

Future lives: Collaborative approaches to the Conservation of Choreographic Artworks

Rochelle Haley, Louise Lawson

The research project Precarious Movements: Choreography and the Museum (2021 to 2024) funded by the Australian Research Council brought together artists, researchers and museums to discuss the best ways in which to support the choreographer and the museum. Choreographic artworks within the scope of visual arts and museum contexts considers dance as a contemporary art medium, as distinct from contemporary dance presented on the stage. Collecting, and therefore conserving, choreographic artworks by museums is relatively new, with the first choreographic work collected into a museum was in 2016 with Dance Constructions by Simone Forte acquired by Museum of Modern Art, New York. Tate acquired its first choreographic artwork three years later in 2019 and now has three choreographic works in its permanent collection.

The project placed communities of artists, choreographers and performers at its centre, and engaged with artists to commission six new artworks. Two of the commissioned artists were core researchers throughout the project enabling the exploration of what is needed to conserve such artworks working in partnership with the communities that create, produce and present such artworks. The exploratory space of research facilitated a level of autonomy and agility to consider new ways of doing between disciplines, institutions and worlds of practice that might not have come together through the usual institutional pathways of acquisition or display. The presentation reflects on how moving towards a social model of conservation, that places the community centrally, is required. People have always been at the centre of choreographic artworks, and the need to work collaboratively across our practice, building trust, nurturing relationships is critical. It is these instances of social connection that have enabled choreographic works to materialise and thrive in their future lives.

A focus in this presentation, beyond the wider research project, is one the commissioned artworks, A Sun Dance by artist Rochelle Haley, also a core researcher in the project. This work was co-commissioned and presented with the National Gallery of Australia in February 2024. At the heart of the work is a relation between sunlight, dancer and architecture. A Sun Dance is a site-harmonising performance made in relation to sunlight streaming through architectural forms, providing a changing 'set' for dance over the course of a day. Documentation strategies, informed through the relational practices across the conservators, performers, archivists, artists, curators and producers formed a key part of the working process for the authors, with engagement and partnership stimulated by both the commission and associated research shifting into practice. A performance manual was developed alongside the work and tested in a subsequent presentation of A Sun Dance at Tate St Ives in September 2024, further revealing a collaborative approach to the translation and transmission of choreographic artworks in different spaces and contexts. It also revealed how A Sun Dance is materialised and mobilised through the social connections surrounding it, what holds the work together, and how to preserve what is valued across the networks and relationships of the communities that sustain such works.

Visceral Adipose Tissue: Overcoming Boundaries for the Presentation and Preservation of 2000-04-11 by Gu Dexin

Alessandra Guarascio, Sara Moy

Gu Dexin, a radical pioneer of contemporary Chinese art, retired from the art world after his last solo exhibition in 2009. He is recognized for his large-scale installations that explore decay, transformation, and impermanence. Using perishable materials such as raw animal flesh and adipose tissues, pig brains, fresh flowers, fruit, and plastics, his works evoke strong sensory experiences, characterized by intense odors and continual material degradation.

This contribution presents a two-year conservation project focused on 2000-04-11, an installation created by Gu for the controversial Fuck Off exhibition held in Shanghai in 2000, featuring works by 48 avant-garde artists. The work entered the M+ collection in 2013 without any historical documentation. It consists of a chair filled with visceral pork fat displayed on a vermillion-colored carpet runner, with a framed vermillion-colored wall section opposite the chair. Viewers are invited to sit in the chair, experiencing the decomposing fat while contemplating the framed red plane.

Ephemerality, material transition, and decomposition are central themes in Gu's practice. His works often deteriorate or transform during exhibitions, sometimes provoking reactions to the smell of rotting substances. Presenting 2000-04-11 in a museum context posed unique challenges due to the lack of artist involvement, limited information about the piece's creation, and the potential risks of infestation and unpleasant odors in gallery spaces. To address these issues, the conservation team conducted historical and material research and testing and consulted with Gu's assistant and others familiar with the work. We also monitored the microbiota changes in sealed pork fat to faithfully recreate the sensory experience of the piece while ensuring the safe display of the work.

Despite the absence of written instructions for reinstalling the piece, the team's approach honors Gu's conceptual legacy while adapting the work to its new museum setting. The lack of documentation is attributed to the commercialization and exploitation of the artist's work. This presentation explores the collaborative efforts made to exhibit 2000-04-11 in Gu's absence, the risks associated with recreating the experience, and the multiple voices that contributed to presenting and documenting this installation.

Conservation in Times of Historical Conflict

Conservation, site preservation, and civil war at the UNESCO World Heritage Site of Jebel Barkal, Sudan: lessons from work during armed conflict

Suzanne Davis; Authors: Elmontaser Dafalla, Suzanne Davis, Sami Elamin, Geoff Emberling

This paper reports on recent conservation and site preservation efforts at the UNESCO World Heritage site of Jebel Barkal, with a focus on how the catastrophic civil war in Sudan has challenged, altered, and expanded our team's mission.

Located along the Nile in northern Sudan, the archaeological site of Jebel Barkal preserves one of the most important ancient cityscapes in Africa. Its archaeological remains document two millennia of unique artistic, social, political, and religious achievements by the powerful, ancient African empire of Kush and include temples, palaces, a settlement area, and more than 20 royal pyramid burials. Prior to the recent civil war, the site was a popular attraction for both international and Sudanese tourists. At the same time, it is also an integral part of the nearby modern community of Karima.

Our team began work at Jebel Barkal in 2018, with a dual emphasis on archaeological research and site conservation and a deliberately collaborative approach that pairs Sudanese and foreign specialists as co-leads in every major project role. In the autumn of 2020, in part because of this collaborative leadership structure, we were fortunate to receive a generous award from the U.S. Department of State's Ambassador's Fund for Cultural Preservation to support conservation, site management, and community engagement efforts at the site. The COVID-19 pandemic and travel restrictions delayed our work, and our first full season of field conservation was held in 2023. One month after its conclusion, Sudan was suddenly and unexpectedly at war as two rival military generals battled for control of the country. Since that time, every aspect of our work has changed and, for Sudanese team members, our homes, jobs, financial security, family life, and daily existence have altered radically in stressful and exhausting ways.

This talk explores our pre-war plans, how the war has affected the site and our project in both predictable and surprising ways—good and bad, and the hard questions we have asked ourselves as the months of war continue. Our project's design and structure have helped us continue aspects of our work during the war, and we also reflect on why this has been successful for parts of the project but not for others.

While aspects of our project are unique and site-specific, the challenges we face are similar to and may offer valuable insights for other conflict-prone communities. Key takeaways include an intersectional understanding of how armed conflict, economic fragility, and climate change are combining to devastating effect for cultural heritage sites around the world; the need for special programming for internally displaced people during armed conflicts; and the need for significant, strategic shifts in conservation capacity-building in conflict-prone countries.

Wooden Churches in Wartime Ukraine: Conservation Challenges

Ihor Bokalo, Mariana Kaplinska

The use of wood is an integral part of Ukrainian culture, and the tradition of wooden building technology goes through the whole history of Ukraine, back to the very beginning of architecture. Its diversity and richness may impress even those who are well familiar with the best examples of the world's wooden heritage. Wooden churches are the quintessence of Ukrainian wooden building tradition. There are thousands of historic wooden churches in Ukraine. Many of them are understudied or introduced into scientific discourse in very general terms, the vast majority are completely unknown in the world, and all of them are endangered today, as the most vulnerable and fragile structures under the threat of Russian attacks.

After Russia's brutal invasion of Ukraine in 2022, we face many challenges in addition to those concerning conservation under normal circumstances. Scale of the damage, legislative issues on war damaged landmarks, conservation as a long lasting process while heritage buildings, if damaged and in use, require immediate response, cooperation with emergency services, database of damages and prioritizing sites in terms of conservation potential and even possibility - these are just a few to mention.

We do make attempts to preserve our heritage though, in particular wooden architecture. Among other initiatives, a project has been launched to digitally document endangered valuable wooden churches. We have defined the heritage value, architectural typology, the threat level and the accessibility (proximity to the frontline and to the border with the enemy, artillery strike risk, liberation of occupied territories etc) as the main criteria of choice of the sites. The first selected 11 oldest wooden churches in Central, Northern and Eastern Ukraine have been scanned with a 3D scanner and photo-documented on three expeditions in November 2023 - February 2024. These were 17th - 18tth century churches in Pechera, Puhachivka, Novomoskovsk, Novy Bilous, Sedniv, Syniavka, Stepanivka, Novhorod Siversky, Pyrohivka, Fastiv and Zhubrovychi. Six of these sites have overlived occupation and still remain under direct threat - a number of neighboring villages have been shelled just while we were scanning churches in Syniavka and Stepanivka. The project is ongoing as we are writing this abstract, and another 25 churches are waiting for their turn.

3D scanning together with photogrammetric surveying is one way to give these churches a chance. It allows us to record very accurately, get the maximum data in the shortest time, explore later and safe structures in detail with the understanding of colors and textures. This is valuable in case of damage or loss of a heritage building. This project is also the first stone laid for further thorough study of Ukrainian wooden churches. Unlike the western region of the country, most of the churches in question happened to be in use of the Russian Orthodox Church, due to the complexity of the Ukrainian situation, which made them inaccessible for Ukrainian scientists and architects. The last time these churches were explored as the phenomenon of Ukrainian wooden architecture was in the 1920s by the famous Ukrainian art historian and professor Stefan Taranushenko.

Specialty Sessions

Archaeological Heritage

From Ashes to Artifacts: the strategic recovery of collections from the Montpelier fire

Arianna Johnston; Authors: Nichole Doub, Arianna Johnston

In the spring of 2024, a fire at the Archaeology Lab at James Madison's Montpelier caused significant damage to collection materials, many of which were housed in polythene bags that melted under the intense heat. These recently recovered collections were in the initial phases of processing. Much of the contextual information and inventory that archaeological research depends on was recorded solely on artifact labels and paper lists that were also affected by fire. This paper outlines the development of a preservation strategy to address the state of the collection. The conservation methods tested include a combination of mechanical, thermal, and chemical techniques.The focus of the tests is twofold: first, to develop an effective approach for removing the melted polythene from the archaeological materials without causing additional damage; and second, to recover as much of the original inventory and contextual information as possible from the charred and melted labels. In collaboration with local public safety offices and archaeological repositories, further research is taking place to assess how the choice of storage materials may impact artifact preservation and recovery in fire events.

Heritage West | Archaeology, Conservation, and Community in West Philadelphia

Michaela Paulson; Authors: Megan Kassabaum, Sarah Linn, Qi Liu, Michaela Paulson

Penn Museum archaeologists began organizing Heritage West, a community archaeology project in West Philadelphia, in 2019. The initiative doubled as an undergraduate course in 2023 involving Penn faculty, staff, and students, as well as members of the public who live and work or whose families lived and worked in the immediate vicinity. Throughout 2024, lab work and processing of the materials took place at the Penn Museum, near the excavation site. Heritage West as a whole is a significant outreach and engagement opportunity that highlights local archaeological resources, makes field and lab experience accessible, and explores research questions of interest to people in the neighborhood closest to the museum.

Archaeologists implemented extensive preparatory work to direct their focus and goals, concentrating on the Black Bottom, a once thriving Black community in the area now called University City. It was destroyed in the 1960s under the guise of urban renewal. The archaeologists believed that oral histories collected early in the project and existing archives about the area could be enhanced by archaeology. Excavation pushed the historical narrative of the neighborhood further back in time than living memory, adding material weight to stories of people who lived there, uncovering artifacts inspiring further memories and revealing aspects of daily life rarely recorded through other historical methods.

Site conservation is about balance: the excitement of discovery and slowly revealing surfaces to avoid destroying historical data; the amount of material uncovered and the need for storage; the budget and the best supplies; the desire for democratizing access to archaeological training and the fragility of the archaeological record. The team experienced tight timelines and navigated continuously changing circumstances between the short excavation season (10 days over one semester), the physical location of the site in public spaces (a community center's active gravel parking lot and yard), and the variety of excavators (from novice students and community members to practiced archaeologists). This excavation was not an example of perfect site conservation, but it exposed community members, undergraduates, graduate students, and museum staff to the effectiveness of a historical archaeological team that includes a conservator. Students in the class and community volunteers were interested in the relationship between the fields and had good instincts for asking questions most pertinent to each specialty. They quickly brought the conservator materials for possible identification, drew attention to more fragile finds for options for lifting and storing, and learned how to expose relevant maker's marks, decorative surfaces, and other important details of recovered artifacts.

The future of the collection is going to be decided in close collaboration with members of the team of volunteers who helped plan and excavate. This group of community volunteers all have current or familial relationships to the neighborhood or work in community organizations supporting current residents. It is hoped the artifacts will survive to be used in local artist efforts towards memorializing the neighborhood or on display in exhibitions, and that will be due to the efforts of the team to incorporate conservation considerations throughout the project.

Hazy and Fragmented Memories: Revitalizing Two Archaeological Glass Carboy Bottles

Yuyin (Charlotte) Li; Authors: Yuyin (Charlotte) Li, Katie Linder

In preparation for the Colonial Williamsburg Foundation's new Colin G. and Nancy N. Campbell Archaeology Center (CAC) scheduled opening in 2026, conservation was undertaken on a variety of objects selected for display in the new exhibition spaces. As the fellows hired to begin this process, part of our work was the treatment of two carboy bottles. The glass bottles, one clear and one green, were first assembled in the 1980s following excavation from the historic site of the Public Hospital. By the 2020s, the bottles' original use is unclear, the old adhesives were visibly degrading, and no treatment records could be located. Additionally, after decades in open storage in the Archaeology Collections Building, the soon-to-be predecessor of the CAC, the bottles were obscured by surface dust. Over eight months, we examined, documented, disassembled, cleaned, and reassembled the two bottles, becoming familiar with a variety of adhesive reversal methodologies in the process.

There are 138 clear and 187 green fragments, creating the project's first challenge. The sheer number of fragments required a mapping system to denote their locations on the bottles. We created a panorama map for each bottle, on which every fragment received a unique name and a physical label to identify it throughout treatment. We also devised a spreadsheet to track the treatment progress of each fragment. At about two feet tall, these bottles required close teamwork, clear communication, and comprehensive organization.

Another challenge of this project was the unknown adhesives from previous mending. These generously applied, yellowed adhesives were not only visually distracting but also posed risks to the bottles' structural stability. FTIR analyses revealed Duco rubber cement and Epotek 301 on the clear bottle, and epoxies – most likely Fynebond and Epotek 301 – on the green bottle.

We undertook treatment on the clear bottle first, and one of its adhesives proved extremely tenacious. To find an effective treatment method for what was likely epoxy, reversal testing was performed to find ZipStrip (methylene chloride) alternatives. First, hot water and 1:1 acetone and ethanol baths were tried, but both were unsuccessful. Next, four solvent bath combinations were tested with 49 xylenes:45 acetone:6 ethanol proving to be the most effective, which reversed many joins and minimized the use of ZipStrip.

Surprisingly, the green bottle proved much easier to disassemble despite the FTIR results conclusively showing epoxies. Most joins were successfully reversed with 1:1 acetone and ethanol vapor chambers and baths. The few tenacious joins were reversed with 49 xylenes:45 acetone:6 ethanol baths. Testing from the clear bottle treatment provided an effective solvent combination to tackle the stubborn joins, significantly saving time during the second treatment.

The scale and complexity of the project required creativity, collaboration, and eventually tacit understanding between the two of us. Organization was key, with the panorama map and spreadsheet preventing disassociation and ensuring smooth coordination. Reversal testing revealed safer methods for removing epoxies. After much time and dedication, the two bottles are revitalized and ready for display in the new CAC building.

When Conservation Goes For a Spin: Experiences gained and lessons learning from ten years of lifting and rotating large archaeological objects at the Mariners' Museum and Park

William Hoffman

Large archaeological objects can be challenging to manipulate during and after treatment due to a variety of factors including structural integrity/fragility, scale, awkward shape, and weight. These characteristics often occur in combination making it difficult to determine where to make direct-contact to an artifact's surface as well as to identify center-of-gravity and how it will shift as an object is lifted or rotated. Consideration too must be given to minimizing stress to weak points and ensuring that an artifact is adequately secured, so that as it is moved/turned, it cannot physically shift in an uncontrolled/unexpected manner. Due to the need to reach all sides of an artifact during treatment, it is usually unavoidable that it will have to be turned at some point which increases the risk of damage. Ultimately, once an object is conserved, it will have to be placed on a mount and moved into storage or put on exhibition which also has the potential to cause damage. As no two archaeological objects are identical, often what works directly for one object may not for another. However, overarching concepts can apply to numerous objects such as the utilization of multipurpose mounts that can be used over the course of an artifact's treatment. These kinds of mounts minimize the need for physical handling and therefore reduce the risk of accidental damage. This paper will present a series of case studies utilizing primarily USS Monitor artifacts to highlight a range of techniques and methods employed at The Mariners' Museum and Park to lift, turn, and store large archaeological objects over the course of the last decade.

A Treatment Odyssey: The Preparation of 201 Ancient Cypriot Objects for Permanent Display

Emily E. Brown, Tara Johnston; Authors: Emily E. Brown, Tara Johnston, Dimitra Pantoulia

From May 2019 through December 2024, 201 ancient objects from the island of Cyprus were examined, documented, and treated in preparation for permanent installation in The John and Mable Ringling Museum of Art. From 2020 onward, this conservation effort was led by Conservator of Sculpture and Decorative Arts Emily Brown, collaborating with guest curator and Cypriot specialist Joanna Smith and private conservator Dimitra Pantoulia. Along with her own treatments, Emily delegated and managed the majority of this treatment, which was completed by four other conservators working in close collaboration: The Ringling Kress Conservation Fellow Tara Johnston, Objects Conservator Dimitra Pantoulia, and RLA Conservation conservators Elena Bowen and Krista Vaughn. After a brief introduction to the collection and conservation history of The Ringling's ancient collection, this presentation will focus on an overview of the collaborative treatment methodology applied to the 201 objects prepared for permanent display. Material types included limestone, ceramics and terracotta, bronze and precious metals, glass, and gemstones. The talk will include case studies for several treated objects and conclude with a brief post-mortem reflection on the treatment approach, including both successes and lessons learned.

Setting Up Shop: Objects Conservation and Materials Analysis at Pañamarca, Peru

Megan E. Salas

This paper will highlight conservation activities that are part of Paisajes Arqueológicos de Pañamarca (Archaeological Landscapes of Pañamarca), a multidisciplinary and multiyear archaeological research project in northern Peru's Nepeña Valley. Pañamarca was one of the most important monumental Moche centers during the Late Moche period (ca. 600-800 CE). The adobe site is best known for its polychrome wall paintings that depict mythological iconography and human ritual activity. Conservation of the immovable elements of the site, especially the wall paintings, has been a priority since excavations by members of the current team began in 2010. The project expanded in scope and capacity before the 2023 season with funding from the Avenir Conservation Center of the Denver Museum of Nature & Science. This expansion included the addition of more conservation staff and an enhanced focus on objects conservation and materials analysis. The excellent preservation environment at the site means that small finds are plentiful and span a range of materials, from sections of woven plant material to copper alloys. These small finds help to provide a more holistic sense of the archaeological spaces and the wall paintings that embellish the surrounding surfaces. This paper will provide an overview of how objects conservation has developed over two field seasons since 2023 at the site. To date, objects conservation has included both preventive and interventive activities; the paper will highlight examples of both, as well as some of the unique opportunities and challenges the project provides. Materials characterization has emerged as another area of focus for the project. Characterizing the paint palette for the site's wall paintings exposed during excavation began with in situ analysis with portable X-ray fluorescence (XRF) spectrometry. Further analysis with polarized light microscopy (PLM) and Fourier transform infrared spectroscopy (FTIR) has started on samples removed and exported from the site. Objects conservation and materials characterization will help to situate the materials and methods of production encountered at Pañamarca within the broader Moche world.

Forging Ahead: Creosote Removal from the Valley Forge National Park Upper Forge Site

Hannah Sanner; Authors: Hannah Sanner, Curtis Sullivan

Thousands of visitors to Valley Forge National Historical Park in Eastern Pennsylvania have passed by "the forge" while walking the Park's many trails. The forge was constructed in 1742 to finish crude iron "pigs" into hardware and tools. However, in 1777, British forces burned the valley and the forge—a major strategic site—to the ground. The Pennsylvania State Park Service excavated the Upper Forge Site ruins in 1929-1930 before the Park's transition to federal ownership. Until recently, over three hundred wooden fragments of the forge's structure sat in a barn. The artifacts fluoresced bright green under UV and reeked of mothballs—a telltale sign of the petrochemical creosote. The condition of the collection lent itself to a major collaborative research project including the Valley Forge National Park and Harpers Ferry Center in West Virginia.

Before treatment began, we established a triage lab in an open barn to temporarily store the collection. This process required the cooperation of Valley Forge's maintenance staff and Harpers Ferry Center in order to provide the necessary infrastructure and resources. Our greatest priority was to remove the creosote coating, thus allowing the collection to be relocated to a climate controlled environment. Creosote is composed of strong volatile organic carbons (VOCs), which can cause respiratory irritation and damage. Unfortunately, creosote removal scholarship provided little help in devising a treatment plan for the Upper Forge Site. While creosote can be removed on an industrial level using abrasives or water pressure, these methods were not suited to fragile archeological material. The treatment plan had to be designed and tested from the ground up.

The condition of the collection was suitable for comprehensive testing. Boxes of dissociated debris were available for spot-testing. The wood's internal cell walls and structure had long since been destroyed by the outside environment. Fluctuations in temperature and humidity caused the objects to expand, contract, and severely split in the barn. Conservators do not typically recommend submersion baths for archaeological wood for fear of bursting cell walls with fluid. However, the Park was more comfortable with pursuing wet treatment because the collection had already undergone this damage during storage.

After I conducted analytical testing at the Harpers Ferry Lab, I employed triage-style processing at the Park. I treated the wooden artifacts using a combination of solution, mechanical, and poultice cleaning. The creosote removal also yielded new residue-limiting poulticing techniques. I encountered challenges during the numbering process, which required the insight of conservators across multiple states. The project concluded with a modular storage method, also designed by a committee.

The Upper Forge Site project was an experiment in collaboration. Craftsmen, curators, preservationists, conservators, and analytical scientists across the federal government provided their expertise to the protection of this historically significant collection. Within a year, we had relocated the forge fragments from a barn to a climate controlled archive. Historical research has been compiled for the eventually interpretation, exhibiting, and possibly even reconstruction of the revolutionary forge.

Architecture

Solution from Nature: Psyllium Husk as a Biological Amendment for Soil-based Shelter Coat Protection of Earthen Heritage

Jiwen Fan

By drawing inspiration from the traditional practice of amending earthen plaster with natural organic additives, this study explores innovative possibilities of biological amendments inspired by other disciplines for the conservation of earthen built heritage.

Psyllium husk, a plant-based polysaccharide, is traditionally harnessed for medicinal purposes and has recently gained attention in civil engineering and agronomy as a natural soil stabilizer. This research studies psyllium husk as a cross-disciplinary biological amendment for soil-based shelter coats on earthen structures. Through laboratory testing, we examined the physico-mechanical properties of soils amended with psyllium husk and evaluated its potential as a sustainable alternative to modern synthetic amendments.

Earthen heritage represents a global building tradition that has remained viable for millennia. Key advantages of earthen construction include local availability, low cost, and minimal environmental impact; however, earth is highly sensitive to climatic factors, especially moisture. The increasing intensity of rain events due to Climate Change threatens the stability of earthen heritage in traditionally arid regions. For over five decades, synthetic organic polymers have been used as amendment for the conservation of earthen materials. However, the effectiveness of such materials depends on soil composition and low moisture levels. With clean soil being a dwindling non-renewable resource, they also present issues such as incompatibility, irreversibility, and low sustainability. These limitations have prompted a search for alternative solutions that better address diminishing resources and a changing climate.

Biological materials, rooted in traditional building practices, offer promising alternatives. Historical examples, such as the use of animal blood and cactus pulp by indigenous and Hispano builders in earthen construction, demonstrate the potential of biological materials in enhancing soil stability. Modern lab-engineered materials like nanocellulose offer controlled quality and environmental benefits. Recently, fields like agronomy and civil engineering have developed commercial products that are readily available, cost-effective, and easy to use. Literature research identifies psyllium husk as a promising candidate.

Further evaluation focused on water erosion resistance and compatibility with raw-earth structures. Three stages of laboratory testing were conducted: soil characterization, shelter coat formulation, and performance testing of the amended soil. Testing procedures were designed based on various industry standards, while analytical techniques like X-ray diffraction and SEM-EDS provided deeper insights into the mechanisms of psyllium husk as an amendment and its effects on soil mineralogy and other critical properties.

Results show that psyllium husk performs comparably to synthetic amendments in enhancing the water erosion resistance of soil-based shelter coats. It also demonstrates improved compatibility and potentials of reusability. These findings suggest that psyllium husk could be a viable, sustainable alternative to synthetic materials in the conservation of earthen structures. The study also opens avenues for further research, including field testing, exploring diverse application methods, and investigating synergies with other amendment materials.

Beyond specific findings on psyllium husk, this research highlights the promising implication of applying biological material to conservation. By integrating materials and techniques from other fields, we can develop more feasible, sustainable, and adaptive strategies to address contemporary challenges such as Climate Change and diminishing resources.

Heat, Humidity, and Pressure: Leveraging Techniques from Other Disciplines to Preserve Graffiti and Architectural Paints at a Historic Prison Museum

Meris Westberg

In October 2023, conservators from Jablonski Building Conservation (JBC) performed a uniquely challenging paint stabilization treatment to preserve prisoner graffiti on thickly layered, severely distorted architectural paint applied to the brick and plaster walls of the Burlington County Prison Museum in Mt. Holly, New Jersey. The prison was completed around 1811 and was in continual use until 1965, with cell walls covered in 50-100+ layers of accumulated whitewash, distemper, and oil paints. Temperature and humidity fluctuations, water infiltration, changes in use, and structural repairs have culminated in the loss, deterioration, and distortion of much of the site's intriguing and extensive prisoner graffiti on the dense paint finishes.

Guidance and research on flattening is widely available for other media such as paper, painted artworks, and decorative arts, but is almost nonexistent for architectural paint – particularly in a vernacular and arrested decay setting such as at the Burlington County Prison Museum. So, to improve legibility and increase surface area for securing paint fragments to the walls, JBC drew on techniques used in paper, paintings, and objects conservation by using heat, humidity and pressure to relax the most severely curled paint fragments. This unconventional treatment approach devised by JBC for the Burlington County Prison Museum exemplifies the value of leveraging techniques and knowledge from other disciplines, while amplifying the unique challenges of performing conservation treatments on architectural finishes in an uncontrolled environment.

This presentation will elaborate on JBC's approach, techniques, challenges, and results of the paint and graffiti preservation campaign at Burlington County Prison Museum and invite a broader discussion across disciplines about existing research, techniques, and case studies that could help inform similar architectural finishes conservation projects and research in the future.

Bridging the Gap Between Real and Virtual: A Digital Interface for a Building Materials Collection

Jose Hernandez

The Historic Building Materials Collection (HBMC) is a repository of material samples collected from historic buildings and sites around the world. It serves as a resource for architects, historians, conservators, and scholars seeking access to traditional and historic building materials, ranging from the vernacular to high-style structures, including archaeological sites. The collection's core function is to facilitate direct access to physical material specimens and enable advanced analysis, such as cross-section and thin-section microscopy, providing critical insights into the materials' composition, structure, and history.

However, with the physical collection outgrowing its designated institutional space, the need for a more efficient, user-friendly way to access and manage these materials has become urgent. Handling these historic objects too frequently increases their risk of damage, and traditional archival methods do not provide the discoverability or ease of access required for research. This has driven the need to create a digital interface that offers scholars and visitors the ability to explore the collection by cross-referencing, reduce wear and tear from handling the physical specimens, and boost awareness and engagement with the collection to a larger audience.

The digital interface for the HBMC acts as a searchable and query-able repository, allowing users to navigate the collection through various filters, such as material composition, building or site, object type, or date range. This repository streamlines the process of discovery by enabling users to explore and gather relevant information without physically handling the objects. Each specimen within the collection is assigned a unique object ID that encodes its material composition, site of origin, and date of creation, a redundant step that protects the integrity of the collection against loss of data. In addition, the unique ID links the specimen it to its virtual record, which expands with a narrative of the

object, as well as its inherent deterioration conditions, previous research done, and any associated objects.

In addition to making the research process more efficient, the digital interface serves as a preservation tool. By moving the initial task of discovery to a public website, it is expected an increased awareness of the collection while minimizing the frequency of physical handling of the samples. Users can access high-quality images, 3D scans, and detailed metadata of each object, and only request physical access once objects have been identified. This system of controlled access not only protects the specimens from potential damage but also supports long-term conservation efforts.

The digital repository will support embedding analytical data to common constituents found in historic building materials, such as particle size distribution of an aggregate or the molecular spectrum of a known pigment, providing scholars with relevant scientific data immediately.

By combining digital technology with traditional archival methodologies, this interface will not only prolong the physical preservation of the collection but also facilitate research in conservation, enhancing the study and understanding of historic building materials.

Partners in Preservation: The importance of collaboration during construction at the Lower East Side Tenement Museum

Stephanie Hoagland

In preservation, where recreated historic interiors are a norm, we know nothing tells the story quite like the real thing. The Lower East Side Tenement Museum in New York City has recently completed a multi-year, $7 million capital project to make the building more energy efficient, upgrade its HVAC system, restore the exterior masonry, and add strengthening materials to make the building more structurally sound. Although the museum did add a recreated apartment, conservators spent over 12 months preserving the paint, plaster, and wallpaper of the original "ruin" apartments.

The Tenement Museum is a five-story brick building located in a neighborhood densely packed with tenements and factories and was historically a first home for those new to the United States. Between its construction in 1863 and the 1930s, immigrants from over 20 countries lived in the tiny apartments of 97 Orchard Street. Instead of making additional alterations to meet changing housing codes in 1935, the landlord chose to evict all the tenants and sealed off the upper floors, leaving them uninhabited until 1988 when the museum took over the building. As a result, these apartments became a time capsule of immigrant life in America. The museum is unique in both its interpretation of the building and its occupants over time as well as its treatment of the ruin apartments in a state of "arrested decay" with their peeling wallpaper, curled plaster, bare wood, and faded linoleum. In addition to retaining the authenticity of the apartments, retention of these finishes assists in telling the story of the people who lived there, including changes in aesthetic tastes over time.

Conservation work began prior to construction to install protection around historic fabric in areas of selective demolition. As time and funds were limited, conservation treatments to each room of each apartment could not be performed. The conservator and museum worked together to prioritize rooms and apartments based on location, remaining historic fabric, and future programming needs. This resulted in conservation treatment being performed in ten of the fourteen apartments accessible to the public. The opening of floors, walls, and ceilings was required for the installation of structural I-beams and sistering joists. This required additional collaboration with the contractor to ensure the openings were created in locations that would have the least impact on the historic fabric.

Visitors often remark that the ruin apartments are their favorite. In these spaces there is a direct visceral connection to the past: people lived in these rooms, walked these floors, and touched these walls. Retaining that connection is vital to the museum's mission.

This paper will discuss the importance of the collaboration between all parties involved in the project and will discuss some of the conservation challenges in stabilizing the ruin materials and making them safe for visitors while retaining the look of abandonment at the Tenement Museum.

It takes a village to save an American Treasure: Preserving the Swimming Pool Grotto ceiling mural at Vizcaya Museum and Gardens

Davina Kuh Jakobi

A National Historic Landmark located in Miami, Vizcaya Museum and Gardens was constructed between 1914 and 1922 and features 14 distinctive structures. Though there are numerous highly decorated and site-specific spaces throughout the estate, the Swimming Pool Grotto is a particularly unique feature. Containing a ceiling mural painted by the distinguished American artist Robert Winthrop Chanler in 1916, it portrays a vibrant "undersea fantasy" that provides an immersive experience. A testament to Chanler's distinctive, playful style, it is only one of only three publicly accessible Chanler murals in the United States.

However, the Swimming Pool Grotto at Vizcaya represents a particularly significant conservation challenge due to its unique design and the environmental pressures it faces, and surface deterioration was visible as early as 1918. The mural's deterioration is particularly severe due to Chanler's use of water-soluble paints, Plaster of Paris, aluminum gilding, and glazes ill-suited to the humid, coastal environment. These materials have led to significant paint loss, plaster detachment, and extensive damage. Recent assessments have also revealed corrosion in the underlying structural elements, adding to the urgency of the preservation work needed. Over the past 15 years, Vizcaya has meticulously documented the mural's declining condition while embarking on a comprehensive conservation survey, undertaking a preliminary assessment in 2012, a structural systems analysis in 2014, a comprehensive condition assessment in 2017, and an environmental survey in 2023. In 2023, Vizcaya engaged an external conservation firm to address flaking throughout the painted surface and undertake a sample treatment area while simultaneously commissioning contractors to analyze the necessary repairs to the ceiling substructure and the Living Room floor above. The findings from these recent evaluations have emphasized the urgent need for more drastic intervention.

In 2024, Vizcaya was awarded a $750,000 Save America's Treasures grant as administered by the National Park Service, Department of Interior. With a $750,000 match, this will enable us to perform necessary work to the substructure of the Living Room floor above the mural. This marks a transformative step forward in this conservation endeavor. This funding will support critical interventions, including structural repairs to the Living Room floor above the mural, which are essential to stabilizing the Grotto and ensuring the preservation of its artistic and historical integrity.

This presentation will discuss the extensive years-long preparatory work as well as the first phase of the work in the Living Room above that must be undertaken prior to the upcoming mural conservation. It will highlight the interdisciplinary collaboration that has been required to address the Swimming Pool Grotto's complex conservation issues, encompassing research and analysis, structural engineering, and architectural conservation techniques, specifically cathodic protection. By sharing insights into the challenges faced and the collaborative strategies employed, this presentation will underscores the vital role of multi-disciplinary professional collaboration in the preservation and conservation of environmentally challenging and historically significant sites, showing that it indeed takes a village to save an American treasure like the Swimming Pool Grotto at Vizcaya Museum and Gardens.

Proposing an Alternative Methodology for Hurricane-Related Vulnerability Assessments of Built Heritage in Puerto Rico

Andrés Santana-Miranda

For various decades, countless natural threats —particularly hurricanes— have assailed Puerto Rican built heritage. Even in recent years, the effects of climate change have increased the intensity of these phenomena. Besides all the havoc, the recurrence of these events threatens the conservation of built heritage. However, climate change is not the sole risk factor for historic properties. Factors such as planning and preservation policy, urban development,

and financial stability further exacerbate the vulnerability of historic buildings in Puerto Rico. As a potential step forward, vulnerability assessments are a proper tool to understand the vulnerability of historic sites from climate change vis-à-vis these external factors. Vulnerability assessments (VAs) generally allow exploring how ecosystems, communities, and historic properties are vulnerable to a changing climate. In the long-term process, VAs help identify potential mitigation and adaptation measures that contribute to decreasing vulnerability and protecting resources for long-term resiliency. Nevertheless, most of these existing tools focus on a particular historic resource and its specific conditions. This approach complicates the possibility of applying a protocol on a larger scale to other historic sites and resources because it overlooks the socioeconomic, cultural, and political histories, decisions, and processes that can aggravate the vulnerability of an overall region.

Considering the strengths and limitations of the existing heritage-focused tools, this paper proposes an alternative and experimental framework for VAs that addresses how general external factors beyond the particularities of a specific historic site can further influence the vulnerability of historic properties of an overall region. The methodological alternative is based on a multidisciplinary analysis of the geographical and historical complexities of the Central Aguirre Historic District in the southeastern municipality of Salinas in Puerto Rico, a former sugar mill company town that functioned from 1899 to 1990. A set of overarching questions about Puerto Rican history and the historic district's conditions led to the development of the alternative VA protocol, composed of different indicators and criteria that range from policy, economy, conditions, and social issues. This proposal facilitates the calculation of the climatic vulnerability of Puerto Rican built heritage in general, quantifying the vulnerability of historic properties vis-à-vis environmental, political, sociocultural, and historical conditions in the archipelago. An applied protocol test with twenty properties out of the over four hundred properties of the historic district demonstrated how varied circumstances (such as ownership, current conditions, materials, and use of incentives) can sway the vulnerability of historic properties despite exposure to climatic risks. In the end, this result captures how the proposed framework can respond to the environmental and historical particularities of the archipelago when trying to understand the vulnerability of historic properties regardless of their location.

Colored Expectations, Whitewashed Reality: A.J. Downing's Influence and the Surprising Palette of Ivy Lodge

Nicola Macdonald

Esteemed American horticulturist and author of The Architecture of Country Houses, A.J. Downing played a pivotal role in the emergence of the American Picturesque movement of the mid-19th century. His ideals are expressed in the minutiae of material usage and finishes as well as in the pattern books that resulted from his influence. Over time, his work has shaped scholars' understanding of the architectural colors of the period. Despite A.J. Downing's well-documented influence on the American Picturesque movement, little empirical research has been conducted on the actual use of color in architecture from this period. Most existing studies are unpublished and largely inaccessible, creating a gap in our understanding of how Downing's theories were applied in practice. Ivy Lodge, a key example of mid-19th-century Italianate architecture in Philadelphia's Germantown neighborhood, offers a rare opportunity to analyze original finishes that have remained largely intact. By examining the paint layers and comparing them with Downing's pattern book prescriptions, this study not only challenges prevailing assumptions about his influence but also provides crucial insight into the material culture of the American Picturesque. The findings contribute to the field of architectural conservation by offering new data on historic color practices, helping to refine our understanding of 19th-century American aesthetics and their practical applications. Using cross-sectional and polarizing light microscopy to analyze paint samples, the paper illuminates the chosen color palette. It offers perspective on the actual influence of pattern books and Downing's specific prescriptions for color during the American Picturesque Movement.

The analysis of Ivy Lodge's paint layers reveals a dominant early finish of white lead-based paint rather than the anticipated earthen tones displayed in Downing's pattern books. Later layers introduced colors like gray, brown, and green, aligning with the period's broader palette. Differences in stratigraphy among windows and exterior details suggest varying approaches to trim and cornice paint, with some dark gray paints appearing in isolated areas. These findings challenge the assumption that Ivy Lodge's color scheme followed A.J. Downing's recommendations for the American Picturesque Movement. While Downing advocated for natural tints and rejected white exteriors, Ivy Lodge's white-painted trim more closely aligns with earlier Colonial and Georgian aesthetics, suggesting that the homeowners may have blended Downing's ideals with prior influences. Furthermore, the later introduction of Picturesque colors in the 1870s, post-Downing era, implies that his influence may have expanded over time rather than being immediately adopted. This study broadens our understanding of mid-19th-century American architectural finishes, questioning the extent of Downing's impact on contemporary color choices.

Importance of Planning, Research, and Material Testing in Maintaining an Oldest Public Wood-and-Glass Greenhouse in the United States

Mayank Patel

Originally constructed in 1879, the Conservatory of Flowers in the Golden Gate Park in San Francisco, California is a rare example of the wood-and-glass conservatory in the late Victorian style constructed using early techniques of mass production and assembly of simple glass units. Following extensive wood decay and significant windstorm damage, the building underwent extensive restoration and structural upgrades from 1998 to 2002.

Preserving and maintaining an active greenhouse is no easy task, and working around plants that cannot be moved or environmental conditions that cannot be drastically altered calls for careful planning and thorough research and material testing, even for the simplest tasks, such as painting. This presentation aims to review some of the unique challenges that we have come across during our three decades of work at the Conservatory of Flowers and the rigorous planning and research we had to conduct to extend the maintenance window of the building while having minimal impact on its unique aesthetic and the collection of rare and exotic plants. Two projects we aim to discuss are the replacement of failed glazing putty with silicone extrusions and surface preparation and painting mock-ups in the Conservatory's Aquatic Plants gallery. They provided opportunities to consider and evaluate alternate solutions for longevity, durability, and appropriateness to the unique environment of the Conservatory of Flowers.

Panel on Laser Cleaning on Masonry Materials, Lessons Learned

Speakers: Kelly Caldwell, Judy Jacob, Adam Jenkins, Walter Kesaris, Holly Salmon

Join our second annual examination of practice panel at the 2025 Meeting. This year, we will dive into the topic of laser cleaning on masonry to look at the development and efficacy of treatments both past and current. Panelists will introduce the mechanics of laser ablation before moving into a Q+A session meant to spark conversation on the successes and limitations of this approach for cleaning masonry materials. This is intended to be a collaborative event, gathering colleagues and their valuable insights from all specialty groups. We hope to see you there!

Architecture | Preventive Care

Understanding the Problem and Defining the Goal: Environmental Assessments in Historic Buildings and Collections in the NPS, Region 1

Margaret D. Breuker

"Understanding the Problem and Defining the Goal: Environmental Assessments in Historic Buildings and Collections in the NPS, Region 1"

Historically within Region 1 in the NPS, environmental problems within historic house museums were dealt with by either complete replacement of their HVAC systems or by the installation of new, sometimes invasive systems that could fix the perceived problem. However, this problem was often not fully identified, or not well defined from what was originally perceived as the initial issue such as a mold outbreak, high or low humidity, or too high or low temperatures. Additionally, the condition of the collections was not examined for evidence of environmental damage. Now, the Historic Architecture, Conservation, and Engineering Center (HACE) in Region 1, has developed Environmental Assessments that, often with the assistance of contracted professionals, assess the historic building envelope, collect environmental data, and examine the condition of the collections contained therein, to determine any problems and to define the goal of the interior environment before a solution is implemented.

Too often, condition problems in historic house museums are viewed as solvable by the implementation of controlled HVAC systems. Mold outbreaks or uncomfortable summer or winter conditions are the impetus for system upgrades. However, without examining the current condition of the buildings and exhibited collections in greater detail, as well as the behavior of the building to the ever-changing exterior environment, we cannot know how to effectively solve any system problem. These Assessments use targeted systems-wide evaluations of the building envelope and building systems to fully understand the current environment. Evaluations such as envelope condition assessments, differential pressure testing, scoping of ductwork and chimneys, thermal imaging, pollution monitoring, temperature and humidity data analysis, moisture monitoring, and other data collection that might inform decisions and shed light on observed conditions.

The objective of these assessments is to propose what environmental parameters can reasonably be maintained in the Region's uninsulated historic exhibition buildings. This can be achieved by thoroughly understanding the building design, and the current quality of environment the building has been able to achieve. This approach has been taken with numerous historic buildings in Region 1 of the National Park Service over the past five years, such as Lindenwald, the home of Martin Van Burren; the Vanderbilt Mansion in Hyde Park, New York; and the Rockefeller Mansion in Woodstock, Vermont. The projects are supplied with specific funding for the purpose of determining the best possible outcome of system replacement for these historic buildings. Smaller condition assessments of collections have also been implemented as requirements for changes or upgrades to building systems of any kind to ensure that the interests of the collections and building fabric are considered during system design. It is the hope of the author that these Environmental Assessments be viewed as baseline documents for any historic building, just as Historic Structure Reports (HSRs), Historic Property Project Documentation (HPPD), or Historic Furnishing Plans (HFPs).

Building Together Better: Establishing Dynamic Models for Collections Storage Planning at The New York Public Library Research Libraries

Rebecca Fifield

Planning one storeroom with integrated preventive conservation controls is admittedly a complex endeavor. But how do large organizations undertake comprehensive storage planning, especially when they have fifty storage areas of 250,000sf in three historic Manhattan research centers (plus a giant high-bay storage facility in New Jersey)? How does an organization begin to steer planning to meaningfully incorporate climate action methodology and build resilience systems? What coaching, education, and facilitation are needed to redirect a storied institution from localized episodic planning to a powerful and pervasive strategy to protect collections?

The Research Libraries for the New York Public Library (NYPL) is building a foundation for dynamic storage planning for a changing world. Large institutions need to focus on global, values-based thinking when building or renovating collections storage to equitably incorporate sustainability and preservation concepts. With support from the Sustaining Cultural Heritage Collections (SCHC) program of the National Endowment for the Humanities (NEH), NYPL designed a collaborative pre-planning exercise to inform long-range collection storage planning. A project team of NYPL stakeholders and experts in cultural heritage architecture, preservation environment, and sustainability collaborated to establish a path toward a more responsive and ongoing storage planning model. The project included a week-long walkthrough of all storerooms, followed by several months of distillation of these observations. The project established in its report foundational planning tasks, maintenance tasks, and capacity concepts for exploration in future storage planning.

This talk will discuss building a unified momentum through sustained institutional messaging, risk-taking, and taking advantage of key moments. A specific area of focus will include relationship-building between collection management, facilities, capital planning, energy, health and safety, and curatorial staff to build trust and create space for planning. Discussion of the pre-planning exercise will highlight conditions NYPL is attempting to address, concepts the pre-planning team used for structuring their observations, and logistical practicalities of planning this type of onsite assessment.

Building on the success of the pre-planning grant, NYPL received a second NEH SCHC grant in August 2024 to develop the Collection Space Construction Design Standard. NYPL will convene experts in architecture, mechanical engineering, electrical engineering, fire protection, security, and sustainability, to create construction design standards for reading rooms, storage, and collection workspaces that will be made available to other institutions. This presentation will also include an update on this project, as well as collection storage's high-level inclusion in NYPL's new strategic plan.

Preserving Ukraine's Cultural Heritage during Russia's Invasion

Marila Salyuk

The onset of Russia's war against Ukraine on February 24, 2022, demonstrated the country's government unprepared to protect its cultural heritage from destruction. And yet, in the early days of the invasion, members of the non-governmental Society for the Protection of Historical Monuments in Lviv rose to this existential challenge. They organized the city populace and, at their own expense, procured protective materials and implemented strategies to safeguard vulnerable cultural heritage sites. This grass roots effort then became a role model for other communities, quickly spreading throughout the country. International organizations also became involved, providing risk assessment strategies, additional materials, and sophisticated instrumentation to document war damage and implement a preventive conservation program. My talk will shed light on this evolutionary process, the role of conservators in it, and outline pathways for the future.

Let There Be Light (Or Maybe Not)

Gretchen Anderson

There are always challenges for collection care, particularly in a historic building. The Carnegie Museum of Natural History is no different. The building was constructed as a museum, music hall, and a library in 1898. There have been several expansions and reorganizations since then, including a major expansion in 1907 and an expansion for Art in 1974. The building complex now houses a public library, music hall, Carnegie Museum of Pittsburgh (CMP) offices, the Museums of Art (CMOA) and Natural History (CM). The library and music hall are part of the complex but are separate entities. The museums and the music hall facilities are taken care of by the CMP Facilities, Planning and Operations (FP&O). The building complex is on the National Register of Historic Buildings.

In preventive conservation, we consider the building envelope as the first line

of defense for collection care. Finding the time, resources (staff and money), and setting priorities for repairing gaps in the 125-year-old building is challenging. The roof, walls and windows leak and the numerous environmental systems undergo constant repair. FP&O does an incredible job, but their priorities often differ from ours.

We recently had the opportunity to prototype a new method for improving some of these leaks in the bird collection. The bird collection has large casement windows original to the 1907 building. The windows were covered with blackout shades. Cabinets were backed up to the windows and radiators, exposing collections to temperature extremes. When I arrived in 2009, the blackout shades were disintegrating. The windows behind the cases leaked – both air and insects. Working with the new collection manager (Serina Brady) and our head of operations, we developed a strategy to improve the situation, while respecting the historic structure.

We approached the problem as a collaboration between the conservator, collection manager for the bird collection and new operations manager, discussing each step as we moved forward. Interior storm windows were constructed, and new blackout curtains were made, all in-house to save money.

This paper will examine the efficacy of the strategy we employed. It will look at process, resources, and the advantages/disadvantages of what was done. Did the methods we used make the much-needed improvements to the environmental conditions of storage? Was the time and money we spent worth the effort? There are several other collection storage spaces that are faced with the same challenges. Can we use this strategy to make improvements in these spaces as well?

Common HVAC Issues and ways to avoid or correct them

Christopher Cameron

Heating ventilation and air Conditioning (HVAC) systems are an integral part of our collection facilities. We rely on them to acclimatize our storage spaces, keep our visitors comfortable and happy, condition our displays, and keep the moisture under control to prevent mold in our buildings. When these systems function properly all is bliss, however, even the slightest malfunction of these systems can have a major effect on a collection space. These effects can range from high moisture levels, the inability to achieve set points, to comfort complaints from visitors.

These problems can lead to thousands of dollars in abatement or remediation and potentially cause damage to collection materials. Many HAVC issues are more common than most would believe, impacting collecting institutions as well as commercial facilities across the country every day. Compounding this problem is the fact that many institutions are striving to reduce their carbon footprint and be more sustainable. Unfortunately, inefficiencies can negate the benefits of any implemented sustainable strategy by forcing a system to use more energy to perform a task that it is struggling to achieve. While these issues can keep staff members up at night, there are ways to avoid HVAC malfunctions and practical solutions to resolve many of them.

Collections staff may be the first ones to notice that something is amiss within storage and display spaces. Data monitoring programs and staff presence in the collections spaces often help them identify issues or concerns before the facilities staff can see them. This information can help the facility's team resolve the problem.

This presentation will cover many of the common HVAC issues that collecting institutions encounter from leaking condensation lines to high dew points. It will describe the causes of these issues including, but not limited to, congested drain lines, cooling coil inefficiency, poor airflow and dew point problems in a space. The presentation will also elaborate on the risks these issues pose to the facility and collections, and some ways to avoid or correct them. Attendees will learn how other institutions work to solve these problems, how to collaborate with facilities and their administrative team to solve them, and what some of the solutions are that they can bring back to their organizations.

Flood Barriers: Examining and Improving Flood Preparedness at Museums and Sites in Historic Buildings

Meris Westberg

More cultural heritage sites across the United States are at risk of flooding than previously recognized due to the escalating effects of climate change. The National Flood Insurance Program, which is responsible for mapping and communicating flood risk to citizens, has had little impact on the cultural heritage stewardship community. As a result, there is generally low flood risk awareness, low flood insurance take-up rates, and minimal investment in long-term adaptation among site and collections stewards. More sophisticated, accessible tools for understanding flood risk are now available and should be leveraged to promote a culture of flood preparedness within the field.

As disaster planning is becoming increasingly integrated into cultural heritage site management, most preparedness resources focus exclusively on collections, largely omitting consideration for the historic structures which house and are the backbone of many sites and collections. This may be because strategies for preparing historic structures for flooding require specialized knowledge of historic architectural systems, building codes, and preservation standards that collections stewards do not have - particularly at smaller sites and institutions.

The historic preservation community, conversely, has not sufficiently committed to developing and supporting preparedness guidance which integrates structures preparedness with the complexities of site and collection management. What guidance is available on flood preparedness for historic structures is written primarily for private property owners and is deferential to the Secretary of the Interior's Standards, which do not formally promote adaptation.

This presentation, based on a larger masters thesis project, therefore examines what flood preparedness guidance for historic structures at cultural heritage sites does exist and recommends how the cultural heritage stewardship community can improve and promote flood preparedness before their irreplaceable historic museums and sites, and the collections they support, become functionally obsolete or lost due to flood risk.

Book & Paper

Expanding Access: Inclusive Conservation and Education Engagement at The UK National Archives

Natalie Brown; Authors: Natalie Brown, Sarah Petter

The Collection Care Department at The UK National Archives ensure the continued access to 11 million archival records. But the idea of 'access' within a heritage context is changing as organisations work to become equitable and inclusive spaces. As a result, our preservation decision making is changing with this, aided by a dedicated engagement team within the department.

Historically, conservation was rarely at forefront of public or institutional view, and to our detriment, we were often viewed as a barrier to increased access. Over the last three years however, we have made a concentrated effort to shift this narrative towards one of partnerships and mutual benefit, innovative heritage science and conservation practice that has wide appeal, and collective responsibility to care for our collection.

This presentation will focus on a key area of our ongoing work – supporting increased engagement with school aged children and audiences with additional needs. Through several case studies we explore how we are trying to meet the needs of these audiences; increasing the reach of our work digitally as well as through onsite displays; and building deeper relationships through effective engagement activities based on the materiality of our collection and role of the conservator. These include:

* A collaboration with education researchers, teachers, museum education teams, and heritage scientists across the UK to align heritage science to the UK primary school science curricula. We investigated how heritage science can help to break down silos between the teaching of arts and sciences, creating curricula maps and lesson plans that can be led by non-specialist museum staff and teachers.

* A collaborative research project exploring how multisensory experiences can be used to access, engage with, and understand the materiality of archival collections. Through this already impactful pilot project we are now working with SEND specialists to centre materiality in our SEND education lessons; we are also working with our outreach team to deliver enriching activities for people who have dementia based around smell; we are collaborating with PurpleStars, a group of researchers with and without learning disabilities, to develop inclusive and empowering research practices based on materiality of our collection; as well as creating multisensory, inclusive displays.

* Our object lessons for 'high use records' used regularly by our Education team to approach holistic decision making for access. Here, we bring together multiple internal and external stakeholders to create audience driven decision making frameworks that not only support our conservation team's work, but also accountability and responsibility across the organisation.

* A project to create lesson plans with increased tactile access for students who are partially sighted or blind. This novel project challenged our assumptions on how our records will be used.

Each case study will include an overview of the projects, focusing on the collaborative approach of each, as well as their benefits and challenges. More broadly, the presentation will also reflect on how we navigate internal relationships within a large organisation with competing priorities to create these opportunities, and how we built processes to evaluate the impact of our engagement activities.

Blueprint for Growth: A Journey of Architecture Designs

Sanira Karim Gani, Tay Jam Meng

The National Library Board (NLB) and National Archives of Singapore (NAS), together with the Urban Redevelopment Agency, Singapore's urban planning authority, embarked on an extensive 5-year architecture collecting project in 2023. The momentous effort primarily seeks to encapsulate the history of prominent architecture designs in Singapore. The paper-based items included sketches on translucent tracing and butter paper, building plans, watercolour presentations, diazo prints, and printed images on copier paper.

The conservators from Archives Conservation Lab (ACL) of NAS play an essential role in this cross-functional collaborative project. Two conservators were engaged to support this project in carrying out conservation treatments and re-housing of the plans, which numbered 75,000 pages in the first round of collecting. From conceptualizing the storage of the items given their large format, to formulating a decision-making matrix for conservation approaches, close consultations with the donors team who were in charge of the collecting was extremely important, particularly in setting up new workflows for this unique collection. A one-size-fits-all approach did not apply here as each donated box of plans came with different conditions and required customised attention. It was imperative to streamline decision-making and prioritise treatment and housing solutions for the collection that was coming to the lab in staggered bursts. Such efforts provided much clarity for conservators who were new to the profession as well as for our colleagues in the donors team so that subsequent batches of plans could be processed, conserved and housed efficiently, with purpose and confidence.

The initial tranche of this project also culminated in an exciting exhibition, the first of a planned few, 'To Draw an Idea: Retracing the Designs of William Lim Associates – W Architects' which exhibited over 550 multifarious design drawings covering 19 contemporary architectural projects from 1981 to 2015. ACL supported this exhibition by working closely with the curators from the planning and ideation, condition assessments and installation stages – all of which required innovative problem-solving. Every exhibition is different, and conservators increasingly must find a balance that works when working in unconventional exhibition spaces– without compromising the preservation needs of the items.

The Architecture Collection Project is an example that emphasises that the role of conservators today has transformed beyond simply providing one-off exhibition or conservation support. Collaboration with all stakeholders and partners means advocating for conservation principles, while balancing them sensibly with practicality and feasibility to ensure that objectives are met, and outcomes are achieved successfully for all groups involved. It sets the foundation for greater camaraderie among different functional groups and stakeholders, built on understanding, engagement and synergy.

Archivists and Conservators: An Unlikely Love Story

Laura McCann, Weatherly Stephan

In this presentation, an archivist and a conservator will share their experiences working and learning together over the past decade, as well as their research on a persistent communication gap between their professions. This gap often leads to missed opportunities for collaboration that could benefit archivists and conservation, as well as the collections and the communities they serve. The gap widened in the wake of the seminal archival management article "More Product, Less Process," published by Mark Greene and Dennis Meissner in 2005, which advocated for more efficient practices to reduce backlogs and make collections more accessible. In this article, conservation activities were portrayed as excessive and unnecessary. As a result, many archivists became dismissive of conservation, leading to tensions and a sense of misrepresentation within the conservation community.

The presentation will introduce a model for integrating preventive conservation into a holistic collection management program. When building new workflows for archival accessioning and processing, the presenters worked together to proactively develop local standards for collection management. These standards address known legacy issues and improve collections care work going forward.

This model emphasizes the importance of archivists and conservators learning each other's professional ethics, standards, and training to improve communication and foster more effective collaboration, while embracing humility, curiosity, and mutual respect. This learning occurs through committee work, reading groups, collection planning meetings, after action reviews, and events. Open discussion of our different priorities and perspectives pave the way for creating institutional programs that promote ethical, sustainable collection stewardship

and have the potential for improving work experiences. The presenters will tell the stories of successes and challenges faced in their collaborations.

Manuscripts that multiplied – stories from the parchment partnerships

Fenella France; Authors: Fenella France, Meghan Hill, Anna Hoffmann, Pádraig Ó Macháin, Cynthia Connelly Ryan

Multidisciplinarity draws on knowledge from different disciplines, but the context remains within those disciplines' boundaries. Interdisciplinarity analyzes, coordinates and links knowledge between disciplines into a coherent composite. Inks&Skins https://inksandskins.org/ started as an interdisciplinary project dedicated to investigating the materiality of late-medieval Gaelic manuscripts but became so much more. The diverse groups involved expanded the research scope into that of transdisciplinarity, fully integrating the industry, conservation, manufacturing, heritage science, and scholarly research into a humanities context that transcended traditional boundaries of each of the disciplines. While multidisciplinary and interdisciplinary are additive and interactive respectively, transdisciplinary is holistic.

Sponsored by the Irish Research Council, Inks&Skins set out with the goal of increasing our understanding of the substrate (parchment) and the composition of inks and pigments used by secular scholars who created Gaelic vellum books in the period 1100-1600. The intent was to focus on one manuscript, the Book of Uí Mhaine, a large vellum manuscript of poetry and Irish tradition assembled c. 1390 for the Ó Ceallaigh (O'Kelly) family of Uí Mhaine in County Galway, Ireland. The synergy of more collaborating partners enriched the scope. Preservation Research and Testing Division (PRTD) Library of Congress (LC) staff, as part of an MOU with University College Cork (UCC), undertook multispectral imaging (MSI) at the Royal Irish Academy (RIA). The MSI was intended to only be on the Book of Uí Mhaine. However, engagement through sharing initial processing to read text through stains led to further manuscripts added to the docket, including Ireland's oldest book, 'The Cathach, a late 6th-century Psalter. Entrusting Inks&Skins with access to these precious manuscripts underlined the commitment of the Royal Irish Academy as partners in this innovative work.

Then the pandemic arrived, and we adapted to moving forward on collaborative research remotely. Data sharing challenges were but one of the barriers we had to work through. Industry partners in Ireland assisted with X-ray fluorescence spectroscopy (XRF) of the RIA manuscripts and then sent the data to PRTD for interpretation. Exhausting all we could from MSI and XRF data still left challenges with understanding the organic components of the inks and pigments in the manuscripts. PRTD staff created new ink and pigment reference samples for the Center for Heritage Analytical Reference Materials (CHARM). Utilizing instrumentation at LC, we essentially worked backwards to link fiber optic reflectance spectroscopy (FORS) reference curves with what we had captured from the MSI on the manuscripts. The addition of collaborators continued to expand the wealth of information extracted from the data. Connecting the MSI processed images of the manuscripts with Trinity College conservators, parchmenters and creators, greatly assisted our ability to recognize tears, scraping patterns, poorly prepared skins, veining and other features related to construction techniques. Further collaborators and research partners included two doctoral fellows, archivists, calligraphers, ink-makers and Irish humanities scholars. The breadth of the collaboration was enriched by the willingness of all to listen, learn, and share ideas from diverse perspectives. The transdisciplinarity of this heritage research enabled creating new knowledge.

Keeping the Wolf from the Door: Remediating the Effects of Pressure-sensitive Tape While Preserving Artistic Intention

Mary French

The American premiere of Peter and the Wolf occurred in March 1938 at Symphony Hall in Boston, with its composer, Sergei Prokofiev, conducting the Boston Symphony Orchestra. Prokofiev conducted from his own handwritten score, which was amended by taping English translations over the original text with pressure-sensitive tape. During the rehearsal process, dynamics and phrasing notes were written into the score with a blue pencil, sometimes directly over the tape carrier. The tape adhesive stained the manuscript as it degraded, and adhesive creep caused pages to stick together. Some tape had degraded to the point of adhesive failure, risking the loss of both tape carrier and handwritten additions to the score.

Usually, the most appropriate solution is to remove both the tape carrier and adhesive where possible to prevent further damage. In this case, however, there were several complicating factors that made treatment less straightforward. The tape was applied intentionally by the composer and showed evidence of his creative process. In addition to preserving the original intentions and aesthetics of the piece, keeping the tape also preserved the composer's notes written onto its surface.

Samples were tested prior to treatment to determine the least disruptive and most stable methods for consolidating media, reducing adhesive, and reattaching the tape carrier. Consolidating the friable blue pencil marks on a slick, transparent surface proved to be difficult. It took multiple tests to find a consolidant that firmly adhered to the tape carrier and didn't dull the surface sheen but could also be easily reversed without removing the friable media underneath.

Tape removal required a flexible approach. Some of the adhesive was heavily deteriorated and had lost all its tack, making it easy to remove. A greater proportion of the tape was only partially degraded and therefore extremely tacky. While a crepe eraser removed excess adhesive from paper easily, the adhesive clung persistently to the tape carrier. To break up the gumminess of the adhesive, dry wheat starch powder was applied in a fine layer.

After the hidden text underneath the taped areas was digitized, the tape carrier and translations were reattached to the paper in their original positions. It was challenging to find an adhesive that readhered the tape carrier to the text while also maintaining its optical properties. After extensive testing with samples, a heat-set application of BEVA® 371 film was selected due to its clarity, ease of application, and reversibility.

Now that treatment and digitization has occurred, the manuscript is stable and much more accessible to its readers. Loose amendments and tape carrier pieces are reattached and the friable blue pencil marks are consolidated. While the damage caused by the tape adhesive can never be reversed, the remaining adhesive has been reduced to protect against future degradation. The previously hidden and never-before-studied text is available for scholars to study via digital surrogate. Despite the unusual challenges presented by this project, conservation honored the future needs of the piece without removing the historic significance of its most damaging aspects.

The Ties That Bind: Communication, Collaboration, and Cross-Disciplinary Professional Development in the Service of Library Special Collections

Aude Gabory, Kimberly Kwan, Elizabeth Ryan

Stanford Libraries (SUL) comprises 20 branch libraries and centers, many with their own special collections materials. Over the past few years, Conservation Services has been actively reaching out to individual branch libraries to expand preservation efforts across SUL. These efforts generated an influx of materials in need of treatment from SUL's East Asia Library. In order to better conserve East Asian bound materials and deepen our relationship with this library, we collaborated with internal staff and external conservation peers within and beyond book conservation to understand curatorial expectations, select appropriate terminology, and develop new techniques allowing us to meet treatment priorities.

Most materials we received from the East Asia Library have been traditional side-stitched books, bound as multiple fascicles enclosed in cloth-covered wrappers. Conservators at SUL found that our existing documentation forms and terminology, designed for European-style books, were inadequate. We addressed this by working with curatorial and cataloging staff to develop new treatment documentation policies. Conservators also shared treatment knowledge with one another to increase confidence and efficiency. This led to further collaboration with international peers on the Book and Paper Group wiki working group for East Asian Bound Formats, enhancing our understanding of East Asian book structures and materials.

Discussions with East Asia Library curators highlighted the importance of retaining and stabilizing the original wrappers for continued use. Standard book conservation techniques were used to stabilize the wrappers, but many items required additional enclosures after treatment as we lacked the textile conservation expertise to repair and restore function to failing textile components. To fill this expertise gap, Conservation Services hosted a textile conservator for a workshop in 2023. The East Asia Library selected items with failing textile components for trial treatment, with the goal of restoring functionality to wrappers and eliminating the need for additional enclosures. Book conservators worked closely with the textile conservator to explore treatment options for these items.

Successful application of textile conservation techniques on trial treatments has resulted in more regular workflows from the East Asia Library. Our growing relationship with them has spurred more discussions with curatorial, technical, and public services staff about preservation best practices for security tags, labeling, and handling. While these individual efforts on different areas of focus might seem minor, together they have strengthened our partnership with a relatively new "client" library and expanded treatment possibilities. We view this collaboration as a model for engaging with other branch libraries and collections, addressing their unique cultural and material needs through thoughtful conservation practices.

A History of the Books in Taiwan: The Transformation of Bookbinding Formats During the Period under Japanese Rule (1895-1945)

Lois Su; Authors: Lois Su, Fei-Wen Tsai

Taiwan is a country located in East Asia, lying on the northwest side of the Pacific Ocean and off the southeastern coast of China. Its geographic position has historically made it a crucial crossroads for trade and cultural exchange among China, Japan, and Southeast Asia. The period of Japanese rule in Taiwan (1895–1945) stands out as an era of profound multicultural interaction and significant transformation. This period was marked by modernization and infrastructural development initiated by the Japanese government. Combined with the flourishing of Taiwanese art and literature in multiple languages, the island's book publishing industry underwent a transformative evolution. This project employs both documentation of binding formats and historical research methodologies to explore the evolution of bookbinding. We have documented various bookbinding formats, including their structures, materials, and conditions, to analyze how they transformed over time and the historical reasons and impacts of these changes.

Before this era, books in Taiwan were predominantly printed and bound outside the island. The Japanese period marked a significant shift, heralding the beginning of local book publishing, printing, and binding industries. By the 1920s, there was a greater emphasis on Japanese language and culture led by the government. Influenced by movements outside the island, Chinese-language books became a means for intellectuals to express self-identity and spread new ideologies. The development of libraries also reflects the transformation. The first library established during the Japanese period was the Taiwan Library (1898). As the demand for books and Taiwan's relation to the world changed, one of the most notable aspects of this period is the transition in binding formats. Over the fifty years of Japanese rule, there was a marked shift from predominantly East Asian side-stitched bindings to a variety of Western European bookbinding styles. It is interesting to observe the shift also in Western styles from a small amount of leather or cloth bindings to mostly modern case bindings. In the later years of this period, it was also common to see a mixture of Western materials with side-stitched bindings. This is one of the first detailed studies on this subject, yet the transformation connects with broader changes in Taiwanese society during this time.

Bookbinding formats reflect the economy and cultural movements of the period, showcasing a piece of history that is often overlooked. To gain a comprehensive understanding of bookbinding practices, the project involves documenting hundreds of books from the period of Japanese rule, collected from the National Taiwan University Library, Tainan National University of the Arts Library, and the National Taiwan Library. We recorded information on binding structures and materials, and are analyzing this data in conjunction with historical records to understand the frequency of different bindings and their relationship to social changes of the time. Additionally, we are compiling condition reports on the books to understand common deterioration, which will provide valuable insights for future conservators and enhance our understanding of bookbinding formats from this important historical period.

Sympathetic to Synthetics: Developing Tear Repairs for Matte Laminated Papers in Twenty-first Century Periodical Covers

Cancy Chu

Plastic-coated papers can be found in the covers of paperbacks, periodicals, and other commercial books of the twenty-first century. These books are potentially collected in libraries and archives containing contemporary print materials, likely becoming more prevalent with time. While synthetic coatings provide added strength and durability to book covers, the waterproof and adhesive-resistant properties of plastic present challenges to the application of conventional treatments for the mending or stabilisation of tears. Adhering synthetic papers with wheat starch paste is likely to be unsuccessful due to the low surface energy of certain plastic coatings.

This project aimed to identify conservation materials and methods for stabilising tears in early twenty-first century periodical journals with matte laminated covers (see Figure 1), a type of synthetic-coated paper that was identified in analysis to contain polyethylene. Analytical examination of the paper was conducted with microscopy, infrared spectroscopy, X-ray fluorescence, Photographic Activity Testing, and pH testing. Next, a range of 9 common conservation adhesives were trialled for adhesion to matte laminated papers with an adapted peel testing method. Successful candidates were artificially aged, tested for reversibility, and compared using visual examination, colourimetry, and gloss measurements. Adhesive candidates were then applied in over 160 blends with varying methods of brushed wet application, pre-coated tissues, and cast films. Results were ranked for adhesion and visual properties to select for the most successful methods.

Results indicate that while repairs with most cellulosic adhesives are likely to fail, a strong and reversible bond can be achieved with certain synthetic polymer-based adhesives (e.g., Aquazol® 500, Lascaux® 303 HV, and ethylene vinyl acetate (EVA)). Performing a successful repair is dependent on blend ratios and application techniques that avoid both weak adhesion and high surface tack, the latter of which could cause blocking. Three techniques using a Japanese tissue carrier and compatible adhesive blends were refined for application, namely: brushing through, brushing on, and reactivating pre-coated tissues with ethanol. A practical workshop for conservators and related roles was conducted to demonstrate and disseminate the techniques.

The presented tear repair techniques are proposed based on test findings on matte laminated papers and may be suitable for use with other papers containing polyethylene. Further research is needed to address additional deterioration pathways of synthetic papers, such as deformation and abrasion. There is a need for conservators to be equipped with adapted techniques for synthetic papers, as these materials can and do form part of present and prospective collections.

This project was supported by the 2022-2023 Fulbright-National Archives Heritage Science Fellowship.

When Outreach Reaches Back: The Treatment and Re-Treatment of Katsukawa Shunshō's Abalone Fishergirl with an Octopus

Amanda Burr

Over the past decade, museums have prioritized outreach, engaging online audiences through blogs and social media platforms with increasing sophistication. Conservators have joined the effort, creating digital content that raises awareness about the field of conservation and carves a window into the day-to-day operations of museum conservation labs. This type of outreach, however educational and entertaining, is generally rather unidirectional, with the information being transmitted from the museum to the audience. It is rare for social media interaction to directly influence the course of a conservation treatment.

In contrast, this talk will present an example where outreach resulted in a conservation treatment being revisited and revised.

In 2018, I treated the Japanese woodblock print Abalone Fishergirl with an Octopus (c. 1773-74) by Katsukawa Shunshō. The treatment was performed in preparation for LACMA's ambitious 2019 exhibition, Every Living Thing: Animals in Japanese Art. The print had suffered significant loss and subsequent restoration in the area of the octopus' mouth. Treatment involved removing an overall lining and disfiguring overpaint that did not correspond to the original design, and filling losses in the primary support. When it came to adding visual compensation to the lost image area, I ran into trouble. There were no other known impressions of the print to which I could refer. I scoured museum catalogs and auction records. My supervisor contacted art historians in Japan. We had no luck. Eventually, deadlines necessitated that I move forward with treatment. In the end, I in-painted the lost image area with an intentional vagueness, adding a fill of background color but no new lines to define form. The result was obviously incomplete but attracted minimal attention, allowing the rest of the print to be properly appreciated.

Soon after treating Abalone Fishergirl with an Octopus, we published an entry on LACMA's Unframed blog explaining the treatment process. The post included an appeal to readers to contact LACMA's Paper Conservation lab with any information about other impressions of the print. It felt like a long shot at the time. Miraculously, four years later in 2022, my supervisor received an email from an art dealer in Venice, Italy who had come across the blog post. He had an intact impression of Abalone Fishergirl in his possession and generously sent a photo, solving the mystery of the missing octopus' mouth in an instant.

This year I finally had the chance to return to Abalone Fishergirl. This talk will describe how I modified the earlier treatment to incorporate the new visual information, including by creating a digital fill (printed onto tengujo and finished by hand with watercolor). It will explore the lightfastness of some accessible printing methods, consider the importance of re-treatability, and celebrate the sharing of information.

Art on Paper Discussion Group

Citrates in Paper Conservation

Moderators: Meredith French, Amy Hughes; Speakers: Crystal Maitland, Sarah Bertalan; Authors: Theresa J. Smith

Conservators have employed numerous techniques and chemicals to remove discoloration and staining from paper objects. While other conservation specialties have utilized ammonium and sodium citrates as stain removers for decades, these are now beginning to see more widespread use in paper conservation. Citrates have shown promise as a tool to remove metallic impurities and staining while preserving the integrity of media and cellulose, however more information is desired. This panel brings together presentations addressing analytical research and theoretical considerations concerning the treatment of works on paper using citrates.

Why do citrates work?

Sarah Bertalan, Conservator of Works on Paper, New York NY

Citrate treatments succeed because they address the unstable inorganic content of modern papers. The additives in papers are well known, however, paper conservators tend not to consider them when discussing condition and treatment. The pigment and mineral additives in modern papers react when exposed to high or fluctuating humidity, daylight and changing pH. These reactions noticeably alter the appearance of works of art. This brief presentation focuses on the use of inorganic additives in modern paper manufacture and their behavior over time.

The effects of ammonium citrate on calcium and iron levels in a 19th century rag ledger paper

Crystal Maitland, Theresa J. Smith, Maeve Moriarty, Ute Henniges and Irene Brückle

Highlighting the inorganic analysis of work recently published in JAIC,* this talk will examine data gathered into the effects of immersion treatments with solutions of ammonium citrate (pH 5.5; pH 8.5) and citric acid (pH 1.8) on the calcium and iron levels and distribution in a 19th century leger paper, both with and without a secondary calcium bicarbonate deacidification step. As ammonium citrates are chelating agents capable of binding both calcium and iron ions we used X-ray diffraction (XRD), scanning electron microscopy/energy dispersive X-ray spectrometry (SEM-EDX), scanning X-ray fluorescence (XRF) and inductively coupled plasma mass spectrometry (ICP-MS) to examine how the distribution of calcium and iron changed with treatment. Despite the brightening effects measured in the paper, in our data we saw very little change in iron levels for any of the treatments tested. The three chelating solutions removed significantly more calcium than the other wash solutions; some calcium was reinstated by the calcium bicarbonate treatment step. There was no statistically significant variation in either the calcium or iron levels achieved by changing the pH of the citric acid or citrate solutions.

* *Venus, Philine, Ute Henniges, Irene Brückle, Crystal Maitland, Theresa J. Smith, Maeve Moriarty, Kamila Bladek, Diogenes Vedoy, and Antje Potthast. 2025. "Testing Ammonium Citrates for Enhanced Washing of Paper."* Journal of the American Institute for Conservation*, March, 1–20. doi:10.1080/01971360.2025.2464337.*

Library and Archives Discussion Group

Managing Existing Mold on Library and Archives Collections

Marieka Kaye, Clara Huisman

The 2024 LACDG session in Salt Lake City focused on acquisitions processes in libraries and archives, from the initial decision to acquire materials to receiving them and integrating them into our collections. One subject that garnered a lot of discussion was mold that comes to us on newly acquired books, papers, and beyond. The overwhelming interest in this topic inspired this year's discussion group theme. We will have three presentations from our colleagues who are actively working to tackle the problem of mold that we bring into our collections.

A Proactive Approach to Managing Mold in Library Acquisitions

Clara Huisman (Book and Paper Conservator, University of Miami Libraries)

This presentation will outline the preventive measures the University of Miami Libraries' Preservation Department is implementing to mitigate mold in incoming collections. These include routine intake reviews, policies for accepting and remediating mold-affected materials, and participation in site visits prior to acquiring materials. The talk will examine the challenges of integrating preservation practices early in the intake process, while balancing the costs and safety requirements of biological risk management amidst the ongoing growth of the library's collections.

How much is enough? Re-examining the mold treatment protocol of works on paper from Harvard Library's Special Collections

Louise Baptiste (Senior Conservation Technician); Lisa Clark (Conservation Technician for Special Collections); Amanda Maloney (Special Collections Conservator); Kelli Piotrowski (Special Collections Conservator); and Eliza Spaulding (Helen H. Glaser Senior Paper Conservator), Weissman Preservation Center, Harvard Library

In 2024, the Weissman Preservation Center, Harvard Library formed a working group to re-examine its mold treatment protocol of works on paper. Although well-defined, the protocol invited inquiry into long-standing questions, including: how much mold removal is enough to create the lowest possibility of regrowth? How can one treat paper with mold to maximize removal and minimize contamination during treatment? What equipment and procedures are necessary for ensuring staff safety? In this presentation and discussion, the authors share their current mold treatment protocol and the questions they've been investigating to think collectively through possible solutions.

Effective Collaboration for Mold Remediation and Policy Development at the University of Michigan Library

Marieka Kaye (Director, Preservation Services, Physical Collections, University of Michigan Library)

Marieka will share the University of Michigan Library's experiences working with disaster recovery company BELFOR for mold remediation. She will highlight the process of sending library materials to be professionally remediated and tactics to keep valuable resources safe and preserved. Marieka will talk about the challenges and opportunities of working in a university where a centralized Environmental Health and Safety (EHS) department establishes rules regarding mold remediation. She will elaborate on the collaborative work between her library and the EHS crew to prepare a comprehensive standard operating procedures guide for working with mold. Marieka hopes to provide guidance for other institutions to balance vendor relationships with institutional policies, permitting a proactive and coordinated response for mold remediation and prevention.

Adhesive Kinetics: the Folding Endurance of Wheat Starch Paste, Cellulose Ethers, and Photo-Grade Gelatin

Catherine E. Stephens

Books are kinetic objects that perform finely-engineered movements to reveal their contents. If a book's structure is broken or compromised, its information cannot be experienced in the manner that its creator intended. Loss of mechanical function is particularly disruptive for manuscripts, artist's books, photograph albums, and scrapbooks, in which unique, intimate narratives may be presented. In some ways, nineteenth century photograph albums present worst-case treatment scenarios to conservators; these albums tend to be both heavy and very fragile, due to inherent vice, yet these albums may be frequently requested by researchers. Furthermore, photographs are physically and chemically sensitive, and nineteenth century papers are often quite water sensitive, which limits treatment options. As heavy leaves and delicate hinges embrittle with age, a nineteenth century album may pull itself apart, posing many questions; is it possible to restore mechanical function to this album without frequent re-interventions? Which materials are best for reinforcing the connections between heavy leaves and delicate hinges? Do adhesive mixtures, such as 75% wheat starch paste and 25% methylcellulose, provide better flexibility when dry?

The above questions inspired this study, in which the author, a book conservator, collaborated with paper conservators, photograph conservators, and conservation scientists at the Metropolitan Museum of Art. This presentation will discuss the methodology and results of the study, in which the relative folding endurances of Jin Shofu wheat starch paste, photo-grade gelatin, and six cellulose ethers were evaluated, before and after artificial aging. Additionally, 3:1 mixtures of wheat starch paste, methylcellulose, and/or photo-grade gelatin were studied, to observe the mechanical performances of these mixtures, once dry. To inform the methodology of this study, a self selecting survey of seventy-five AIC Book and Paper Group members was conducted. Survey participants were asked to indicate their adhesive preferences for certain treatment scenarios, and whether they are in the habit of combining two or more adhesives to alter their wet and/or dry properties. In this study, all adhesives were prepared at concentrations that would normally be used by book, paper, and photograph conservators, or at viscosities that would allow a conservator to reline the spine of a book or repair its hinges. Strips of naturally aged chromatography paper (pure cotton linters, manufactured in 1959) were impregnated with these adhesives and were evaluated with a Tinius Olsen folding endurance machine. Although folding endurance machines do not perfectly replicate a book's normal range of motion, these machines offer insight into the effects that adhesives and sizing agents may have on the mechanical strength of a standard paper.

The surprising results of this study indicate that wheat starch paste has a much lower folding endurance than cellulose ethers with comparable bonding strengths, and that mixing two adhesives together significantly impacts the folding endurance of a standard paper, both before and after artificial aging. The author hopes that the results of this study may assist book, paper, and photograph conservators when selecting resizing agents and when repairing the flexible components of books and moveable paper objects.

Evaluating the effectiveness of alum-tawed parchment as a repair material

Gwen dePolo, Kathryn Kenney

The selection of appropriate repair materials is a primary factor in the long-term success of interventive treatment. This is particularly challenging for parchment repairs in which we must find a material that is comparable in rigidity, color, and weight as well as compatible with the hygroscopic nature of the original parchment. When parchment repairs are needed in bound materials, these repairs must also be able to withstand repeated flexing from use. Following a 2019 cross disciplinary workshop hosted by the Folger Shakespeare Library, "Biocodicology: The Parchment Record and the Biology of the Book", conservators at the Folger became interested in recreating an historic preparation of tawed parchment for use as a repair material. It was immediately apparent that this project would require extensive collaboration. The outline for the project included processing the skins, making sample repairs, and carrying out a suite of analytical and ageing tests.

As a small independent research library, the Folger does not have the analytical capabilities necessary to evaluate the skins, nor do we have a scientist to help guide testing and interpret results, so we began reaching out to other institutions for assistance. The Folger collaborated with Jesse Mayer at Pergamena to prepare twelve skins of varying thicknesses using an historic recipe. Once the skins were prepared, conservators at the Folger worked with William Minter and the Penn State University Libraries to begin accelerated ageing tests on samples from the skins. The Preservation Research and Testing Division (PRTD) at the Library of Congress has an extensive array of analytical equipment and a staff of highly trained conservation scientists. In the spring of 2024 conservators at the Folger began working with Dr. Gwen dePolo at PRTD to analyze the tawed skins. With the specific use case of the repair material in mind, the analytical testing has focused on the mechanical properties, physical properties, thermal stability, and investigating the source of a residue exuding from the skins. Dr. dePolo and Kathryn Kenney have had regular meetings about the skins, types of tests to perform, and how the results impact the usability of the alum tawed parchment as a repair material. The collaboration between the Folger Library and PRTD has proved mutually beneficial as the methods applied to analyzing the alum-tawed skins will also be used in other parchment-related research projects that will be pursued at the Library of Congress.

This talk will discuss the benefits and challenges of a large collaborative project. We will discuss how we defined the scope and scale at an institutional level and have been able to draw on the strengths and expertise of all the participants at an individual level. Specifically, we will focus on how we used our different, but complimentary knowledge to evaluate a potential new repair material considering usability and long-term stability.

Reconsidering Klucel M: A Comparative Study of Commonly Used Cellulose Ethers in Paper Conservation

Grace Walters; Authors: Christopher Bolser, Andrew Davis, Gwenanne Edwards, Kelli Stoneburner, Grace Walters

This study investigates characteristics of three cellulose ethers in the search for a stronger solvent based adhesive to add to the options available to paper conservators. Cellulose ethers are available in various polymer chain lengths (corresponding to strength), can be water and/or solvent soluble, and often have desirable aging properties. Two of the most widely used cellulose ethers in paper conservation are methylcellulose (Methocel) and hydroxypropyl cellulose (Klucel). This research compares commonly used Methocel A4M (water soluble, long polymer chain) and Klucel G (water/solvent soluble, short polymer chain), with overlooked Klucel M (water/solvent soluble, long polymer chain). Klucel M has the potential to be a crucial tool in the toolbox of paper conservators, as it has a similar polymer chain length and adhesive strength to Methocel A4M, but has the advantage of being soluble in solvent, like the much shorter length and weaker adhesive Klucel G. While older research indicated that Klucel M is inappropriate for long term use with collections, more recent research has indicated that it could be an acceptable option. Using analytical techniques including accelerated aging, colorimetry and UV-vis-NIR spectroscopy, size-exclusion

chromatography, Oddy testing, and PAT testing, this study compares the adhesives Methocel A4M, Klucel G, and Klucel M and offers case studies for the use of Klucel M.

Book and Paper | Photographic Materials | RATS | Imaging

Investigating Transmitted Infrared Imaging to Detect Chalk Media on the Verso of Lined Stradanus Drawings

E. Keats Webb; Authors: Perry Choe, E. Keats Webb

The Cooper Hewitt, Smithsonian Design Museum has a collection of approximately 300 sketches by Jan van der Straet (called Stradanus) a 16th century court artist to the Medici in Italy. A group of these drawings may have important information on the verso written with black chalk, but unfortunately, have been lined with paper. The presence of inscriptions/drawings on the verso has been detected using transmitted visible light when the media is ink but not for chalk. To minimize carrying out interventive conservation treatment to remove the linings from the fragile drawings, transmitted IR imaging was investigated to determine whether the technique could be used to detect chalk drawings on the verso without removing the linings from the drawings.

This initial imaging investigation involved four Stradanus drawings. Reflected and transmitted visible light and IR images were acquired of the recto and verso of the drawings. The investigation started with the three drawings that had the paper linings removed and had known verso chalk drawings. The first step involved testing whether transmitted IR imaging of the recto could resolve the verso chalk drawing which could be verified with reflectance images of the verso. Preliminary processing, during the image acquisition, indicated that transmitted IR and image processing could detect the verso drawing, so the next step involved imaging one of the unlined drawings with a paper support placed behind the object to mimic the lining. The final step involved the imaging of a fourth drawing that had not had the paper lining removed and it was unknown whether there was a verso chalk drawing.

Transmitted IR images on their own did not provide much information, but image processing, both false color and image subtraction, was essential for further analysis. The false color image processing involved combinations of reflected and transmitted visible light and IR images including newer techniques that have only been introduced and used on paintings. The image subtraction processing was the difference between the reflected and transmitted IR images. The most promising methods were the image subtraction and the false color processing using transmitted visible and IR images. The image subtraction was able to fully resolve the verso chalk drawing for one of the drawings (both with and without a tertiary support), but the same processing was less conclusive for a verso chalk drawing that did not have identifiable features. When the difference mode was less conclusive, some of the false color processing seemed to be able to reveal some features that do not correspond with the recto ink drawing and could suggest that there might be verso chalk drawings.

The imaging of four Stradanus sketches suggests that transmitted IR imaging and additional processing is promising for detecting verso chalk drawings without removing the paper lining, but the results were not always definitive. Additional testing with a larger subset of drawings is needed to further investigate the potential of transmitted IR imaging and image processing.

Colorant Detectives: An Interactive Dichotomous Key for Multiband Imaging

L. M. Ramsey

The Colorant Field Guide is an online, interactive tool designed to aid in the visual interpretation of colorants on paper based on their responses to visible (VIS 380-650nm), ultraviolet induced fluorescence (UVF 420-650nm), ultraviolet reflected (UVR 320-400nm), and reflected infrared radiation (IR 780-1100nm [850 peak]). By employing standardized vocabularies and metrics like CIELAB and Munsell color systems, the guide ensures rigorous, reproducible, and communicable results.

Rather than relying on static research papers, black-box algorithms or automated false color post-processing systems to locate and provide results, users must navigate through a decision tree that exposes them to the various factors that influence sample behavior, including light absorption, fluorescence, and reflectance. This process demystifies colorant response by breaking it down into manageable steps, helping users to build a strong foundation of knowledge that can be applied in real-world conservation scenarios.

Transparency in documenting light/radiation sources, filters, and post-processing techniques is emphasized to achieve consistency and comparability across institutions. This approach fosters collaboration and enhances the collective knowledge base in conservation while addressing the inherent uncertainties in multispectral imaging and dichotomous identification methods.

Building a dynamic dichotomous key involves both a logical framework and technical implementation to ensure usability and functionality. I designed it to be simple and effective using basic HTML, CSS and JavaScript languages to make the key interactive, process user input, and display results dynamically. To translate the flow chart to an interactive framework, it was important to list each colorant and their responses in a standardized order. This order helps build a logical, hierarchical flow. At each decision point, users are guided either to the next question or to a result, allowing for the possibility of future expansion.

In addition to the key, I am developing a pictorial atlas of colorants recorded under these imaging techniques to serve as a visual reference. This project is intended to be publicly accessible and expandable, allowing users to submit data that meets established criteria. These submissions will be clearly credited, promoting transparency and collaboration. By encouraging contributions, this tool fosters a cooperative research environment, enriching the field of cultural heritage preservation and providing a shared resource for the broader academic community.

Dichotomous keys have long been valued in education, particularly for teaching critical thinking, systematic problem-solving, and observation skills. As multiband imaging becomes a standard practice in more institutions, this accessible tool will help ensure visual literacy in the conservation field remains strong.

Automating Image Registration with OpenCV-Python: Lowering the Cost Barrier for Multiband and Multispectral Imaging Setups

Jiuan Jiuan Chen, Grace Wilkins

Both multiband and multispectral imaging can provide a wealth of information about material characteristics and condition—with insights derived from qualitative and quantitative comparisons of images captured at different wavelengths and with different excitation sources. Workflows for these types of imaging often require costly additions to existing setups: IR-modified and/or monochrome cameras, filter sets, apochromatic lenses, and even licenses for proprietary image processing software, the sum of which can present a significant cost barrier. Certain equipment is essential, such as modified UV-VIS-IR full spectrum color or monochrome cameras. However, it is possible to perform multiband and multispectral imaging without the added cost of an apochromatic lens—one which produces a single focal plane across all wavelengths. The main challenge, however, with using a regular (achromatic) lens is the need to re-focus for each filter band, leading to registration issues across the entire set of images captured. This misalignment must be corrected post-capture not only to remove visual inconsistencies in false-color images but also to carry out any further computational analysis, such as Principal Component Analysis or Spectral Angle Mapping.

With this issue in mind, this project has focused on developing a low-cost, open-source method for automating the registration of image sets generated from multiband and multispectral imaging workflows. Drawing on research beyond the field of art conservation, we have adapted Python code from a recent publication on vision-based robotics grasping in order to identify the specific feature-based pixel coordinates necessary for image registration. Specifically,

the code utilizes an Open Source Computer Vision Library (OpenCV) tool called template matching as an alternative to feature-point detection algorithms or more complex object-detection models. In total, this method requires the addition of only a few printed paper targets and is designed to be integrated easily into existing multiband and multispectral imaging workflows. The current iteration of our adapted Python code can be executed directly from a computer's command line, and we are hoping to create an ImageJ/FIJI plugin to make the script more readily available and user-friendly.

Using multispectral imaging to augment digitized West African manuscripts

Stephanie Gowler

Northwestern University Libraries (NUL) is home to over 3,000 Arabic script materials from West Africa. Part of the Herskovits Library of African Studies, these manuscripts come primarily from northern Nigeria and cover subjects including history, theology and astronomy. Most are Arabic, but some are Ajami – non-Arabic languages written in Arabic script. The size, scope and uniqueness of these underrepresented collections, along with increasing global scholarly interest, make them a priority for conservation and digitization. In collaboration with curatorial, cataloging, and digitization staff, the NUL Preservation Department has established standardized protocols to survey, house, treat, and – using a VSC®80 forensic questioned document examination workstation – capture a range of multispectral images (MSI) that are integrated into the digital repository, adding a degree of materiality to the imaged West African manuscripts.

Paden 417 (مختصر في فروع المالكية), a copy of the "Mukhtasar" of Khalil b. Ishaq b. Musa al-Jundi, a fourteenth-century handbook of Maliki legal principles, is one of the oldest, largest and most complex manuscripts we have worked on and serves as a case study. It is comprised of 230 individual leaves of handmade paper contained in a later leather wrapper. The primary text is written in neatly ruled lines using brown and red inks, with commentaries and annotations filling virtually all other areas of the paper in brown and black inks. The paper is brittle and discolored, with extensive losses along the edges. In preparation for imaging, the manuscript received over 300 hours of treatment from ten different current and former staff members. Our collaborative approach is not unique to this object, but it was critical for addressing the challenges presented by Paden 417, which would have been daunting and laborious for a solo conservator.

Many of the Arabic manuscripts lack colophons or other means cataloguers use to establish clear provenance, so to understand their history and production, we must rely on the physical objects. NUL purchased a VSC®80, which allows us to quickly and consistently capture and annotate a wide range of MSI of watermarks, inks, ruling lines, and other materiality of the manuscripts.

As one exciting example of how MSI may be used, portions of Paden 417, along with a selection of MSI files, were recently examined by scholars at the Centre for the Study of Manuscript Cultures in Hamburg, Germany. Although they had actual manuscript pages, the enhanced images of the watermarks allowed them to date the manuscript to the mid-16th century, making this one of the earliest written examples of Hausa Ajami.

As of this writing, Paden 417 has been treated, housed, and VSC®80 images of select pages have been captured. Digitization is underway and collation of this fragile object will follow. We anticipate that the manuscript and associated MSI will be publicly available in the digital repository by early 2025. Incorporating MSI into our digital repository augments the standard digital images, opens the door to scholarship worldwide and presents future opportunities for collaboration on machine learning and generative AI initiatives.

Contemporary Art

Direct Approaches to Complex Situations: Collaborating to Display Contemporary Textiles at the Los Angeles County Museum of Art

Kristal Hale

Working with contemporary, mixed-media textiles presents unique display challenges. Artworks are frequently created from a wide range of materials and can be extremely heavy, voluminous, and sometimes, self-destructive. Meanwhile, an artist's vision of how their work is perceived by the world may not entirely align with the stability of the piece itself.

Artworks at the Los Angeles County Museum of Art include such pieces as Aunty Lovey se Kombuis, 2022 by Igshaan Adams. Created from wood, plastic, glass, bone and shell beads, fabric, cotton twine, silver linked chain, and plastic-coated wire, this massive piece was originally nailed to a wall by the artist at approximately one foot intervals, causing the piece to inherently distort along its upper border. Although the distortion was intentional, the stress along these points posed long-term risks to the plethora of materials used. This was taken into consideration during preparatory and installation phases as a variety of mounting approaches were tested - with the goal of reducing stress and strain, while preserving the artist's vision.

Working directly with an artist during an installation can also require swift adaptability. During the installation of We Live in Painting: The Nature of Color in Mesoamerican Art, Porfirio Gutierrez a Latin American artist and activist added yarn sculptures and nopales, prickly pear cactus segments (phylloclades) to his installation list. Before entering the galleries, cactus spines and any cochineal insects were first removed from the phylloclades, which were then strung on hemp and suspended from a prepared rack. Since the artist mentioned that metal accelerated degradation of the cactus segments causing them to rot, the hanging mechanism was inserted with sharpened pencils.

Installing contemporary textiles often requires collaboration between conservators, collections management teams, preparators, and often, the artists themselves, resulting in exhibitions that aim to achieve the artist's vision, while preserving the material integrity of the artworks and maintaining gallery spaces.

Mud Musings: Changing Systems and Ideas in Robert Rauschenberg's Sound-Activated Artworks

My Bundgaard, Caroline Carlsmith; Authors: My Bundgaard, Caroline Carlsmith, Tora Hederus

Robert Rauschenberg's Mud Muse (1969-1971) consists of a large rectangular vat filled with a mixture of water and bentonite clay. Within the vat, the mud bubbles in response to the recorded sound of its own bubbling through an audio-activated compressed-air system. Mud Muse was donated to the Moderna Museet in 1973 and remains one of the museum's key works. Yet despite its popularity its mechanism is often misunderstood, veiled in rumor and mythology with self-fulfilling repetition, some of which originated with the artist himself.

Rauschenberg began experimenting with interactive sound artworks in the 1960s, often in collaboration with engineer Billy Klüver, in what would become known as Experiments in Art and Technology (E.A.T.). Rauschenberg continued this exploration in Mud Muse together with engineers from Teledyne and sound artist Petrie Mason Robie through the Art & Technology program at the Los Angeles County Museum of Art.

Mud Muse's initial production was characterized by a series of compromises and adjustments, both conceptual and mechanical, to create a sculpture that functioned (roughly) as Rauschenberg intended. Both the art historical record and material evidence point to its having been reconsidered and reconfigured almost continuously up until – and likely beyond – its public debut. As its own prototype, the sculpture shows evidence of several changing approaches during its creation, along with that of later repair campaigns. Fully parsing these changes, as well as the reasoning behind them, was crucial to understanding the work's "ideal" state, and therefore to determining what interventions are

appropriate to conserve and install the work as the most accurate manifestation of Rauschenberg's idea.

For decades, Mud Muse was exclusively installed by Moderna Museet electricians and very little written documentation was created. When the latest electrician retired in 2018, no permanent museum staff-member had a complete understanding of how to install and operate the piece. To steward the work responsibly, it was crucial for the museum to re-establish this institutional knowledge.

In 2019, Tora Hederus and My Bundgaard initiated research at Moderna Museet into the construction and history of Mud Muse, hoping to better understand the functions of the technical components and their importance in relation to Rauschenberg's ideas. Their research in the archives at both the Moderna Museet and the Robert Rauschenberg Foundation focused particularly on the creation of the sound tape, the choice of tape recorder, amplifiers, and frequency dividers. In 2024, NYU graduate student Caroline Carlsmith joined the research team, bringing previous experience working with Rauschenberg's first sound-activated E.A.T. artwork Soundings (1968) at the Museum Ludwig in Cologne. Working together, these conservators from different backgrounds were able to better identify systems that had been attempted and abandoned as well as later changes made as components failed over time. Their collaborative investigations suggested that the conflicting stories in literature about the work were not all accurate. A more comprehensive technical art history based on close study of the electrical and pneumatic systems enabled the most optimal installation and was necessary to understand what Mud Muse had been and how it had come to be.

Building collaborative networks of care for the conservation of Chryssa's neon works

Joy Bloser

From static light sculptures to found material constructions, Greek-American artist Chryssa (1933-2013) wove neon tubing throughout her sculptural practice. Her ingenuity and craft produced a collection of ambitious and unique sculptures, teeming with experimentation in glass bending, neon color theory, scale, and display technology that integrated mechanical components and aging neon sign hardware with new advances in plastics into sculptural form. Inspired by the neon signs of New York, she transformed this high-voltage signmakers' craft into an unprecedented body of sculpture and light art.

A traveling exhibition of Chryssa's works in 2023-24 necessitated a large campaign to restore her neon sculptures from the 1960s, the process of which posed a series of conservation challenges surrounding obsolescent technology, hard-to-find technical expertise, and strategies for how to care for sculpturally- and mechanically-complex light art. As the coordinating conservator for the three-venue exhibition, I was in a unique position of both participating in decision-making related to the exhibition organization and serving as a liaison to conservators and neon benders engaged by our lenders to help restore her work.

In the case of Chryssa's neons, the challenge of restoration was magnified by the lack of research on the artist, and her general exclusion from the art historical record prevented most institutions and collectors from acquiring more than a token few of her works. The general unfamiliarity with Chryssa, compounded with her not having a recognized estate or foundation acting on her behalf, left much of her work in disrepair in storage. In order to successfully bring her works together in a cohesive, operational, and unified manner, I found that I needed to build a collaborative network of care between art conservators, neon benders, registrars, and art prep teams.

Successful strategies in building this network of care included connecting conservators treating similar condition issues for different lenders, sharing resources broadly across the team related to materials and construction, hosting a group call for conservators treating her work and neon benders to discuss condition issues and options, hosting a public panel discussion on the conservation of Chryssa's neon, and organizing an in-person Study Day at the second exhibition venue to share research, technical skill, and reflect on the conservation treatments we carried out. Together we were able to develop collective preservation strategies that will hopefully help inform the better understanding and future conservation of Chryssa's work.

In name only? Collecting and caring for non-delegated performance artworks

Brian Castriota

Artworks involving live performance are now a small but not uncommon feature of contemporary museum collections. Much ink has been spilled over the last two decades around how best to keep the liveness of these works accessible for future generations. The enactment of most, if not all, live performance artworks in museum collections is achieved through delegation, whereby (re-) performances are made possible by individuals following written specifications and/or through practices of body-to-body knowledge transmission between performers. Artworks whose live performance cannot be delegated to others (e.g. those that can only be performed by their creators) have instead largely entered collections in the form of their archival traces or "supplements" that serve to stand in for the performance in a display context: photographic and audiovisual documentation; props, leftovers, or relics presented as artefacts; or a combination thereof, at times becoming installations. Using the Irish Museum of Modern Art's recent acquisition of several performance artworks by Northern Irish artist Sandra Johnston as a case study, this talk critically examines what it means to both collect and care for a category of art that has been excluded from museum collections and consideration by conservation discourses: that of non-delegated live performance.

The live enactment of Johnston's performance artworks cannot be delegated to others. Her performance practice is deeply personal and improvisational, a method of haptic, object- and site-responsive inquiry she often carries out in "contested spaces," confronting traumatic memory retained in objects and sites. While some of her works have been (re)materialised for exhibition purposes in displays of audiovisual documentation of her past performances, IMMA's acquisition is notable in that these works were not subjected to the "rewriting" (Hölling 2017) that often comes with the acquisition of complex contemporary artworks and tends to transfigure them into "durable and repeatable" (Laurenson & van Saaze 2014) collection objects. Several of the works that IMMA acquired were sparsely documented and were acquired without any expectation or agreement, written or verbal, that Johnston would perform them again. The potential for their live (re-)performance instead depends entirely on Johnston's future ability and willingness to do so. Some of these performances are so site- and context-specific it is uncertain if their (re-)performance is even possible.

Eschewing an anti-institutional critique that there is no place for these works in museum collections (beyond in the form of their documentary traces), this talk considers the value and importance of institutional collecting of non-delegated performance artworks. It examines how "external dependency" can and should be released from its negative framing, and reimagines the role of the conservator in caring for artworks whose "means of production" (Lawson et. al 2023) cannot be acquired by the museum. Significantly, this talk considers how a methodology of attunement—in this case, responsive to the logics, principles, and specificities of Johnston's artistic practice—revealed how an institutional care for these works depends not only on what conservators and collection staff do but also on what we stop ourselves from habitually and mindlessly forcing or repeating.

A Prophylactic Treatment: Two Condom Collage Replications in Joanne Leonard's Journal of a Miscarriage (1973)

Clara Rojas Sebesta; Authors: Margo Delidow, Clara Rojas Sebesta

In 2021, the Whitney Museum of American Art acquired Joanne Leonard's Journal of a Miscarriage (1973), a series of collages documenting the artist's personal experience of pregnancy loss. Joanne Leonard is an American artist and scholar who uses photography and collage to explore feminist issues and visual culture through what she describes as "intimate documentary." She taught at the University of Michigan for 31 years and is among the few photographers - and even fewer women artists - to have been included in Janson's History of Art (1986) and Gardner's *Art Through the Ages* (1990).

Journal of a Miscarriage, one of Leonard's early photocollage works, was

created in 1973 as the Roe v. Wade case and women's reproductive healthcare were dominating public discourse. According to the artist, the Journal is "not just the story of the miscarriage but the feelings afterwards of sexuality and anger, desire, and a desire for pregnancy."

When the series of 29 collages entered the collection, two works--*Death, 1973* and *Condom with Stamps, 1973*--incorporated 1970s latex condoms which had deteriorated significantly. *Death, 1973*, was deemed unexhibitable as the embrittled condom was fragmented and darkened to a blood red-brown and had discolored the adjacent collage materials. *Condom with Stamps, 1973* is no longer extant and was included by the artist with an inkjet print surrogate. The inkjet print differed in size and materiality from the other 28 works in the series, presenting more of a facsimile of the work than exhibition copy.

The presentation will outline the collaborative decision-making process around these two collages by paper conservator Clara Rojas-Sebesta and objects conservator Margo Delidow, in close discussion with the artist, who provided original collage materials from her archives in addition to contextual guidance. The treatment of the original and the replica fabrication led to an exploration of 21st century condom technologies, an intimate encounter with lubricants and a confrontation with the inherent vice of degraded latex, which dovetailed with Delidow's research on Lynda Benglis' latex with the Detroit Institute of Art, presented at the 2024 AIC annual meeting.

Leonard sourced much of her photographic collage materials from the seminal 1965 book, *A Child Is Born*, by Swedish photojournalist Lennart Nilsson, as well as *The Boy's King Arthur*, (1917) illustrated by N.C. Wyeth. The presentation will also touch upon the meaning in these materials and the exhibition history of this work as it reflects attitudes towards miscarriage and women's reproductive healthcare. Through the refabrication of these collages and documentation of artist's intent, the project results in a recovery of meaning in Joanne Leonard's poignant *Journal of a Miscarriage*.

On the intersection of art and human rights: Collective efforts to preserve the work of imprisoned artist Luis Manuel Otero Alcantara

Salomé García Bacallao, Anamely Ramos Gonzalez

During World War II and the times of political and ethnic persecution preceding it, a part of the art world came together to protect artists at risk and rescue their work, as well as that of old masters, from burning on pyres or being trafficked by military regimes. Despite these coordinated efforts by democratic forces, many lives and heritage were lost. The recovery of lost or trafficked art remains at the center of the mission of many cultural institutions to this day. In 2024, as seventy percent of the world population lives under autocracies, and democracies erode worldwide every year, with censorship, systematic persecution and forced displacement of hundreds of thousands of people worldwide as a consequence, the question arises: Should preservation professionals play an active role advocating for the protection, not only of the artworks, but of the endangered artists' integrity as well?

With this proposition in mind, we will present our experiences collaborating with Luis Manuel Otero Alcantara, an artist imprisoned in Cuba since 2021 for his political activism, in documenting his creative processes, evacuating some of his artworks, and advocating for his release, as part of collective efforts from his close friends, supporters in the art world, and the international community.

Otero Alcantara, born in Havana in 1987, is a Cuban self-taught artist and political activist, better known for his performances and hunger strikes in defiance of the country's Communist regime authorities. In 2018, he co founded the San Isidro Movement, to protest the imminent enactment of repressive cultural policies under Decree 349. From that moment, he was systematically persecuted by the state forces and regularly detained, until he was finally arrested in July 2021 after his attempt to participate in the unprecedentedly massive anti regime protests that took place across the country. Earlier that year, in April, the political police had broken into his studio and destroyed a group of artworks he was producing with the involvement of the San Isidro community, before sequestering him for several weeks in a hospital.

Anamely Ramos, who was a member of the San Isidro Movement, has been interviewing Luis Manuel Otero Alcantara throughout the last five years, delving on his motives and techniques, his use of diverse media, from sculptures and drawings to performances, and his constant efforts to activate and involve communities in his work. She has also been documenting his production while in prison.

Salome Garcia had the opportunity to interview the artist days before he was imprisoned, regarding his recently destroyed series of paintings Caramelos sin saliva, with the intention to document the process of their conception and how the artist envisioned possible ways to rescue these artworks.

Although most of these conversations have been published in different media, this is the first time they will be presented together with a focus on conservation.

Contemporary Art + VoCA

The conversation in a language of love. Passion or murder? An interactive presentation between Chilean artist Daniela Rivera and Spanish conservator Ruth del Fresno-Guillem

Ruth Del Fresno-Guillem, Daniela Rivera

We highlight the need to create bridges and trust when discussing interviews and long-term relationships with artists. Trust is the base of most of the deep relations we make in our lives and in a professional capacity. Interviews, when conducted from a trusted perspective, are "a place of shared vulnerability" (Daniela Rivera, 2024). Still, this vulnerability becomes complicated or different when we add language to the equation of trust and vulnerability.

When conducting the research and the pre-interview contact with the Cuban artist Gladys Triana for the CALL/VoCA series back in 2019, I noticed how different it was to talk and interact with Gladys when we were speaking Spanish versus when speaking English. Spanish was our commonplace language, but we also agreed it was the language of love and rage. Emotions were better expressed in our mother tongue. Even though we speak different Spanish versions, the connection was more natural, and her memories came from a feelings perspective.

Curator Leah Triplett Harrington interviewed artist Daniela Rivera for the VoCA Talk series during the pandemic. Her experience with all the uncertainties and the imposed distance made her reflect on many aspects of the interview from the artist's point of view. While presenting this experience in one of the Spanish VoCA workshops, the issue related to the language arose, and it captured the interest of both the artist and the conservator to dive into the experiences and conduct a new interview in Spanish.

In this presentation, Chilean artist Daniela Rivera and Spanish conservator Ruth del Fresno-Guillem want to expose the shared vulnerabilities that have been lost in translation. We want to expose the experience, the results and the research conducted from the perspective of a language of love and a language of work. The difference between using language to communicate concepts and the use of language to communicate emotions and how to reach the desired outcome of integrating them. Ultimately, the interview as an act of love and kindness in a double direction. Language as a possible enhanced channel of connections or a political contradiction. As a Spanish-born professional, working with Latin American artists can be a position of connection by language and some cultural aspects. Still, it can also be a separation by historical colonialism and misunderstandings. We want to explore the language and cultural limitations and possibilities and question our biases and strengths.

This presentation wants to be a reflection/experience-based to enhance the reflection about how we conduct and receive an interview.

Planting the Seed: Collaboration in the Preservation of Kraus Campo

Gwynne Ryan; Authors: Sylvia Jeffriess, Gwynne Ryan

In 2004, construction was completed on Kraus Campo, a large-scale outdoor

art installation functioning as a green roof and sculpture garden on the campus of Carnegie Mellon University in Pittsburgh Pennsylvania. Consisting of over 2,000 individual plants and over 1,000 feet of painted concrete pathways that converge upon a 25" x 60" x 3" tiled interactive sculpture in the form of a large French Curve, the garden is a collaborative work by the artist Mel Bochner and Landscape Architect Michael Van Valkenburgh. Conceived as a single integrated work combining art and landscape design, the diverse materials and components of the living artwork has required the care and input from a wide variety of specialists and contractors to maintain it over the past 20 years.

A critical moment was encountered in 2023 when one of the primary plants of the artwork was classified as an invasive species in Pennsylvania. The conversations that ensued triggered an in-depth revisiting of the meaning and importance of the work as a whole, and resulted in the development of a comprehensive Conservation Management Plan that would look beyond the seasonal, routine maintenance requirements to the long-term considerations of an artwork that literally grows and evolves over time. To create this document, the Preservation team at UAP (Urban Art Projects) collaborated with the artists, collecting institution, donor and the individuals on the CMU facilities maintenance team by conducting interviews, reviewing archives, and capturing the stories from those who were present throughout the artwork's creation and life up to the present. The process raised critical questions about differing perspectives, transference of knowledge, and resulted in a proposal for a full reset and replanting of the garden. This project explores the importance of collaboration in revising, reviewing, and updating living artworks while considering the priorities and resources of those charged with its care.

Developing a Designer Residency Program From the Ground Up

Sarah Barack, Jessica Walthew

The Evolution of Glenstone Museum's Artist Oral History Program

Steven O'Banion; Authors: Steven O'Banion, Samantha Owens

When Glenstone opened to the public in 2006, it was a small private foundation in Potomac, Maryland. The process of interviewing artists began organically, as significant site-specific outdoor sculptures were being installed across the landscape. Glenstone's founders had the forethought hire a film crew to document the installation process, which led to filming the artists when they visited for the installation. This in turn triggered the founders to pull the artists aside to speak to them in a more focused way about their work. The practice developed into a desire to approach interviews systematically, recording formal conversations with as many of the artists whose works are represented in the collection as possible. In 2009, a curatorial staff position was created with the intention of expanding the oral history program to include not just artists, but also those who could lend special insights into their work, such as collectors, estate directors, installers, family members, curators, etc. Glenstone established an in-house conservation department in 2014, which resulted in collaborative discussions merging curatorial and preservation perspectives to document a more holistic view of what it means to care for and exhibit works the way their creators intended. As Glenstone has matured from a small foundation to an expansive museum, much of the audio and video production has moved in-house and the pool of collections staff able to conduct interviews has grown and diversified. A curriculum is now being developed to train staff on oral history best practices. This has allowed for thoughtful pairing of interviewers and narrators and resulted in conversations that vary in formality. It is hoped that tailoring of the interview experience to each participant will foster meaningful dialogues and help build enduring relationships that are an essential component of being responsible stewards of an artist's legacy.

Bringing in new voices: the next generation of the Artist Documentation Program

Corina Rogge, Matthew Skopek; Authors: Joy Bloser, Jeremy Davet, Sara Kornhauser, Corina Rogge, Matthew Skopek, Farris Wabeh

Talking to artists - learning about their materials, practices, and desires for how their artwork should live, age, and be treated- was, thirty years ago, a novel concept. In 1990, faced with the unique challenges presented by the care of contemporary art, Carol Mancusi-Ungaro, then the Chief Conservator at the Menil Collection, initiated what evolved into the Artists Documentation Program (ADP). The program grew with time, developing into a partnership with the Whitney Museum of American Art after Mancusi-Ungaro relocated there in 2001, at which point Brad Epley was appointed Chief Conservator at the Menil. Until their departures in 2023, the program continued under their co-direction. At this juncture Matthew Skopek, the Melva Bucksbaum Director of Conservation at the Whitney Museum of American Art and Dr. Corina Rogge, Director of Conservation at the Menil Collection assumed co-directorship.

This transition offered an opportunity to reevaluate the program, redefine its mission and values, and outline a three-year strategic plan. Rather than siloing the decision-making at the director level, this process, conducted over a 2-day retreat, was opened to archivists and conservators working at the Menil and Whitney to leverage their broad expertise.

To figure out where ADP was going, the group first had to evaluate the past, assessing how the program evolved from its inception and looking critically at why some interviews were more successful than others and how that could inform practices moving forward. The group then collaboratively developed mission and vision statements and outlined a core set of values that can be used to inform the project's future. The mission and vision statements confirm Mancusi-Ungaro's foundational precepts that the purpose of the interviews is to document, at that particular point in time, the subject's memories and thoughts about their artwork, and that the interviews should be minimally edited to ensure the integrity of the interview, respect the artist's voice, and best facilitate seeing and hearing the artist in the presence of their work. With these guiding principles the group then determined strategic goals, each of which were designated as short-, middle- and long-term action items.

As one of the longest running artist interview programs, this reevaluation may strike some as heretical, but just as artistic practices change, so must interview practices. Especially important to all participants were the issues of accessibility and diversity, and we are currently engaged in exploring how to most effectively provide English and Spanish closed-captioning and transcripts. The value of this effort was made evident by Irene Esteves-Amador's 2021 interview with Daniel Lind-Ramos in Spanish, which was the first ADP interview conducted in a language other than English.

A periodic re-evaluation is critical to ensure long-running programs remain relevant; successes and disappointments are lessons that need to be evaluated and learned from. Change and adaptation can be nurtured. We hope that by sharing our process and the thoughts and motivation behind these actions and changes, we will help others engaged in their own evolutionary process.

Evolving Dialogues: Revisiting the Artist Interview

Sarah Barack, Steven O'Banion, Daniela Rivera, Gwynne Ryan, Matthew Skopek

The artist interview is one of the most valuable tools in the contemporary art conservator's toolbelt, and it's been over two decades since the field began to critically examine and formalize the practice. To close this session, co-hosted by Voices in Contemporary Art and the Contemporary Art Network, we'll ask contributing authors and the audience to reflect on how their approach to eliciting, analyzing, and sharing information from these dialogues has evolved over the years.

Contemporary Art + Electronic Media

Branching Out: Conservation of Nam June Paik's Who's Your Tree at the Indianapolis Museum of Art

Allison Slenker; Authors: Lance Pruitt, Allison Slenker, Sarah Trew

Nam June Paik's Who's Your Tree is a monumental, site-specific video installation that has been a centerpiece of the Indianapolis Museum of Art's contemporary collection since its creation in 1996. The artwork is a large-scale tree-shaped video installation composed of 31 thirteen-inch cathode ray tube (CRT) TVs to make up "leaves and branches" and three twenty-five-inch CRT TVs for the "trunk." The video contents feature iconic symbols and representations of Indiana including drag races, the state flag, native wildlife, and residents of the Hoosier state. The videos mirror the Indiana state flag with 19 stars and torch images and provides a familiar entry for Hoosier audiences to engage with TBM.

Despite its significance, Who's Your Tree was entombed in a walled-off gallery for more than thirteen years due to frequent breakdowns of the TVs and limited spaces where the fifteen-foot-tall installation can fit within the galleries. Without thorough documentation, institutional lore about the condition and functionality teemed with contradictions. But, in the autumn of 2021, the artwork was selected as a high-priority inclusion for an exhibition of contemporary art at the museum. With less than two years to undertake the needed preparations, and scarce monetary resources, it was clear that collaboration with colleagues throughout the IMA and beyond would be critical to successfully treating this important work for the collection.

As TBM ages, conservation teams without TBM specialists may be tasked with addressing the issues posed by these multifaceted objects. This talk will explain how, with few resources and little time, the IMA built a team to address these challenges and ultimately succeeded in getting this important work back on view. The talk will address the essential nature of collaboration to this effort and the complex stories of the artwork's place in the IMA's collection for nearly 3 decades. Lastly, this talk will discuss the many possible futures for this work include digitizing the three video files to be able to play them on media players instead of DVD players as well as continue researching and testing possibilities for the eventual retrofitting of the original CRT technology with updated screens within the current monitor based on precedents from several other ground-breaking Nam June Paik treatments at other institutions.

Collaborative Voices: Preserving Alan Rath's Electronic Legacy Through Shared Knowledge

Elisse Brautigam; Authors: Elisse Brautigam, Jim Campbell, Joshua Eveland, Wyndham Hannaway, Kate Moomaw-Taylor

This presentation explores the power of collaboration in preserving and understanding three seminal electronic artworks by Alan Rath in the Denver Art Museum's collection: "Looker II" (1990), "Family" (1994), and "Sky Watcher" (1990-91). These complex pieces, incorporating Cathode Ray Tube (CRT) monitors, custom circuitry, and Erasable Programmable Read-Only Memory (EPROM) chips, embody not just technological innovation but also the artist's unique vision. Our conservation approach demonstrates how engaging a range of voices and expertise can enrich our understanding of an artwork's history, meaning, and preservation needs.

At the heart of these artworks lie the EPROM chips, a now-obsolete technology that poses unique conservation challenges. These chips store custom software and image data essential to the artworks' functionality. However, their UV-sensitive nature renders the data vulnerable to erasure if exposed to light, making them a fragile link to the artist's original programming and intent.

Our preservation efforts centered on two key collaborations. Joshua Eveland of Nolara Conservation Services LLC, who worked closely with Rath in his later years, provided crucial insights into the artist's philosophy and technical practices. Eveland shared valuable information about the artworks' construction and potential emulation strategies, offering guidance on CRT preservation and circuit board documentation.

Equally vital to our efforts has been the expertise of the artist Jim Campbell, a contemporary and friend of Rath. Campbell's deep understanding of EPROM technology and its use in electronic artworks has been crucial in addressing the technical challenges we face. He shared his extensive experience with EPROM technology, discussing the types of chips used in Rath's work and explaining the risks associated with data loss.

This collaboration will culminate in a planned visit by Campbell to the museum in October 2024, where he will use an EPROM reader to access and migrate the fragile data to the museum's cloud storage, ensuring long-term preservation of Rath's original programming and image files. Campbell's expertise has also been crucial in navigating the potential pitfalls of data recovery, including the possibility of "uncopyable" chips made by the artist.

In recognition of Eveland's and Campbell's significant contributions to this project, we plan to invite them to be co-authors of this presentation and any subsequent publications. This co-authorship acknowledges the vital role that artists and technicians can play in the conservation of their peers' work, bringing unique insights and technical expertise that complement traditional conservation approaches, as well as the indispensable nature of interdisciplinary collaboration in the field of electronic art conservation.

By engaging with those who knew Rath and his work intimately, we gained insights into his creative process and the intended viewer experience that inform our preservation strategies. Collaborating with another artist not only enhanced our technical understanding but also deepened our appreciation of the artworks' cultural and historical significance in seeing it through Campbell's eyes. Our presentation will highlight how these collaborations shaped our conservation methodology, from documentation and maintenance planning to the ethical considerations of component replacement and potential future emulation. In addition to the successes, we will discuss the practical challenges of this collaborative model and how we navigated them.

Meet RALPH: The Reliable, Archival, Longterm Preservation Helper

Cass Fino-Radin; Authors: Cass Fino-Radin, Samantha Owens

Sam Owens and Cass Fino-Radin present the outcome of the latest collaboration between Glenstone and Small Data Industries: the debut of a new user-friendly app for automating and managing fixity checks and uploading incoming acquisitions in media collections. This ambitious project was only possible thanks to a foundation of many years of collaboration. It exemplifies what is possible when trust between conservation, IT, and outside consultants has been actively cultivated.

Small Data developed the app to meet the specific needs of Glenstone's team. As with many art museums, Glenstone faced challenges in identifying tools that were both easy for collections staff to use and cost-effective. Existing tools in the digital preservation field were designed mainly for libraries and archives. As such, they are often either too complex, requiring advanced technical expertise, or prohibitively expensive because they were intended for large-scale institutional use. Glenstone needed a solution that would be accessible, capable of handling the specific needs of its collections staff, and scalable for future growth.

This app offers a streamlined approach to collections staff interaction with, and oversight, of digital collections storage. It is manageable for institutions of all sizes and requires minimal technical expertise to implement while offering robust, scalable features for those who need it.

Key aspects of the presentation will include discussion and exploration of:

1. The context of the project at Glenstone and the needs that were to be addressed
2. The collaborative process including the importance of long-standing professional relationships and effective communication in the design and software development projects.
3. The challenges and rewards of such collaborations within the context of art museums, including insights for institutions considering similar projects.
4. Live demonstration of the app, providing an overview of its functionality and user interface.
5. Reflection on the history and sustainability of software development in cultural heritage contexts.

Our presentation will share insights into how this project has met Glenstone's specific needs, providing solutions for accessible digital preservation in an art museum context. We will reflect on the collaborative design and software development process, the history of solving similar challenges in the cultural

heritage space, and details on the public release.

By sharing this experience, we hope to introduce this new tool to attendees and also inspire institutions that may be considering collaborative projects involving software development in the context of collections management. We'll emphasize how such projects can lead to solutions that not only solve immediate problems but also contribute to the broader field of digital preservation in art collections.

Balancing Aesthetics and Functionality: A continuous refinement to care for design objects

Shu-Wen Lin, Chantal Willi

The San Francisco Museum of Modern Art (SFMOMA) formed the Architecture and Design curatorial department in 1988, focusing on works of graphic design, product design, furniture and architecture. In the context of modern and contemporary art museums, SFMOMA has adopted the shared practices to collect and display design objects as aesthetic objects without its functionality. In 2014, SFMOMA, along with support from the Adrew W. Mellon Foundation, launched four-year Artist Initiative to develop a series of interdisciplinary research projects. Acknowledging the limitation of traditional display methods, SFMOMA investigated new approaches to collect, display and conserve design in the 21st century. In-use video was one of the strategies responding to the transformation of design with complex digital elements and interface. By producing in-use videos for two exhibitions (2015 & 2018), SFMOMA was able to present various functions in use that could not be understood by static display formats, and helped make the hidden world accessible without turning on the object while on display.

During the two-year preparation for Art of Noise (2024), an exhibition dedicated to audio technologies, we have observed an interest shift to actively acquire and present design object's functionality. To show playback functions of media players in the exhibitions, incoming accessions and selected collection objects were studied, tested, serviced and repaired for the filming of in-use videos. To address the emerging interests and challenges, we have been revisiting our institutional policies and lay out our mission, resources, and timelines it may require to care for functional design objects. Additionally, we spoke to our colleagues in the other institutions to learn if they have experienced a similar shift to present the full lifecycle of object functions and provided insights into the potential landscape change in collections care.

The aims of our endeavor are two-fold––addressing the evolving focus and the additional expertise and workload for ongoing and future activations. We started by asking the following questions: what happens if functionality becomes an element to be acquired? How can we test and keep track of its maintenance requirement? How does the desire to show functionality influence our conservation practice and what's the proper scope? Through collaborative whiteboard exercises, we worked on disentangling layers of decision-making by different stakeholders and defined several sets of categories for design objects with electronic functions. As modern devices are often designed to be multi-purpose, we further identified groups of functions and their needs of care. Starting from the pre-accession process, we continue to reshape the process by introducing the in-take form and activation record which led to defining a terminology that can be agreed upon. In this paper, we would like to share our efforts to construct a holistic approach and initiate conversations with the community as we continue to refine our practices to care for functional design objects.

Exploring 3D Documentation for Time-based Media artworks: Case Studies from the Smithsonian Institution

Ana Gabriela Calderon Puente

In recent years, image-based 3D reconstruction has become an important tool for documenting heritage objects. In the case of time-based media artworks (TBMA), the inherent complexities of their ephemeral and technological nature present unique challenges in their documentation. These artworks only exist in their installed state, meaning their components and configurations may change with each iteration. In this context, 3D reconstruction can complement current documentation systems and provide an innovative way to capture detailed information and process the interaction between audiovisual, sculptural, and equipment elements.

As part of my conservation fellowship at the Smithsonian Institution, specifically within the Time-based Media and Digital Art Working Group (SI-TBMA), my research focused on the exploration and application of 3D models to document and reconstruct TBMA. The goal was to assess both the potential benefits for conservation processes and the limitations of these techniques. The research methodology involved selecting four case studies from three Smithsonian museums and proposing a workflow for the digital reconstruction of each artwork. I utilized photogrammetry and solid geometric modeling techniques to create accurate and detailed models.

By collaborating with different museums of the Smithsonian Institution, I was able to implement 3D documentation methods across these four case studies: Electronic Superhighway: Continental U.S., Alaska, Hawaii by Nam June Paik (1995), Cloud Music by Robert Watts, David Behrman, and Bob Diamond (1974–1979) from the Smithsonian American Art Museum, Four Talks by Laurie Anderson from the Hirshhorn Museum and Sculpture Garden, and An Atlas by Es Devlin from the Cooper Hewitt Museum. Each of these artworks presents distinct challenges, from their creation and exhibition to their installation and long-term preservation, providing a diverse range of technical insights.

Based on the analysis of these case studies, I developed a guide that compiles strategies and workflows for 3D documentation of TBMA. The guide addresses the selection of scanning tools, image-based 3D reconstructions tools, the processing of 3D models, metadata management, and key questions to adapt these techniques to different types of installations. It also includes recommendations for implementing this type of documentation in other settings and for other artworks that share complex technological features.

3D documentation complements existing traditional methods and is especially useful in installations that integrate multiple components, both audiovisual and sculptural. It also provides a deeper technical understanding of specialized equipment and complex systems, facilitating decision-making during installation, iteration, and technological change during the artwork's life. Adding animations to the 3D models offers a visual and interactive experience that can be helpful for preserving and restoring TBMA.

Teams of Care: Transfer Data Trust and the Case for Networked Artist Studios

Regina Harsanyi, Kelani Nichole; Authors: Sasha Arden, Eddy Coloton, Regina Harsanyi, Taylor Healy, Kelani Nichole, Claudia Roeck

The Transfer Data Trust project exemplifies the power of collaboration in addressing the critical challenge of preserving born-digital artworks. This innovative initiative brings together six time-based media conservators, two developers, five pioneering digital artists, and the founder of TRANSFER Gallery to create an open-source system architecture and toolkit for a webring of artist-owned repositories. Initially focused on a decade of digital art exhibitions from TRANSFER Gallery (2013-2023), the project aims to develop a scalable model that any artist, institution, or collective can adopt to establish private networks of redundant storage for the long-term preservation of digital cultural heritage.

The importance of this project lies in its novel approach to tackling persistent problems in digital art conservation: obsolescence and long-term sustainability through distributed storage. By involving artist studios directly in the preservation process and combining the knowledge of conservators, technologists, and curators, we're exploring how interdisciplinary collaborations and cooperative stewardship can reshape our approach to media art preservation in the 21st century. This project is particularly significant as it addresses the urgent need for innovative preservation strategies outside of museums.

Our methodology, co-designed by this diverse team, combines conservation practices with innovative technology. The first year will include condition assessment and documentation of 15+ international art series, development of a redundant storage network across international artist studios, implementation of content-addressed versioned file storage, creation of detailed metadata schemas, and establishment of a time-banking system for pooling conservation

expertise. The project's initial phase focuses on the works of five pioneering digital artists: Carla Gannis, Lorna Mills, Huntrezz Janos, Eva Papamargariti, and Rosa Menkman. Their diverse practices, ranging from glitch art to complex virtual environments, offer a rich testbed for our collaborative preservation strategies. Artists have been paired with many conservators involved in the Electronic Media Group at AIC including Sasha Arden (Guggenheim Museum), Eddy Colloton (previously Denver Art Museum and Hirshhorn Museum), Taylor Healy (The Art Institute of Chicago), Regina Harsanyi (Museum of the Moving Image), and Claudia Roeck (Haus der Elektronischen Künste).

Preliminary results from our prototype phase are promising. We have successfully set up a private network between network-attached storage drives in each artist studio and organized artist projects into artist information packages stored redundantly across the network. We've developed a standardized condition reporting template for born-digital artworks that is adaptable to various media types. A user-friendly interface for artists to manage their repositories has been created by Ryan Betts and Andrew Vivash, empowering them in the preservation process. Additionally, we've established partnerships with organizations like Gray Area Foundation and NYU Tandon School of Engineering, expanding our collaborative network. The project's significance has been recognized with funding from the Knight Foundation's Tech Expansion Fund, supporting our ongoing research and development.

Our findings suggest that this collaborative, distributed network approach can significantly extend the lifespan of digital artworks by reducing reliance on centralized storage and starting the documentation process much earlier in the lifecycle of these artworks. It empowers artists to participate actively in the long-term preservation of their work, facilitates more efficient sharing of conservation resources and expertise across institutions, and provides a scalable, open-source model for others to establish their own distributed repositories. Importantly, it has the potential to shift the artist's relationship to equity in their work, reminiscent of the historic Artist's Reserved Rights Transfer and Sale Agreement of the 1970s, but updated for the digital age.

This project contributes to the field of conservation by demonstrating how collaborative, interdisciplinary efforts can produce practical, scalable solutions for digital art preservation. By open-sourcing our methodologies and tools, we aim to benefit the broader artistic community and advance the field of time-based media art conservation. It challenges us to rethink traditional conservation roles and institutional boundaries.

Electronic Media

Machine Learning in Art: Tools, Techniques, and Implications for Conservation

Deena Engel

How is machine learning used to create works of art? How do machine learning technologies work? What are the various software tools and programming languages that are available to artists? What are the conservation problems that arise with each of these techniques?

The software applications that artists use for creating works of art which integrate or are based on machine learning fall into several categories. For artists who do not know how to program, or prefer not to program, and/or do not have opportunities to collaborate with programmers, there are text-to-image applications in which an artist creates images generated through textual description. Examples from the New York City bitforms gallery exhibition DALL·E: Artificial Imagination (October 26–Dec 29, 2022) demonstrate this approach.[1]

Newly created images using text-to-image techniques can be loosely based on predefined styles provided by the software authors or company; or the artist can "train" a model to use style-transfer based on the artist's own original digital-born images or digital surrogates of physical artworks in order to instruct the software to computationally mimic the artist's own or another style. The Whitney Museum of American Art's xhairymutantx Embedding 2024 by Holly Herndon and Mat Dryhurst (2024) is an example of style-transfer.[2]

With advanced beginner or intermediate programming skills, artists may prefer writing original code such as Python scripts to generate new images based on style-transfer and other techniques. An artist at this level of programming skill can also write scripts to programmatically download images from the web that meet specific textual criteria, e.g., "watercolors of pink roses."

Building an original machine learning application requires great resources and advanced computational and programming skills. The artist Refik Anadol, in his talk at the Institute of Fine Arts in New York City on June 3, 2024, said that it can take over six months of teamwork at his studio to compile data and build the application for a work such as Unsupervised, which was exhibited at the Museum of Modern Art in New York City.[3] Managing a team to retrieve and prepare data sets, as well as collaborating with programmers to run and train machine learning models, requires extensive studio resources including hardware for data storage and processing, bespoke software that addresses the artist's vision, and a staff with appropriate expertise.

Each of these approaches brings up a specific set of questions regarding acquisition practices, documentation practices, preparation for future re-exhibition, and other conservation concerns. Answering these and other questions, focusing on the collaboration between institutions and collectors with artists and engineers, leads to conservation strategies for these fragile and complex artworks, as artists continue to explore the use of machine learning as an artistic medium.

[1] https://bitforms.art/exhibition/dall%C2%B7e-artificial-imagination/

[2] https://whitney.org/exhibitions/xhairymutantx

[3] https://www.moma.org/calendar/exhibitions/5535

Video Archives for Media Archaelogy: Steina Vasulka and Live A/V Processing in the 90s Lakeshore A

Joseph G Heinen Jr.

As we consider new tools and technologies for working with the video signal, it can be interesting to look back at key periods of innovation for digital video editing and manipulation. Steina and Woody Vasulka are "pioneers" of video and new media art and technology who spent their careers exploring the innate potential of the signal and pushed for new tools to facilitate this exploration.

Steina, in particular, was fascinated with advancements in real-time A/V processing for purposes of performances, interactivity, and immersive environments and worked with many engineers and software developers throughout the 90s to create and modify software for these purposes. In anticipation of an upcoming exhibit being organized by the MIT List Center, I have been going back into my days assisting the Vasulkas with their archive and exhuming rare videos documenting the development process for these tools which has led to further inquiry around what was not-yet possible to do with consumer-based open-source video tools from this time. This begs the question of what past efforts have been made to create artist-driven tools with an open-source ethos, the successes and failures of these efforts, and what archives of this content can do to better ensure these obscure and abstracted histories can be interwoven to form a more complete narrative around media histories.

Pay No Attention to that Unit Behind the Curtain: Identification, Assessment, and Documentation of Control Systems

Tom Ensom, Daniella Briceño Villamil

In this paper, we present recent collaborative work at Tate to advance the understanding and care of artworks incorporating control systems. Artworks can make use of dynamic elements which require management and coordination; for example, the dimming of lights, the driving of motors, or the coordination of multiple channels of audio or video. At the heart of such artworks are control systems: sets of components, typically involving programmed computer hardware, which choreograph the sequence of actions desired by the artist. While many of these technologies overlap with those used in software and computer-based art—a medium that has been a focus of research at Tate over the past decade—they differ in their reduced emphasis on material specificity and their tendency to remain inconspicuous when the artwork is displayed. In light of these differences, we identified control systems as a distinct challenge that would benefit from further research.

Building on our experiences in the conservation of software-based art, we examined a range of artworks where control systems play a critical role. Reflecting on both commonalities and unique attributes, this investigation led to the development of guidance designed to assist conservators at Tate, including:

* guidelines for identifying control systems, including common component types, and how they differ from software-based artworks;
* key considerations when condition checking and documenting control systems;
* measures to prepare for the future translation of control system functionality to new technologies, as a response to obsolescence.

We found that many principles applied to the conservation of software-based art remained relevant, but the relative importance of these shifted and certain activities (such as disk imaging) were less useful. Our findings placed particular emphasis on understanding the control sequence—the series of actions enacted by the control system. This entails a variable process of analysis and documentation which may require specialist expertise and provides the key to migrating the control system to new technologies in the future.

We have adopted the "control system" label as a pragmatic means of highlighting the conservation challenges associated with a distinct yet diverse group of artworks. While this has helped us advance our understanding, it is clear that this grouping is not homogeneous and we encountered artworks that defy categorisation. This illustrates the limitations of medium-based terminology and the evolving nature of artistic practices which will continue to transcend medium-led conservation approaches. It underscores a need for well-resourced, interdisciplinary conservation work at points of acquisition and display, and for research time to be integrated into these processes as we continue to learn. With control systems present in many collections, and potentially falling under the radar of time-based media conservation projects, our findings have broader implications. We hope this paper will spark a wider conversation and foreground the power of interdisciplinary collaboration to influence future care and preservation strategies for these artworks.

Refining Workflows: Using the Iteration Report as an Advocacy Tool

Adrian Hernandez, Caroline Gil Rodríguez; Authors: Adrian Hernandez, Kirston Otis, Caroline Gil Rodríguez, Flora Schaeffer

The iteration report, first proposed by Joanna Philips, has been used in conservation to document different manifestations of a time-based media artwork with the understanding that each iteration results in changes to the work. These reports often encourage the writer to reflect on the iteration in terms of the appearance of the work, decision-making processes that led to the final result, and to assess whether it was successful and why.

In one instance at the Museum of Fine Arts, Houston, we used the iteration report on a loaned artwork to not only reflect on the final appearance of the artwork, but also to consider the entire installation process for time-based artworks at the museum. The Museum recently hired a time-based media conservator; thus, some of the aims of this iteration report were to diagnose inefficiencies in current workflows as well as creating an ideal iteration report to serve as a model for future reports. The report was written in a collaborative manner with stakeholders in the Audio/Visual and Registrarial Departments. We are choosing not to name the artwork because it is not owned by the museum. This artwork's installation, which was its second iteration, necessitated purchasing new equipment and altering the exhibition space which resulted in delays to the opening. The installation also coincided with other installations with tight deadlines, which placed intense pressure on museum staff. The iteration report served as a vehicle that allowed us to track where workflows could be improved to avoid having those same challenges in the future.

To aid us in this reflexive practice, we made some modifications to the report. We created a timeline to note every decision that was made about the work from the moment it was considered for exhibition through the end of the exhibition, expanding the focus beyond the final presentation of the work. We also rigorously documented the labor involved in installing the work and creating the report. After the report was written, it was used as a tool to inform workflows for installing other time-based media artworks. This use of the iteration report became a catalyst for change in the museum with respect to how time-based media artworks are understood and handled, and therefore became a tool for internal advocacy. This adaptation of the iteration report could serve as a model for other stewards who are advocating for improved time-based media workflows in their institutions.

More Than Meets the Eye: New Methods for Testing Artwork Iterations

Emma Dickson, Cass Fino-Radin

In this presentation, Emma Dickson and Cass Fino-Radin explore the critical role of interdisciplinary collaboration in advancing the field of time-based media art conservation. Aligning with the conference theme "What's Your Story: The Power of Collaborations," we argue that the most innovative and effective conservation practices emerge when we blur traditional role boundaries, deconstruct established hierarchies within our field, and facilitate opportunities to exchange practical skills between practitioners.

Through years of cross-disciplinary collaboration on the treatment and migration of complex and interactive time-based media artworks, we have developed and refined new methods for assessing treatments, expanding beyond traditional visual inspection and the limits of human perception. These new methods—which are reproducible and quite accessible—will be shared by illustrating their application to two specific works of art: Tall Ships (1992) by Gary Hill and Ten Thousand Cents (2008) by Aaron Koblin and Takashi Kawashima.

These case studies will illustrate the specific tactics and methodologies used to apply two new universal principles for assessing time-based media works that have emerged from our collaboration:

1. Automation of interactivity for consistent artwork testing

2. Measurable and time-synchronized comparison of iterations

As the field of time-based media conservation continues to mature, integrating these principles into practice is essential for maintaining the integrity of

time-based media artworks through successive conservation treatments. By providing conservators with replicable, objective means of assessment, these techniques help minimize unintended alterations that would otherwise inevitably accumulate over time.

The development of these new methods demonstrates how interdisciplinarity when extended beyond collaboration into individual experience and training that bridges into one's collaborator's field, can enhance conservation practice and yield the kind of innovation our specialization needs to steward the art of today and tomorrow.

Learning on the Job with Maintenance Culture: Creating a digital media art preservation Field Guide and trainings for small shops and artists - a 90 minute panel

Joseph G Heinen Jr., Frances Harrell, Elena Cordova; Authors: Frances Harrell, Joseph G Heinen Jr., Joana Stillwell

While larger museums move forward with their Time Based Media collections, smaller and mid-size institutions continue to struggle with preservation planning for these complex contemporary works without easy access to media conservators - especially if they are all digital. Maintenance Culture is a project created by Myriad, funded by the National Endowment for the Humanities, to address challenges related to preserving complex, born-digital, creative works in smaller institutions. From 2022 - 2024, Maintenance Culture brought together creators and maintainers of digital design, web art, time-based media art, virtual reality, and more to address pressing challenges of preserving these works in small institutions. Through a Design Charrette and various working groups, Myriad organized across institutions and disciplines to create events, workshops, and guidelines for creators and maintainers (curators, conservators, librarians, other cultural heritage workers) who preserve digital design, time-based media art, net art, augmented reality, and more.

Workshops were offered in 6 cities across the U.S., focusing on mid-sized cities including Baltimore, Houston, Detroit, and New Orleans. Participants included cultural heritage professionals from a wide range of institutions seeking to provide long-term access to complex digital creative works. Participants shared experiences, discussed best practices, and worked across disciplines to consider new solutions for preservation of complex objects.

Project staff had ideas about preserving born-digital works at the start of the project, but the addition of artists' knowledge provided insights into their creative process, intentions, and skill sets that changed the course of the work. We will share information about the implementation of the project, insights learned through the project, ways that collaborations with creators shaped the outcomes of the work, and lessons learned. We will include evaluation data showing workshop participants' achievements and reactions, and we will also talk about the future of Maintenance Culture, which has secured a new round of funding from the NEH and will continue through at least 2026.

Objects

New African Masquerades: Flexible mounts for a collaborative exhibition

Ingrid Seyb

The exhibition New African Masquerades: Artistic Innovations and Collaborations will open at the New Orleans Museum of Art in April 2025. Five masquerade ensembles were mounted in 2024 in preparation for this exhibition, a challenge with no mountmaker on staff. This paper will detail the construction of the posable figural supports, made with aluminum tubing and locking hinges, and the decision-making across roles and continents that led to this design strategy.The exhibition aims to model more ethical ways to collect and display African art through direct commissioning rather than secondary market acquisitions, and collaborative presentation, emphasizing the ability of Africans to tell their own stories. To accomplish this, a team of eight people was assembled-three masquerade artists from Nigeria, Sierra Leone, and Burkina Faso, three American scholars, each with a longstanding research relationship with one of the masquerade artists, another artist/researcher from Cameroon, a research director of a museum in Senegal, and a curatorial assistant from Ethiopia.This team agreed that it was important for the display to reflect the liveliness of masquerade practice, and the physicality of the bodies inside the ensembles. Countering the history of Western museums displaying just the headpieces as abstract sculptures rather than full body suits worn by humans, the appearance of the bodies in New African Masquerades would impact viewer interpretation, and therefore their fabrication presented a variety of potential pitfalls.Specific poses were requested that standard retail mannequins could not provide. The ensembles weight and the five-venue schedule called for strength and durability. Shelly Uhlirs mounts for the NMAIs exhibition Circle of Danceprovided both conceptual inspiration and a specific product that became critical to the project: a click-adjustable aluminum hinge. These allowed the construction of strong supports without welding for asymmetrical, naturalistic poses, with the added benefit of being partially adjustable even during installationinvaluable with a curatorial team of nine.Because of the artists preference for realism, the exposed hands and feet were cast in epoxy and painted brown. The weighty history of museum displays of Black bodies has been previously discussed, notably by Stephenson and Gunsch, and the appropriate degree of realism as well as the color was carefully considered by the team.Also presented will be lessons learned while installing with the full curatorial team, all nine of whom are planned to be present at NOMA, and the practicalities and ethics of the removal of original material required by the artists to meet their standards of beauty in display.

A Sterling Conservation Project: Preparing 1200 Pieces of Gorham Silver for Exhibition and Travel

Ingrid A. Neuman

Charged with preparing for the first comprehensive exhibition of the Gorham Collection of American silver since 1984, the Rhode Island School of Design (RISD) museum embarked on a volunteer-based "mass" conservation project. This Decorative Arts collectionis comprised of over 2,000 pieces and represents the largest holdings of Gorham in any museum collection. Dating from 1831-1981, the Gorham silver manufacturing company from Providence, Rhode Island, grew to be a substantial player in both the commercial market as well as the innovative art wares category. As theGorham Manufacturing Companyand the RISD Museum share the same town of origin, this particular conservation project resonated with much of the local community in a variety of unique ways. Three years in advance of the opening of the 2019 exhibition"Designing Innovation: The Gorham Manufacturing Company 1850-1970", the cleaning, polishing and stabilizing of the silver commenced. As the quantity of sterling silver objects proposed for display numbered 1250, an equally large number of vetted, and trainable, volunteers was needed to undertake such an ambitious conservation project. This conservation project ultimately involved managing 90 community and student volunteers. As Providence is comprised of many institutions of higher learning, a significant level of student participation could be incorporated into this hands-on project. A short video (Silver Linings, www.

risdmuseum.org) was created mid-way through this project to highlight five particular students, each traveling on a different educational path, who chose to dedicate their unstructured time to this collaborative project."Designing Innovation: The Gorham Manufacturing Company 1850-1970"was designed as a traveling exhibition. By harnessing the talent of graduate level students in theJewelry + Metalsmithing Department at RISD,an illustrated visual glossary for condition reporting was created which proved to be a unique and symbiotic learning opportunity for both the conservator and young, emerging fine art students. This illustrated silver digital reference was collaboratively further refined in tandem with the museum's registration department so that all of the terminology was composed of well-defined and non-ambiguous definitions to avoid any potential misinterpretation of condition issues during the duration of the exhibition. An additional academic opportunity presented itself for a capstone senior thesis project, focusing on a proprietary conservation material, was also another symbiotic educational oppportunity for reciprocal learning that benefited both the student and the museum.A highly collaborative project, the synergy created by a museum conservator working with a wide range of community volunteers was mutually beneficial in many creative ways. This paper will examine the ways in which a complex conservation project with a limited budget and staff can be organized and managed. Discussion will include the many creative interactions that resulted from the fusion of individuals with wide-ranging expertise from the Providence community. Creating a symbiotic working environment in which 90 untrained conservation volunteers could be identified and retained will be explored. Most importantly, the management of this conservation project required critical focus on training non-conservation professionals to use conservation protocols which were straightforward in interpretation and application.

Rediscovering and assembling painted wooden boxes from King Tutankhamun's collection: a collaborative approach

Ahmed Abdrabou; Authors: Medhat Abdallah, Ahmed Abdrabou, Ali Hussein, Gilan Sultan

The collection of King Tutankhamun (18th Dynasty, 1347–1337 BCE) has fascinated scientists and the general public since the discovery of his spectacular tomb in 1922 by the archaeologist Howard Carter. After the opening of the tomb, Howard Carter mentioned that Tutankhamun's tomb was robbed and the robbers destroyed many objects during the robbery; at least two boxes found dismantled in the entrance debris seem to have been employed by the robbers to carry off their loot. Alfred Lucas completed the restoration of Tutankhamun's collection in 1932, subsequently transferring almost all of the Tutankhamun objects to the Egyptian Museum in Cairo. Only a few objects were kept in the Luxor museum storeroom. In recent years, the Grand Egyptian Museum's conservation center (GEM.CC) has been devoted to the transportation and conservation of Tutankhamun's collection to be exhibited at the new museum (GEM). This study presents the role of conservation along with the archaeological data and scientific investigation at GEM.CC in the rediscovery and assembly of some broken painted wooden boxes from Tutankhamun's tomb after 95 years of keeping these parts separately in different museums.

After surveying the wooden boxes of Tutankhamun to gather more information on these boxes as a first step in our study, the second step included imaging techniques and optical microscopy to gather more information and to provide evidence on the techniques of manufacture, woodworking and identification of wood species. In the third step of our work, hand-held X-ray fluorescence spectroscopy (XRF), X-ray diffraction (XRD), and Fourier transform infrared spectroscopy (FTIR) were applied to determine the chemical compositions of the materials used in preparatory layers and the pigments.

The results of the collaborative approach led to the exciting rediscovery of three wooden boxes from Tutankhamun's collection. The work team succeeded in the assembly of more than 96 wooden pieces (like puzzles), most surprisingly discovering that these broken parts were originally two wooden boxes. Moreover, the work team succeeded in rediscovering and assembling a complete wooden box belonging to the royal family of King Tutankhamun inscribed with the names of Akhenaton and Smenkh-ka-re, which came to light for the first time after many years of keeping its parts separately in different places.

The protocols and decision-making procedures during the collaboration of conservators, curators, and scientists were successfully effective not only in rediscovering and assembling three wooden boxes but also in their display method inside Tut Gallery at the Grand Egyptian Museum (GEM).

Mighty Powder: Demonstrating that fumed silica increases the adhesive strength of Acryloid B-72

Renée Stein; Authors: Olivia L. F. Boyd, Elly Stewart Davis, Connie B. Roth, Renée Stein

Since its introduction to the field of heritage conservation by Stephen Koob in 1986, Acryloid B-72 has been used extensively for coating, consolidating, and adhering a wide range of materials. Revisited in 2018 for the AIC Objects Specialty Group, the recommended formulations of Acryloid B-72 include small amounts (0.1 weight % or 1 teaspoon) of hydrophobic fumed silica. This addition is stated to improve rheological and working properties, such as flow, film formation, and evaporation rate. Fumed silica is a commercially produced, low density, high surface area particulate agglomerate of silica nanoparticles. The resin and fumed silica mixture is, therefore, a polymer-nanoparticle composite. Since the mid-1990's research in polymer physics has demonstrated how adding tiny amounts of nanoparticles can cause large improvements in polymer properties resulting from the high interfacial area between polymer and nanoparticles. One of the characteristic features of polymer-nanoparticle composites is the increased strength imparted by very small amounts of nanoparticles. Research undertaken by the Physics Department and Carlos Museum at Emory University quantified the increase in strength relative to the amount of fumed silica in Acryloid B-72 mixtures. Recalling Koob's original tests with glass slides, we built an apparatus to measure the weight tolerance of joins made to glass rods with different formulations of Acryloid B-72 and fumed silica. The resulting data demonstrate the appreciable increase in strength, a near doubling, accomplished by adding fumed silica to the resin and suggest an optimal percentage for maximum strength. Further testing evaluated the sheer strength of joined ceramic sherds, comparing neat resin, Koob's mixture, and the optimal percentage derived from strength testing. Practical application reflects the capacity to use lower resin concentrations, allowing better penetration into cracks and voids, while still accomplishing joint strength due to the behavior of the polymer-nanoparticle composite.

In addition to summarizing the strength testing results for B-72 and fumed silica mixtures, this presentation considers the collaboration between student, professor, and conservators that enabled the research. An undergraduate physics major undertook the strength testing as an honors thesis project. The research of the faculty advisor focuses on soft matter physics, including how interfaces between components in polymer systems affect the physical properties and system dynamics. Her research group of graduate and undergraduate students develops experimental methods to understand the behavior of polymers and study the effects of temperature, mechanical forces, and other influences, such as particle interfaces. Conservators at Emory University's Michael C. Carlos Museum provided insight into field practice and offered input on experimental design. Conservators also evaluated the experimental results for their practical impact on application and use of the polymer-nanoparticle composites, conducting trials with mock-ups and artifacts. This sort of fundamental characterization of treatment materials can be difficult to accomplish in small conservation labs that are principally tasked with preventive collections care and exhibition-driven object interventions. Recognizing the opportunity of collaboration and developing the research as a student project are productive strategies. This project was also useful preparation for the student, who went on to pursue graduate work in materials science.

Exploring Consolidation of Degraded Natural Foam Rubber

Lindsay Cross; Authors: Lindsay Cross, Lauren Horelick

The degradation mechanisms of natural rubber have been studied extensively. At present, there is no known protocol for reversing, or even stopping, the degradation. This problematic material is prevalent throughout the Smithsonian's National Air and Space Museum's (NASM) collection. One collection subset of

concern is the foam rubber face pads on aviator goggles, dating from the 1910's to the 1970's. NASM has over 80 artifacts that fall into this subset. As foam rubber ages, it frequently requires intervention if loss of original material is to be avoided. Such interventions typically require introducing adhesives but the long-term impacts of using adhesives on degraded rubber are underexplored. This research project was designed to investigate the impacts of consolidating degraded natural rubber. The first phase of the project establishes a working definition of "natural rubber" and "consolidation" based on an extensive literature review. The second phase of the project includes testing of a variety of consolidants on foamed rubber samples. Currently, tests are being conducted to determine the efficacy of mixtures of isinglass and methylcellulose for use as a consolidant in both liquid and foam applications. The final phase of this project will include treatment of foam rubber face pads from multiple pairs of NASM's aviator goggles. While exploratory, the treatment is backed by extensive research and testing and aims to offer a viable protocol for consolidation of degraded rubber.

Bulked B-72 Fills

Carolyn Riccardelli

Bulked B-72 fills are a popular choice for conservators working with objects made of stone, ceramics, and plaster. Depending on the concentration of resin, choice of bulking agent, and working methods, bulked B-72 fills provide versatility of purpose that can range from structural to aesthetic. However, many conservators struggle with the material. This practical talk will cover long-refined methods for making the adhesive resin, provide suggestions for bulking materials, and show how to mix, knead, lay the material into the loss, and shape the fills. Making fills for dark stones as well as translucent marble will be illustrated with the use of detailed videos.

Fit to float: Conservation of a Painted Canvas and Birchbark Canoe

Fran E. Ritchie, Sejal Goel; Authors: Sejal Goel, Nicole Peters, Fran E. Ritchie

The Linklater/Warren canoe is considered to be the last indigenous object related to Isle Royale National Park. The canoe is an interesting style; mixing traditional Ojibwe birchbark canoe techniques with the early 20th century trend of canvas covered canoes. The canoe was built by John and Tchi-Ki-Wis Linklater, "the last Native Americans to live and work on Isle Royale" before the park designation. John Linklater worked as a guide for Frank Warren, a mining engineer from Minneapolis who was a champion of establishing Isle Royale as a national park in the 1920s. It is unclear if the canoe was made on the island for the specific use of guiding the Warrens, or if it was brought from Minnesota, and later purchased by Frank Warren. It is a "long-nose Ojibwe" canoe, which was common for border lakes Anishinaabeg. However, instead of traditional pitched edges to the bark, the entire canoe was wrapped in a green canvas that was nailed under the gunnels. Wood and canvas canoes were common in the 1910s and 1920s, suggesting an active aesthetic choice in the material, possibly made by the Warrens.

The canoe was given to the National Park Service in 1971. It was described when cataloged in 1983 in similar condition to that prior to treatment, with heavily soiled peeling canvas, the lack of two black ash thwarts, and damage to lashings and birchbark structure.

To ensure work was undertaken with the respect for the object's indigenous history, we conducted an outreach session with Ojibwe representatives from Grand Portage.

We treated the canoe to reduce the embedded soiling throughout the canoe, and to stabilize loose components, preventing future loss. Furthermore, discussions with current canoe builders were undertaken in order to ensure the further stabilization of the canoe by creating replacement thwarts. Following input from park staff to determine interpretation needs, we performed additional treatment to compensate for losses and create a visually cohesive canoe, retaining signs of use as part of the park's overall history.

The techniques used to compensate for losses in the canvas were pulled from those used by paintings conservators: spun bond polyester and BEVA 371 linings, and book and paper conservators: textured Japanese paper fills, in which a silicone mold is made of a similarly textured surface and acrylic paint is used to create a cast of texture, which can then be easily applied to Japanese paper, or used without as a thin film which can be heat set into place.

The combination of these techniques allowed for a cohesive appearance for the canoe, whilst still retaining reversibility as a core tenement, and provides an additional tool in the object conservator's toolbox for mimicking original surfaces.

"Turning the Feather Around": Conservation of a Monumental George Morrison Mural

Megan Emery, Courtney Murray; Authors: Luke Boehnke, Megan Emery, Mary LaGarde, Courtney Murray, Megan Randall

Founded in 1975, the Minneapolis American Indian Center is one of the oldest urban American Indian community centers in the country, providing educational and social services for a large and tribally diverse Native American community in the metropolitan area. As the building was being constructed, artist George Morrison (Grand Portage Ojibwe) was commissioned to design a mural for the south side of the building: the monumental artwork has remained an integral part of the Minneapolis American Indian Center façade for nearly 50 years. Primarily composed of over 800 Western Red Cedar boards of various lengths, the boards are assembled to create a repeating chevron and morning star motif. Never officially given a title, Morrison once suggested calling the mural "Turning the Feather Around: A Mural for the Indian".

In fall 2022, the Center began a major renovation to upgrade and expand the facility, which reopened to the public in May 2024. As part of the expansion, Midwest Art Conservation Center (MACC) was contracted to remove, conserve, and reinstall the mural in a new location on the renovated building façade, a location that was both more visible to the community and more exposed to weathering and wet/dry cycling. This was not a project MACC would (or should) take on alone. Collaboration was essential to make the project successful.

MACC partnered with Wolf Magritte, a design, fabrication and installation firm for complex works of art, to carry out the project. Project technicians were hired from the local community of Native artists to work alongside MACC and Wolf Magritte. The technicians were a great asset to the team, as they shared stories and history of the local Native community and acted as ambassadors of the project within the neighborhood. Most importantly however, was the collaboration and communication between the Executive Director of the Center, Mary LaGarde (White Earth Nation), architectural design teams, led by Sam Olbekson (White Earth Nation), Loeffler Construction, and other stakeholders that was crucial to inform complex decisions about the mural's new location and proposed preservation methods. This paper will provide an overview of the Mural's conservation, with an emphasis on creative design solutions for reinstallation and treatment decisions based on sustainable long-term care.

Radiography in the Round: Capturing and Viewing X-rays in 360°

Arlen Heginbotham; Authors: Robert Erdmann, BJ Farrar, Arlen Heginbotham

X-radiography has been used since its invention to study works of art. X-rays of complex three-dimensional objects, such as sculpture, are notoriously difficult to interpret because the X-ray 'flattens' the object into two dimensions and there is no easy way to tell if an observed feature is near the front, middle, or back.

The advent of direct digital radiography (DR) has allowed x-ray images to be acquired more rapidly and efficiently than ever before. The availability of relatively inexpensive computer-controlled turntables for the photography market has precise and repeatable rotation of artworks in the X-ray studio. By placing sculptures on a turntable and making a series of high-resolution radiographs at pre-set intervals (typically 72 images at 5° intervals), we allow researchers and other viewers to see the entire sequence of images and freely 'spin' the objects in X-ray view. This helps tremendously in understanding complex internal structures. After radiography is complete, a digital camera can placed in the position of the X-ray source and photographs can be made at precisely the

same intervals as the radiographs. This image set can be overlaid or placed side by side with the radiographs to further assist with interpretation of the radiographs.

Many sculptures or other 3D works of art are larger than a typical DR detector (14"x14" or 11"x17") We have designed and built a flexible and low-cost aluminum easel that allows the detector to be repositioned after each 360° rotation of the turntable. With the X-ray tube in the same position, the detector can be placed in an array of positions so that the entire object can be imaged in overlapping frames. For each detector position, the turntable rotates the subject through exactly the same series of positions, capturing an image at each. This process is easily automated using a two-monitor configuration for the control computer and simple task automation software. The resulting image sequences can be merged efficiently using movie editing software such as Adobe After Effects, yielding a single sequence of full-sized, high-resolution radiographs at regular angular increments.

Viewing and disseminating these radiography-in-the-round image sets presents certain challenges. Some product photography software can generate an interactive, browser-based viewer that allows the viewer to spin the image set and switch between X-ray and visible views but zooming can be awkward and slow refresh rate can be frustrating, particularly with large composite radiographs. A customized and optimized web-based viewer has been developed to overcome these obstacles and allow streamlined dissemination of radiography-in-the-round image sets.

Taken together, these developments should allow any museum radiography studio with a DR detector and an affordable automated turntable to capture, format, and disseminate their own radiography-in-the-round.

Perpetual Conservation: a continuing collaboration to conserve Jack Nelson's kinetic Sculpture Clock

Nicole Flam, Laura Kubick; Authors: Kristin Cheronis, Nicole Flam, Laura Kubick

Jack Nelson was an artist and educator who was part of the Experimental Studios in the College of Art at Syracuse University in New York. Although he was known primarily for his kinetic sculptural assemblages, as a teacher Nelson inspired a generation of multi-media artists including celebrated time-based media artist Bill Viola, to whom he served as an advisor.

Jack Nelson's Minneapolis Sculpture Clock was fabricated in 1967, and installed in 1968 on Nicollet Mall, Minneapolis' downtown pedestrian shopping street. An early example of integrated public art, the Sculpture Clock is the last remaining element of the respected historic design from the 1960s Mall, created by visionary landscape architect, Lawrence Halprin in an effort to keep downtown vibrant in the era of burgeoning suburban shopping malls.

From the start, this timepiece and artwork was engaging and distinctive, quickly becoming a well-known and beloved landmark. It is both a street clock, with 4 large dials in the upper cabinets of the case; and it is also a kinetic sculpture, or as the artist called it, a "Perpetual Motion Stabile." A 16' glass and steel case encloses a complex grouping of more than 830 copper alloy moving parts. After installation, the kinetic sculpture ran for 34 years, receiving minimal maintenance and occasional minor repairs and modifications by city workers to keep it running. However, by 2002, only the clock elements were still working. The kinetic artwork had ground to a halt. The motors were beyond repair; the metal was heavily tarnished; and there were many missing and broken elements.

A large-scale renovation of Nicollet Mall began in 2015. In preparation, the City of Minneapolis conducted research within the community about the existing collection of public art on the mall. The results showed that Minneapolitans felt the Sculpture Clock contributed to the community, provided continuity with the Mall's past, and was the work of art that the public most hoped would return after the redesign.

Between 2015 and 2017, KCI Conservation undertook the complex, collaborative conservation treatment of Jack Nelson's perpetual motion sculpture and clock. A team was assembled consisting of KCI conservators and interns, clock experts, metal artists and fabricators, electricians, engineers, and Minneapolis' public art administrators. After discovering a remarkable trove of historic documentation, KCI was able to repair and restore the intricate kinetic sculpture, replacing motors and re-creating missing elements, re-engineering hidden functional components for longevity, as well as repairing and returning the clock case and clock dials to their intended appearances.

Since the full conservation treatment, KCI continues to work with members of the treatment team to carry out regular inspections and maintenance on the Sculpture Clock, thanks to an ongoing commitment to its upkeep by the City of Minneapolis and the Minneapolis Downtown Improvement District. In 2024, the clock received another conservation treatment after an incident of vandalism which shattered the glass on one of the case doors. This paper explores the history, treatment, and continuing work it has taken to conserve this extraordinary example of public art.

Gorgonized by Her Monsterful Snoutfair Visage: Harriet Hosmer's Medusa in Context

Clara Livingston Bailin

To be strong and powerful, a woman must be monstrous, dangerous, other. That has for centuries been the take-away message behind the Medusa myth. To label a woman a Medusa or Gorgon has been to rationalize or demean her power by making her threatening, inhuman, and therefore deserving of attack and ridicule. This was true in 2016 when Presidential candidate, Hillary Clinton was called Medusa in media, is still true eight years later, and was very much true when Harriet Hosmer carved Medusa in 1854.

In November 2020, as the newly arrived Mellon Fellow in Objects Conservation at the Detroit Institute of Arts, I hiked up to the American Neoclassical gallery to examine this prized piece earmarked for cleaning and fill adjustment. I found a typical neoclassical ideal bust, which showcased many of the skills that earned Hosmer her contemporary reputation as one of the great sculptors of the period—her anatomical modeling, thoughtful composition, and attention to subtle textural detail. Through the subsequent weeks of treatment, including the removal of a visitor's unsanctioned lipstick kiss, I became fascinated by the reflection this carved-marble piece presented of the difficult social lines Hosmer walked in her own life as an independent artist, expat, and queer woman defying gender stereotypes even within the medium she chose to sculpt.

When the Medusa was deinstalled to the conservation lab, she arrived plastered to her pedestal top, covered in discolored wax fills and irregular surface dirt, holding remnants of previous cleanings and coatings in the recesses, and sporting a red-brown lipstick print on her proper left cheek. The subtle textures for which Hosmer is known were disturbed by fine abrasion, areas of unsaturated opacity, and now yellowed oil application. Additional examination under ultraviolet radiation revealed an interesting handling history. I tested various poultice applications and experimented with fill materials to replace the aged wax, ultimately settling on a combination of mechanical action and buffered solutions to even the appearance. I also grew to understand the Medusa with every step of the process.

In context, this piece is a commentary on the status of women in the period of change leading into the American Civil War and a subtle juxtaposition of mythological and artistic tropes that empowers women through the subversion of both. Hosmer placed the Medusa and her message as the subject of a sculpture style that marketed woman's bodily suffering and subservience to faith and man as feminine virtues. In so doing, strength and power are shown as regalia a woman may carry with grace and pride, if not freedom. The 1850's were an early time of change toward a more modern valuation of women's education and societal contribution; however, American women were still second-class citizens stuck largely in traditional roles without legal autonomy—a contradiction exposed in Hosmer's Medusa. In this regard, the kiss strikes me as a sign of Hosmer's success—a crowned Medusa is shown approachable, sympathetic, her innocence returned and blessing conferred all wrapped in a blatant act of violation.

Still Got The Blues: The Technical Study and Conservation Treatment of a Tian-Tsui Headdress

Devon Lee

The focus of this presentation is the investigation and treatment of a tian-tsui headdress from the collection of the Museum of Chinese in America (MOCA).

This project was completed in an advanced graduate course at the Conservation Center of the Institute of Fine Arts, New York University, under the supervision of Judith Praska Distinguished Visiting Professor in Conservation Pamela Hatchfield. The course was designed in collaboration between Hatchfield, MOCA Director of Collections Yue Ma, and private conservators from A.M. Art Conservation, LLC: Rachael Perkins Arenstein, Anne Léculier King, and Eugenie Milroy.

MOCA was founded in 1980 and began as a grassroots organization with community-driven collecting practices and the guiding aim of preserving and sharing the diverse tangible heritage, oral histories, and cultural experiences of people of Chinese descent in the United States. Some of its earliest accessioned objects were brought in by museum staff, donated by Chinatown residents, or even collected from the curb; as such, there is limited or nonexistent provenance for many items in the collection, the tian-tsui headdress included. MOCA is in the process of recovery and new growth after a devastating fire in 2020, and the headdress is among the objects that sustained damage related to this event. A driving goal of this project was thus to research and prepare the headdress to go on display alongside other conserved MOCA objects when the renovated museum reopens in 2025.

The headdress is skillfully constructed in the style of a dianzi, an ornate, horseshoe-shaped headdress worn by wealthy Manchu women in the Qing Dynasty (1636–1912 CE) for festive occasions. A woven framework of black silk-wrapped rattan cane supports dozens of gilt copper openwork and filigree ornaments set on wires and springs that allow them to tremble with the movement of the wearer, a style that can be traced back to the buyao ("step-shake") hair ornaments of the Han Dynasty (206 BCE–220 CE). The ornaments are further decorated with tian-tsui (or diancui, literally "dotting with kingfishers"), an ancient Chinese decorative tradition related to cloisonné that utilizes the cut feathers of kingfishers to create striking inlaid motifs in various shades of blue.

Prior to treatment, the aesthetic value of the headdress was diminished by physical deformation that suppressed the stylistically essential trembling movement of the gilt copper ornaments. The headdress was further disfigured by delamination, detachment, and loss of the tian-tsui decoration resulting from failure of the original water-soluble adhesive used to secure the kingfisher feathers to the metal ornaments. In collaboration with MOCA and A.M. Art Conservation, a holistic understanding of the context and manufacture of the headdress was produced through in-depth research and instrumental analysis. With respect to tian-tsui craft tradition, sustainability principles, and the priorities of MOCA staff, a complex but appropriate structural and cosmetic treatment methodology was devised and executed: the conservation intervention involved stabilizing the tian-tsui inlay, reshaping the crushed buyao ornaments, and developing an innovative approach to kingfisher feather inlay loss compensation. This presentation will describe the pitfalls and successes therein.

When Art Meets Engineering: Collaborative Approaches to Outdoor Sculpture Installations at the Toledo Museum of Art

Emily Cummins

This presentation shares the story of two large-scale outdoor sculpture installations at the Toledo Museum of Art's Georgia Welles Sculpture Garden—Josiah McElheny's Moon Mirror (2019) and Roxy Paine's Interim (2002) —and highlights how collaboration and lessons learned from one project informed the success of the other. Both installations involved unique conservation challenges and relied heavily on cross-disciplinary teamwork, demonstrating the impact of connections and shared problem-solving.

Moon Mirror, a mixed media work incorporating glass blocks within a stainless steel frame, was acquired by the Toledo Museum of Art (TMA) in 2022. Its installation, however, faced significant delays due to unforeseen revisions needed for the sculpture's substructure. These changes required close collaboration between conservators, engineers, and the artist to adapt the design for outdoor conditions and ensure the long-term stability of the piece. The challenges presented by Moon Mirror offered valuable insights into how to manage mixed media artworks in outdoor environments, influencing future decision-making and preventive strategies.

Building on the lessons learned from Moon Mirror, the installation of Roxy Paine's Interim benefited from a more streamlined approach. This sculpture, an early work in Paine's Dendroid series which stands at over 35 feet tall, came with its own set of technical challenges, particularly related to its size, assembly, and structural requirements. Installed on a tight timeline as part of a major bequest, the project required collaboration with engineers, riggers, and welders. By applying strategies developed during the Moon Mirror installation, the team was able to address complex issues more efficiently, ensuring that Interim was installed on schedule and with a preservation strategy that also kept the artist's vision in mind.

Both installations involved close collaboration with the artists, who played key roles in site selection and decision-making, further emphasizing the importance of building strong connections between conservators, allied professionals, and living artists. The lessons from Moon Mirror not only informed the technical execution of Interim but also reinforced the value of shared knowledge and adaptive problem-solving across projects.

This presentation explores the pivotal role that collaboration played in both installations, highlighting how the challenges faced and lessons learned from one project can directly inform the success of another. Attendees will gain insights into the power of interdisciplinary partnerships and the ways in which past experiences can drive innovation and more effective conservation outcomes in future projects.

My Kingdom for a Drain: The Collaborative Treatment of Robert Gober's Untitled Installation

Stephanie Cashman

Since the mid-1980s, American artist Robert Gober (b. 1954) has been at the forefront of revitalizing representational sculpture. Gober's works explore themes of childhood, domesticity, sexuality, religion, and politics through familiar objects such as doors and sinks, questioning how they contribute to our psyche. His unusual lexicon of meticulously hand-crafted common household objects are marked with surrealist twists or mutations such as X-shaped cribs, doors turning in on themselves, and legs protruding from walls. This phantasmagorical theme is also found in his wax sculptures of human body parts merged with domestic items in bizarre variations.

Throughout his career, Gober combined these elements to create complex installations, as seen in the untitled work at the Milwaukee Art Museum (MAM) —fondly called "the suitcase". An imposing black, open suitcase with a grate inserted in its base that sits on the gallery floor. Peering into the suitcase reveals a subterranean world through a brick shaft in the floor. Below is the "Gober Room", housing a large pool of water with a set of wax adult male legs and baby - an allusion to baptism. A motor and fan create gentle lapping of the water, which swirls around the legs, and causes the seaweed to sway. Like much of Gober's work, this installation explores the dynamic between the immediately apparent conscious world and the subconscious lurking beneath.

Since its 1999 acquisition the various sculptural and mechanical elements of Untitled have shown wear, and biological growth bloomed in the pool—drastically changing Gober's intended experience of the artwork. Tackling this herculean endeavor and addressing the various, complex elements of this installation required many hands. For more than two years, the conservation team at MAM collaborated with other museum experts and allied professions to perform the most comprehensive treatment of this work to date in order to accomplish the ultimate goal of recapturing the artist's original intent—to immerse viewers in an animated, watery scene.

This project started with conservator Christian Scheidemann, an expert in Gober installations, treating the pool and legs and fabricating new seaweed. The next step was to address the hot and humid environment in the "Gober room" to slow biological growth. A lighting technician replaced the hot lights with theater-style LEDs that mimic daylight, as specified by the artist's studio. MAM's Facilities crew added ventilation to increase airflow and control the temperature of the space. Regaining the subtle sound of the sculpture has been the more dramatic transformation of the treatment. The original motor drowned out the sound produced by the water's soft lapping. A new, quieter motor was designed and constructed by a local engineer and the ambient noise was reduced. Working with a flooring expert, visually distracting flooring around

the suitcase was also corrected.

The final step was to treat the suitcase and drain. This required consultation with the artist's studio and the Schaulager Museum to determine the scope of treatment and acceptable level of change while maintaining the artist's original intent and integrity of the artwork as it ages and technologies change.

Collaboration on Restoring Henry Moore's Bronze Form at the Getty Museum

Julie Wolfe; Authors: Andrew Baxter, Katrina Posner, Robert Price, Julie Wolfe

The British artist Henry Moore is well known for his monumental outdoor sculptures, three of which are installed at the Getty Center in Los Angeles as part of the Stark Sculpture Collection. The fourteen-foot-tall sculpture, Bronze Form, was the artist's final outdoor work before his death in 1986. A series of six editions, they were cast and finished at Morris Singer Foundry outside of London starting in 1985. Some of the editions were not completed until after his death, as was the case with the fourth edition of Bronze Form, finished and purchased by the collectors Fran and Ray Stark located in Los Angeles, California in 1987. The Getty acquired Bronze Form (1985, 4/6) as a gift from the Fran and Ray Stark Revocable Trust in 2004-2005, and it has since been prominently displayed surrounded by a reflecting pool adjacent to the Tram Arrival Plaza.

The Museum's conservators have spent over a decade maintaining Bronze Form and planning for its long-term preservation. In 2010, a major treatment was carried out to remove an aged, clear polyurethane coating that was applied before the Getty's acquisition, replacing it with an acrylic lacquer. By 2020, the surface developed uneven corrosion that blemished the translucent, golden patina prompting a more extensive treatment. To remove the corrosion, the treatment involved repolishing the surface and repatinating, which prompted another round of research on Moore's original intent and expectations for the work in an outdoor setting. Even though Moore's artistic process is well documented, the intent of the artist's polished finish for these later works is uncertain and a significant departure from his aesthetic norm. The beginning and end of the project was met with unexpected findings resulting in adaptations to the treatment process. Collaboration and consultation with bronze specialists from Bronze et al, Ltd. and the Henry Moore Foundation helped shape the approach. This paper will review the evidence that supported the conservators' final plan of action to conserve Bronze Form, starting with a description of its original materials and casting method, including comparison with other editions within the series, pre-treatment testing, and will finish with an overview of the final treatment.

Mercury: A Collection Component - A Panel Discussion

Kerith Koss Schrager; Authors: Lisa Goldberg, Kerith Koss Schrager

Mercury, a common component in 18th, 19th, an 20th century collection items, is a well-known hazardous material with potentially severe short and long-term health consequences. Collection items with mercury include a wide variety of natural science specimens (geological, botanical, and taxidermy), pharmaceutical materials, historic pigments, historic mirrors and gilded wood, historic clothing items (felted items such as hats) and scientific instruments. While our understanding of the breadth of mercury use in cultural heritage items is growing, determining actual exposure risks and potential solutions for collections as well as collection care staff and visitors is a current area of research.

This joint session between the Preventive Care Network and the Object Specialty Group will acquaint participants with the range of collection items containing mercury as an intrinsic component, and will help initiate discussions among conservators about hazards, handling, and access. Panelists will present brief case studies to provide examples of risk management, exposure assessments, and handling protocols to control risks associated with these collection items.

90 minute panel of short presentations followed by discussion with the audience. Panelists will cover topics including Toxicology, Industrial Hygiene, Pharmaceutical collections, Taxidermy and mineral collections, Felted garments/ textiles, Mirrors, Gilding, Scientific Instruments.

Paintings

Case studies in Collaboration: 17th century painting workshops to 21st century conservation studios

Nikita Shah; Authors: Herant Khanjian, Joy Mazurek, Catherine Schmidt Patterson, Kari Rayner, Nikita Shah

Collaboration among painters was a defining feature of Flemish painting, particularly among practitioners in 17th century Antwerp. Peter Paul Rubens (1557-1640) and Frans Snijders (1579-1657) periodically worked together, producing artworks of exceptional quality, where their individual contributions were integrated yet distinct. This talk will explore the materials and techniques used in the artistic partnership of Rubens and Snijders, through the case study of a large jointly created painting Larder Still Life with Housekeeper and Young Boy (1636-1638; J. Paul Getty Museum, Los Angeles). In the Getty Larder, the still life was painted by Snijders and his studio while the figures were painted by Rubens' studio. The talk will demonstrate how technical examination can help us understand how these two artists, each with their own distinct styles, combined their strengths to create a unified work of art.

The Getty Larder was studied using a range of imaging and analytical techniques including: X-radiography, multispectral imaging, infrared reflectography, cross-section analysis coupled with scanning electron microscopy, spot X-ray fluorescence (XRF) spectroscopy, scanning macro XRF spectroscopy, FTIR, and chromatographic methods. These methods yielded copious information about the work's stratigraphy and preparation. Combining this analysis with close examination of the paint surface, while referring to a preparatory oil sketch made by Rubens (Kitchen Maid, Butcher and Boy around a Table, KMSKA, Antwerp) and two other related paintings (in private collections) portraying similar yet distinct compositions, a step-by-step development of the Getty Larder could be explicated. The examination revealed that the still life was painted first followed by the figures and suggested that the two collaborators had created an efficient workflow to execute large paintings. The technical study also identified areas of pigment degradation and fading which have caused significant color shifts in the painting.

Even with all this information, unravelling the intricacies of Rubens' and Snijders' partnership presented significant challenges. The scarcity of primary sources documenting collaborative processes, the lack of carbon-based underdrawings, the use of similar pigments and binding media across the picture, and the painting's conservation history made it difficult to separate individual contributions based on material composition alone. Furthermore, characterizing collaboration is complex as Rubens oversaw a large, successful studio with many assistants and students participating in the painting process. Much less is known about other painters working in Antwerp. This talk will present new insights gleaned despite these challenges, providing important context in understanding Rubens' and Snijders' collaborative process.

Undertaking the technical study and treatment of this painting, including removal of degraded natural resin and synthetic varnishes, highlighted how conservation practice in the 21st century is an equally collaborative endeavor. It involves the curator's expertise, the conservation scientist's analysis, and the conservator's knowledge to bridge and synthesize art historical, material, and chemical information. It is only fitting that working with different colleagues has been crucial to generating new insights into the shared working practices of Rubens and Snijders, underscoring the power of collaboration. Artists in 17th century Flemish paintings did not operate in a vacuum and neither do 21st century conservation studios.

"It's the small pieces that make the big picture": The structural treatment of An Allegory of the Tudor Succession

Kristin Holder; Authors: Kristin Holder, M. Alan Miller

The Panel Studio at The Metropolitan Museum of Art and the Yale Center for British Art (YCBA) have been collaborating on the treatment of the YCBA's only painted depiction of the Tudor monarchs—An Allegory of the Tudor Succession (ca. 1590) by an unknown English artist. The painting's large size (four by six

feet) and the complexity of issues in its Baltic oak support required specialized structural treatment that, in the United States, is only currently available at The Met. This paper focuses on the methodology of the structural treatment and what was learned about the painting's original construction and previous restorations.

An Allegory was taken off view in 2022 so that YCBA conservators could examine it using noninvasive techniques including microscopy, X-radiography, ultraviolet and infrared imaging, and x-ray fluorescence (XRF) scanning. The process revealed detailed information about the paint layers as well as the degree to which the painting had been previously restored. Dendrochronology was undertaken on the panel support to answer questions about two boards that had previously been cut across the grain, to the left of the figure of Elizabeth I. The evidence suggested that the tenting paint, lifting fills, and misalignment in the composition were related to issues in the wood support.

The painting was moved to The Metropolitan Museum of Art's Panel Painting Studio in 2023. Previous structural restorations were carefully reversed. This included removal of modern battens glued over the joins—which had caused splits and disjoins in the oak support, removal of thick layers of dark shellac using solvent gels, and separation of the five boards plus the two fragments that had been cut apart previously. Once separated, more than fifteen linear feet of splits were repaired using V-shaped oak wedges, and almost fifty feet of gluing faces were cleaned and prepared for rejoining. Each rejoin required many hours of careful fitting and adjusting to perfect the surface level and create a continuous surface conformation. Once the choreography required to achieve this was perfected, it was practiced numerous times so rejoining could be done in under 20 minutes—the working time for the adhesive. The area where the two boards had to be butt-joined, and four corners leveled, was particularly complicated. On the reverse, where the original wood had been cut away to receive modern battens in the early twentieth century, aged oak was cut to infill these losses and shaped to follow the original tool marks still present. Finally, a custom curved strainer was built to match the original stepped construction on the back, employing spiral spring tensioners to provide tailored support.

This collaboration highlights the complexity of issues when undertaking the treatment of large, thin panel paintings, and current methods of structural conservation, which continue to evolve. The successful treatment of An Allegory of Tudor Succession depended on numerous discussions and in-person visits between Kristin, Jess, and Alan, and the efforts of both institutions' communications teams to document and share the treatment.

Corneille de Lyon heart: technical studies of a late Renaissance portraitist and his workshop in France

Roxane Sperber, Carlandrea Tortorelli; Authors: Sadie Arft, John K. Delaney, Laura Mosteller, Roxane Sperber, Carlandrea Tortorelli

Corneille de Lyon was one of the most prolific painters of 16th-century France, and yet very little is known about his life and oeuvre. Early references called him Corneille de La Haye (from The Hague, Netherlands), but he is documented already settled in Lyon by 1533. There, he established a successful workshop specializing in portraits of the noble, religious and bourgeois classes. As official painter to King Henri II of France (1519-1559), he maintained his workshop until his death in 1573, producing a wide corpus characterized by a naturalistic approach and the small format.

Though it is evident that there is a range of painting styles that falls under the attribution of Corneille, there are no extant signed works by the artist. Only one painting, Pierre Aymeric at the Louvre, has been firmly attributed to the artist thanks to an original inscription, but documentary evidence tells us that at least four people, including his daughter, painted in his workshop. Because of the subtle stylistic differences, it has thus far been impossible to understand which works belong to the painter himself and which belong to his assistants, students, or followers. This veil of mystery further prevents us from understanding the broader cultural context surrounding this artist, his patronage, workshop practice, and how his early life and artistic training in the Netherlands may have influenced French painting more broadly.

In her catalogue raisonné, Anne Dubois de Groër divides the oeuvre into what she calls "dark" and "light" paintings but states that without technical study, it is impossible to discern which artworks belong to each category. Very few technical studies of the artist have been conducted since De Groër's publication in 1997. However, in the last few years, several works by Corneille have been treated and scientifically studied, providing an opportunity to start understanding the artistic process used by this artist and his workshop. This talk will share the early findings from such collaborations by comparing Corneille's technique and materials, across a number of paintings, including the Portrait of a Man from the National Gallery of Art of Washington DC and four portraits from the Indianapolis Museum of Art.

Microscopy, X radiography, Infrared Reflectography, FORS, Infrared Spectroscopy, Reflectance Imaging Spectroscopy, GC-MS, XRF mapping and cross sections are the base for technical discoveries of this subject. The scientific analysis and historical reproduction underpinning this research consider the artworks' materiality and allowed for the comprehensive study that will help art historians to better categorize the numerous portraits in the many collections in US and Europe. The presentation will also frame the painting production by Corneille in a larger artistic environment, related to Jean Clouet (about 1485/90- about 1540/41), Francois Clouet (before 1520 – 1572) and Hans Holbein the Younger (1497/1498 – 1543). This collaborative project addresses the gap in scholarship, defines whether the distinction between master's and assistant's hand is a meaningful metric of quality, and explores how broader workshop production tells a story of equal importance to that of the master.

A Collaboration Between Two Private Practice Firms: The Conservation and Restoration of Noël Hallé's Abraham and the Three Angels

Corrine Long, Gianfranco Pocobene; Authors: Bitzy Couling, Corrine Long, Kelsey Marino, Gianfranco Pocobene, Oliver Watkiss, Travis Zuidema

This paper describes an exceptional collaboration between two private practice firms in the treatment of a large (90" x 104 ½") canvas painting depicting Abraham and the Three Angels (1762) by the French painter, draughtsman and printmaker Noël Hallé (1711-1781). It was brought to Gianfranco Pocobene Studio in need of comprehensive structural treatment, cleaning and restoration. Remarkably, the painting had remained unlined for more than 260 years and was relatively untouched, but the canvas support was very loose, and it suffered from extensive craquelure, severely cupping paint, incipient paint loss and a badly repaired tear caked with a thick, lead white adhesive patch. An oxidized and yellowed varnish layer dulled the image but overall, the paint layers remained largely intact and well preserved.

The unique circumstance of having a large canvas that had remained unlined for more than 260 years initiated much discussion and consideration about the best course of treatment. Could the painting be treated without lining or did its condition in fact warrant a lining to ensure the long-term preservation of the painted image? Ultimately, the need to line the painting proved vital and while other lining methods such as a BEVA adhesive lining were explored, the decision was made to perform a traditional glue-paste lining which, in this case it was decided, would best deal with the paint and canvas problems. This lining technique is rarely if ever executed in North America and so a treatment collaboration was struck between Gianfranco Pocobene Studio and ArtCare Conservation. The success of the lining procedure was made possible through considerable planning between the two firms and most importantly, its execution which was led by Oliver Watkiss, an expert in glue-paste lining techniques.

The design and fabrication of an aluminum Dutch stretcher (loom) to facilitate the lining procedure in collaboration with a local metal worker will also be explored. Furthermore, the project provided two conservation graduate summer interns with the opportunity to learn new techniques and actively participate in a large and complex painting conservation treatment.

Beva 371: past, present, and future

Dean Yoder, Kristin Patterson; Authors: Ali Dhinojwala, Dharamdeep Jain, Christopher McGlinchey, Kristin Patterson, Dean Yoder

The Conserving Canvas Initiative project focused on reformulating BEVA 371 has completed its goal of making a new formulation of Beva 371 with the same

activation properties of the formulation developed by Gustav Berger in the early 1970s. This became necessary because after about 2005 the main tackifier was discontinued, coincidentally around the time of Berger's death, and the formulation containing the substitute tackifier required more heat to properly activate. Berger recommended 65 °C as the activation temperature and noted that it acted as a heat-set adhesive, not a hot melt adhesive. Posthumous formulations after 2005 perform more like hot-melts and require activation temperatures of 70 °C. Through collaboration with the University of Akron (UA) Polymer Science and Engineering department, test formulations were screened and evaluated through a range of end-user testing methodologies common to Paintings Conservators working in museums and in private practice. Peel strength and shear studies were carried out at UA on mockups of paintings on linen and advanced shear testing was carried out at Virginia Tech. The Akron-optimized formulation is phthalate-free and has proven to have heat-set activation properties akin to Berger's formulation. In addition to films and solutions currently available commercially, Akron is investigating solvent-free pellets and non-woven sheets of the formulation. The non-woven consists of monofilament that is pure adhesive cast onto release paper, similar to how the film is currently produced; it does not rely upon a carrier. The benefits of a heat-set adhesive based on the semi-crystalline EVA copolymers used in BEVA 371 and the prospects of the formulation available in both pelletized and non-woven forms are discussed.

Conflict of Interest: This research has been fully funded by the Getty Foundation and the authors have no financial or material interest in CPC or CTS, the producers of BEVA products.

BEVA 371: An examination of morphological properties and the visualization of stress in mock painting samples using advanced thermal, spectroscopic, and imaging methods

Erin Crater; Authors: Jackson Charles, Erin Crater, David Dillard, Christopher Jackson, Christopher McGlinchey, Aidan Miller, Robert Moore, Kristin Patterson, Rafaella De Vita, Dean Yoder

Advanced thermomechanical studies have been carried out on the first formulation BEVA 371 containing Laropal K-80 (discontinued ca. 2005) and formulations recently developed at the University of Akron. Studies are based on neat films of the adhesives and adhered bonds between a mock painting on linen and linen and polyester lining canvases. Creep behavior of old and new formulations using principles of thermomechanical analysis and time-temperature superposition (TTSP) produce master curves allowing for the creep performance of the adhesive to be predicted over longer time periods. Furthermore, by utilizing small/wide-angle X-ray scattering methods and fast-scanning calorimetry, we relate the adhesive's creep performance to the underlying semi-crystalline morphology, which can be fine-tuned based on the thermal treatment of the adhesive during activation. Additionally, creep behavior of mock samples was imaged by (3-dimensional) digital image correlation (DIC) analysis under fixed-load creep testing. Findings provide insight into qualities related to the performance of the adhesive during activation and illustrate concerns of stress concentration relevant to edge-lining treatments but absent in full linings.

Conflict of Interest: This research has been fully funded by the Getty Foundation and the authors have no financial or material interest in CPC or CTS, the producers of BEVA products.

Bringing BEVA 371 into the future: refinements and expanded forms

Ali Dhinojwala; Authors: Ali Dhinojwala, Dharamdeep Jain, Christopher McGlinchey, Kristin Patterson, Dean Yoder

Research was conducted in the School of Polymer Science and Polymer Engineering at the University of Akron to investigate the development of an ethylene vinyl acetate (EVA) adhesive for the lining of paintings. The goal was to make a formulation closer to performance of the original material introduced in the 1970s. Studies found a temperature dependence between the crystalline and amorphous band of the ethylene component of the copolymer in the FTIR spectrum. It was also observed that this trend correlated with tack development. Thus, screening of candidates for replacement tackifier was made more efficient by gathering temperature dependent FTIR spectra of small samples of experimental formulations. The more successful candidates were further screened through mockups prepared by Paintings Conservators and tested in replicates allowing for statistics of bond strength to be included in the findings. The resulting formulation is a phthalate-free formulation utilizing a hydrogenated rosin ester tackifier. In addition to a revised formulation in the traditional solutions, research included calendaring of solvent-free films, experimental testing of aqueous dispersions, the processing of the optimized formulation into pellets and a non-woven cast onto release paper. The final phase of this project consisted of sharing these procedures with the commercial manufacturers of BEVA products to better meet the needs of the cultural heritage community.

Conflict of Interest: *This research has been fully funded by the Getty Foundation and the authors have no financial or material interest in CPC or CTS, the producers of BEVA products.*

Preserving Oversize Paintings: Collaborative Innovations between Paintings Conservation and Collections Management at the Heritage Conservation Centre, Singapore

Filzah Mohd Amir, Irene Dominguez Jimenez; Authors: Filzah Mohd Amir, Irene Dominguez Jimenez

The Heritage Conservation Centre (HCC), Singapore, an institution of the National Heritage Board (NHB) is the centralized storage and conservation facility of Singapore in charge of managing, preserving, documenting, conserving and supporting access to more than 230,000 works of the National Collection of Singapore. Within this collection, oversize paintings, some spanning up to ten meters, have been stored in rolled form due to space constraints at HCC. Anticipating the continued acquisitions of oversize paintings, a senior collections officer's enquiry to the Paintings conservators about reducing the diameter of the rollers to maximise storage capacity, prompted a three-year study on improving the care and storage of large paintings in the National Collection.

Collaboratively, the conservators and senior collections officer surveyed a total of sixty-one rolled paintings encompassing traditional easel works to opera theatre and puppet backdrops on different supports and mediums. Among these paintings are works by renowned Southeast Asian artists such as Semsar Siahaan, Basoeki Abdullah, Maria Taniguchi, and others. The team meticulously documented the whole process of unrolling and rerolling of the paintings, examining and recording details such as the dimension of the rollers, interleaving materials and storage systems.

During the assessment of the paintings' condition, historically known and expected damages resulting from the rolling system proved to be true as the members observed a rhombus-like pattern imprinted on the paintings, undulations and deformations across the paint surface and support on many works. The findings propelled the team to embark on research for solutions to improve the methods and materials used. They explored alternative storage spaces, developed a guideline on rolling paintings and established a protocol on storing newly acquired large paintings. Additionally, they aimed to raise awareness on the adverse effects of permanently storing paintings rolled among the various stakeholders including collections officers, paintings conservators, curators and art handlers. Importantly, this collaborative effort also enables collections officers and conservators to work together to prioritize paintings for stretching and storage, taking into account the available storage space and planning for areas that can accommodate stretched paintings in the future.

Andy Warhol's Oxidation Paintings

Rikke Foulke

Andy Warhol's Oxidation paintings of 1977-78 represent the Pop Artist's exploration of abstraction in the final decade of his life. For an artist deeply invested in a mechanical approach to image making, Warhol paradoxically introduced the intimately human element of urine as the painting medium to the effect of unpredictable colors and patterns. The resultant series of nearly 100 works with irregular forms and sometimes-arabesque abstractions are a distinctive contribution to the art and conservation fields alike as no other paintings containing urine are so widely known. The renowned gold and copper-colored canvases,

with fields of greens, blacks, and browns, belong to institutions and private collections in the States and abroad, but the focus of this research is the oversized 1978 Oxidation (50" x 200", 127 x 508 cm) in The Andy Warhol Museum. The project was facilitated by a temporary HVAC failure at The Warhol during the pandemic summer of 2020 when Oxidation reacted to the fluctuations in the gallery climate. The 45-year-old canvas secreted liquid from within its paint layers, resulting in color changes and new drips in the metal field. The Warhol is uniquely positioned to carry out the study because it is also home to archives of the artist's work, which include scraps cut off from original canvases and numerous painting materials, such as the metallic powders and paints used by the artist in the Oxidation series. Empirical data was collected from the painting as well as mockups, which were made according to the documented techniques of Warhol and his Factory assistants. Scientists in sister institutions and the private sector then identified materials and corrosion products in the original works with x-ray diffraction and SEM/EDS. Subjection of mockups in artificial aging chambers set to parameters akin to those experienced in June of 2020 helped to determine the active role of metallic salts in climate variation. This study confirms the delicate nature of materials in modern collections, especially the non-static behavior of components in the Oxidation series and the importance of reliable climate control systems in facilities that house works of art and cultural heritage. During a time when museums are considering means to reduce their carbon footprint, this study supports a continuation of strict climate standards.

A Mysterious Pair: the treatment and technical study of Veronese's Allegories of Navigation at LACMA

Gerrit Albertson; Authors: Gerrit Albertson, Laura Maccarelli, Yosi Pozeilov

Two large, full-length paintings of male figures, each wearing antique garb amid ruined architectural surroundings, have been art historical mysteries for decades, if not longer. These works on canvas, in the collection of the Los Angeles County Museum of Art (LACMA), were made by the famous Venetian master of the cinquecento Paolo Caliari, otherwise known as Veronese, but it is unclear when exactly the artist made them, for what building, and for what patron. Their subjects, while tentatively described as allegories—Allegory of Navigation with a Cross-Staff and Allegory of Navigation with an Astrolabe—are uncertain, and though they have long been hung together, it is unclear if they were initially part of a larger decorative cycle. LACMA deinstalled much of its permanent collection as it prepares for the grand opening of its new Geffen Galleries, presenting an opportunity to both treat and carry out research on these intriguing paintings.

The paintings were examined closely throughout conservation treatment, which included cleaning, varnishing, and retouching, among other steps. The surface was examined using a stereomicroscope, and high-quality imaging and materials analysis were carried out, including X-radiography, infrared photography, and hand-held XRF. Paint sample cross-sections were examined using PLM and analyzed using SEM-EDX. In addition, a study trip to see related works, two of which have been suggested as being part of a series with LACMA's works, and the Biblioteca Marciana in Saint Mark's Square, Venice, which has been long been cited as the possible original location of the works, complemented the technical study. The results of this research provide valuable insight into Veronese's approach to creating LACMA's works. The authors will discuss these findings in detail, including the use of certain materials that have become altered over time, affecting our current perception of the works. The study's results also provide new clues as to the painting's origins. For instance, research into old paper labels on the paintings' reverse establishes a new link previously unknown in the painting's nineteenth century provenance (including a passing connection to the Statue of Liberty in New York!). They also show that Veronese opted for the relatively inexpensive blue pigment smalt, both for use in the skies and in several draperies, and they show that Veronese made few changes in the composition as he worked. These last two findings differ markedly from the artist's approach in one of the possible pendants, and the authors discuss possible reasons for these differences.

While many questions remain, this study makes a small but significant contribution towards refining our understanding of these works. The authors additionally suggest future steps that could be carried out to solve some of the outstanding mysteries surrounding the paintings' origins.

"I paint paintings": The materials, techniques, and conservation of Joan Mitchell's Paintings on Canvas

Shauna Young, Pamela Johnson; Authors: Annika Finne, Pamela Johnson, Suzanne Siano, Shauna Young

Joan Mitchell (1925–1992), with her bold, intense colors and dynamic compositions, created some of the most lush and painterly surfaces of the 20th century. The question of how Mitchell painted has intrigued viewers, art historians, and conservators since the beginning of her career. Irving Sandler's 1957 profile, which focused on the creation of her painting Bridge, was the first major article to delve into her process. In 1974, Marcia Tucker observed that "Mitchell is an artist whose work is less concerned with ideas or art issues than with the act of painting itself—with the gesture, physicality, and sumptuousness of the pigment she uses." Critics often note her background in figure skating, suggesting that her paintings should be viewed with an awareness of her talent for spinning and gliding. Mitchell is frequently described as a "painter's painter," implying that the tactile experience of brush on canvas is essential to fully understanding and appreciating her work.

Despite the importance of Joan Mitchell's painting techniques to her lasting significance, there has yet to be a dedicated study of her methods and materials. Having examined and/or treated over one hundred of her paintings, the team at Modern Art Conservation has gained significant technical insights. Her work presents various challenges to the conservator, both when writing condition reports that accurately document and describe conditions that may be inherent to and even expected of her materials, as well as when devising effective and appropriate treatment strategies to ensure the longevity of her works. Many of our colleagues have encountered similar challenges, especially in recent years, as major exhibitions such as the Joan Mitchell Retrospective in 2021 and Monet – Mitchell in 2023 have been mounted and as Mitchell's paintings continue to rise in value in the market.

This paper will explore Mitchell's choices of paints, tools, and supports and will examine her working methods throughout her career, situated within the context of the artistic communities and environments in which she lived. It will also address the ways her paintings continue to evolve and the conservation challenges this can present, with the goal of guiding future conservation efforts and ensuring that inherent changes do not distort the ongoing interpretation and appreciation of her work.

Conservator as Project Manager:Lessons I learned and friends I made while moving a Keith Haring Mural

Nina Roth Wells

Construction at Ernest Horn Elementary school in Iowa city necessitated the moving of a little-known mural by Keith Haring. This mural as the result of a long-time friendship between artist Keith Haring and art teacher Colleen Ernst. In 1989 months before his death Haring traveled to Iowa City and completed the mural in the school library in front of crowd of children and teachers.

What appeared to be as simple project, taking a large, framed artwork from a cinder block wall, developed into a complex and costly construction project involving multiple parties. Not only was the mural firmly attached to the wall, but the clients for the project were a city school district and a state university. Neither large organization had the personnel of the bandwidth to devote the necessary attention to detail to manage a project of this scale.

Few conservators have formal training in project management, but the daily problem-solving skills necessary to navigate treating works of art are similarto project management. Flexibility and the nimble approach the conservators bring to the table make them excellent planners. Familiarity with working within the limits of material objects leads to compatibility with construction trades.

This paper will outline how following the protocol of conservation treatments served to organize a multi-faceted project with many challenges and personalities.

Paintings | Wooden Artifacts

Painting on a Ply: Exploring Innovative Treatments and Funding Solutions

Bianca Garcia, Morgan Wylder

In autumn 2022, the Balboa Art Conservation Center (BACC) received a delicate and significant object for examination: a portrait of Jassim Al-Oboudi, a prominent Iraqi actor and professor, painted on a single ply of plywood. This portrait, one of the few items the Jassim family managed to bring with them when fleeing Iraq during Saddam Hussein's Ba'ath Party regime in the 1970s, was in a fragile state with flaking paint and numerous splits in the single ply of wood, held together as a single unit by shipping tape on the verso.

BACC paintings conservators, unfamiliar with treating a painting on a 2 mm ply, sought external advice but faced more questions and treatment options than clear solutions. The necessary research, mock-ups, and professional development needed made treatment prohibitively expensive for the family.

As a nonprofit committed to public benefit and making conservation accessible, BACC, led by Executive Director Leticia Gomez Franco, established a pro bono treatment program for objects of local cultural value that also provided opportunities for skill development for BACC conservators. Given El Cajon's large Iraqi (Chaldean) community– the second-largest outside Iraq, after Detroit–, the portrait was an important piece of local history. Conservators Bianca Garcia and Morgan Wylder embarked on a pilot project to treat the portrait, which involved considerable additional research.

Initial consultations with conservators from various specialties revealed a lack of consensus on how to approach the treatment. Despite many ideas, practical experience with similar objects was limited. Synthesizing all recommendations, the treatment goals focused on finding a practical solution to achieve structural stability and allow the portrait to be displayed in the family's home. Ultimately, the decision was made to return the painting to its original layered construction and back onto a plywood support. With the guidance of furniture conservators, Morgan and Bianca learned techniques generally used to apply decorative veneers back onto wooden supports, adapting them to accommodate the paint layers.

The project was successful on several fronts: the portrait was effectively conserved and returned to the Jassim family, BACC conservators gained new skills from collaborating experts, and the pilot program demonstrated a valuable approach for future projects. This initiative prompted BACC to reconsider its role in community service and affordability. Can we truly serve our community if only those who can afford treatment benefit? Are these issues for only nonprofits to address? While much remains to be explored, the experience has reinforced BACC's commitment to addressing these challenges.

Just Like the Real Thing: Jules Allard et Fils Reproduction Boiserie Period Rooms at the John & Mable Ringling Museum of Art

Brooke Russell; Authors: Laurie Ossman, Barbara A. Ramsay, Brooke Russell, Mary Slater

The 1896 residence of Caroline and John Jacob Astor IV on Fifth Avenue in New York City was designed by architect Richard Morris Hunt and renovated in 1910 by Carrere and Hastings, two of the most prominent architects of America's Gilded Age. The mansion contained reproduction boiserie period rooms produced by the French interior decorating firm Jules Allard et Fils, emulating the tradition of ornately carved and gilded wood paneling of the 17th and 18th centuries in France. Prior to demolition of the Astor residence, two of these rooms—the Cream Salon and Library—were purchased in 1926 by John Ringling and soon after installed as period rooms in the John and Mable Ringling Museum of Art in Sarasota, Florida. In addition to the 1910 renovation, the period rooms had received later alterations and repairs, including overpainting of all painted paneling and much of the gilded ornament.

In 2023, EverGreene Architectural Arts was retained by the museum to elaborate upon earlier investigations, to characterize historic finishes in the rooms and carry out condition assessments and treatment testing. The goal was to better understand the boiserie techniques and develop methods for the appropriate conservation of the wood, gilding, painted finishes, and clear coatings on the wood paneling.

In this study, a more refined understanding of Jules Allard's manufacturing and decorating processes was achieved. In particular, Allard drew upon traditional 17th-century French architectural gilding techniques, while also using more contemporary methods to enhance the depth and dimensionality of gilded surfaces. Visual examination combined with exposure windows and overpaint removal testing, in conjunction with optical microscopy and instrumental analysis, helped to confirm that Allard created desired visual effects by applying sanded boles, juxtaposing oil gilding and water gilding techniques, selectively burnishing the gold, and toning with shellac. In addition to identifying Allard's 19th-century manufacturing methods, including the incorporation of wood veneers, the results of this investigation suggested the use of salvaged elements from authentic boiserie.

Early case studies in the use of Xanthan-Konjac/ Agar physical hydrogels and their analogs for conservation cleaning

Matthew Cushman; Authors: Stéphanie Auffret, Rita Cavalcante, Matthew Cushman, Marie Dubost, Caroline Shaver, Michelle Sullivan, Brianna Weakley

Xanthan-konjac/agar double-network hydrogels, a recent addition to the conservation cleaning toolkit, are thermoreversible, optically clear, cohesive, flexible, conformable, and elastic hydrogels capable of controlled delivery of a broad range of aqueous preparations, some organic solvents, and microemulsions. The development of these hydrogels is described in a separate submission.

Here, a series of case studies illustrate successful applications of these gels for the cleaning of easel paintings, painted surfaces, East Asian export lacquer, gilded surfaces, and works of art on paper, highlighting potential uses and limitations for these versatile formulations. Taken together, we present a model for early dissemination of emergent treatment materials, embracing a feedback loop to refine production and application techniques.

The First Hundred Years of Masonite Northstar

M. Alan Miller

In 1924, while looking into ways to utilize southern yellow pine sawmill waste, William H. Mason invented a process to create a new type of hardboard. Within a year, he established a plant in Laurel, Mississippi, to manufacture his new material. By 1926, Mason applied for, and was awarded, several patents for this new engineered hardboard that would be known as Masonite. Developed at the beginning of the Great Depression, and over the next 100 years, its affordability made it a popular material for use in homes, design, and art. Masonite even found a place in conservation, although later abandoned.

Soon after production began, Masonite was being used by artists. An advertisement for Masonite in the June 1928 issue of Scientific American asked: "Where will this grainless wood be used next?" and "Did you know... that it is in daily service at the Chicago Art Institute as artist's boards?" It was in the paintings of Chicago-based Regionalist painters including Grant Wood and Thomas Hart Benton that we first find Masonite being widely used. It could be said that the rise of Masonite parallels the rise of American Regionalism and Social or Urban Realism painting in the 1930s, movements that represented a direct reaction against European Modernist painting. Rejecting not only traditional European subject matter but also traditional painting materials, Masonite was both affordable and readily available.

However, American painters were not the only artists who reached for Masonite in their attempt to upend the traditional hierarchy of painting materials and subject matter. The Catalan painter, Joan Miro, famously used Masonite in a series of 27 paintings in his attempt to do just that –to "assassinate painting" -between the years of 1927 and 1937 By 1940, in order to ramp up hardboard

production, Masonite had licensed manufacturing facilities in Australia, Canada, Italy and Sweden. Its use as a painting support quickly spread across the globe.

Scholars of art materials and techniques, including Ralph Mayer and Frederic Taubes, have written about the use of Masonite in making art. The changes in their advice over subsequent editions reveal a changing understanding of the pros and cons of Masonite's properties. Sorting out the history and details of Masonite production and how this has changed over time as well as the history of its use will help us more accurately understand the role of Masonite as an art material and why, at times, problems arise in its use.

Though Masonite is a ubiquitous art material, it remains understudied and many aspects of its composition, manufacture, and use by artists remain to be explored. For example, Masonite appears to exist between the realm of paper and wood panels: how do its properties compare to these materials? Can we identify where a board of Masonite was produced? And how does Masonite production affect what was painted on it and our treatment options?

Collaborative conservation of a monumental altarpiece: Vivarini's Virgin and Dead Christ with the Ascension and Saints

Abigail Hykin, Erin Mysak; Authors: Monica Berry, Judy Dion, Andrew Haines, Pamela Hatchfield, Abigail Hykin, Erin Mysak, Gregory Porter, Lydia Vagts

Bartolomeo Vivarini's 1485 monumental altarpiece Virgin and the Dead Christ with the Ascension and Saints consists of a central polychrome sculpture surrounded by nine panel paintings all enclosed in the original ornate gilded frame. It is signed on the base of the Pietà: FACTVM VENETIIS PER BARTOLOMEVM VIVARINVM DE MVRIANO PINXIT 1485 ("Made in Venice by Bartolomeo Vivarini of Murano he painted it 1485"). Though the altarpiece was dismantled when it was removed from its original location in current-day Croatia in 1876, it is believed to be a completely intact work. The work has been in the collection of the Museum of Fine Arts, Boston (MFA) since 1901, with the various elements receiving different degrees of treatment over the past century. As a result of this uneven treatment history, the altarpiece has never read as a unified work of art.

A major collaborative conservation treatment, supported by technical and scientific research, was carried out between 2018-2024 with the aim of finally bringing all the elements of the altarpiece into a cohesive whole. This presentation explores the ways in which distinct conservation specialties approached the treatment working in tandem with our research scientists and curators.

Each element of the altarpiece was documented and examined thoroughly using techniques such as X-radiography, UV fluorescence, and infrared reflectography. The structure of the Pietà was investigated with CT-scanning at Massachusetts General Hospital. The materials (pigments, varnishes, gilding) were analyzed to better understand their composition and determine if the same materials were used consistently throughout, using methods including optical microscopy, Fourier-transform infrared spectroscopy, X-ray fluorescence, Raman spectroscopy, scanning electron microscopy, and energy dispersive X-ray spectroscopy.

Structural work was carried out on all the elements to stabilize splitting or cracking of the wooden substrates and strengthen areas of insect damage. Some of the panels were sent to the Metropolitan Museum of Art Paintings Conservation Studio for more specialized treatment.

Treatment was carried out simultaneously in the Paintings, Objects, and Frame Conservation studios, all of which are now in proximity, along with the Conservation Science department, in the MFA's newly renovated Conservation Center. At several points in the treatment process the various parts of the altarpiece were brought together and reviewed with the entire team, including curatorial colleagues, to make sure that the levels of first cleaning and then compensation remained consistent. As treatment progressed, previously unnoticed or obscured details shared by the different pieces emerged, highlighting the complementary relationship among painting, sculpture, and frame. These visual cues were bolstered by the results of scientific analysis, which more firmly tied the works together.

This project, completed in the spring of this year (2024), was an exciting opportunity for many of the divisions of the Conservation Department to collaborate on treatment and analysis. It led to fruitful exchanges of methods and different uses of materials and has built a framework for more collaborative treatment projects in the future.

X-ray Dendro: DIY CT Tree Ring Measurement for Dating Wooden Panels

Francien Bossema, Arlen Heginbotham; Authors: Francien Bossema, Marta Domínguez-Delmás, Arlen Heginbotham, Andrea Seim

Dendrochronology is a method of dating the age of wood, based on the measurement of tree ring widths followed by statistical comparison with master chronologies. Dendrochronology is used widely in the study and authentication of artworks, particularly furniture, panel paintings, and sculptures. In traditional dendrochronology this involves destructive surface preparation, macro photography, and manual ring counting. On painted surfaces or inlaid panels however, the tree rings are often not accessible to retrieve this information. X-ray imaging has therefore been used with success to obtain virtual cross-sections of objects without invasive methods. A proven method is CT scanning, which provides a three-dimensional image of the object, which can be virtually 'sliced' to obtain images of the tree rings. Recently, fast digital radiography detectors with high resolution have become available that can be combined with commercially available digital turntables to rapidly generate large numbers of radiographs of a single object at fixed angular increments. With these, it is now possible to generate full X-ray tomographic reconstructions (CT scans) using equipment available in many museum radiography laboratories. This eliminates the need for dedicated CT equipment or the transport of artworks to specialized facilities.

Large flat panels of wood, such as those used in furniture and panel paintings, pose difficult problems for conventional tomography because it can be difficult or impossible to rotate the entire panel within the field of view, and because the thickness of wood presented to the X-ray beam varies so dramatically as it is rotated.

In this presentation, we will present a solution to the challenge of large panels by obtaining X-ray images in a limited angular range. The resulting tomographic reconstruction has lower resolution in depth, but tree rings are still clearly resolved. The creation of a full 3D reconstruction means that obscuring elements such as marquetry, paint, and cradles can be virtually stripped away. We take an extra step by then using imaging processing methods to automatically measure the tree rings along the full 3D volume, thus averaging thousands of measurements and yielding precise and robust measurements. This method was developed using only the in-house X-ray imaging equipment of the J. Paul Getty Museum – which consists of a digital detector and a simple computer-controlled turntable. We demonstrate the method and prove that it works on test planks first. The obtained measurements are compared to traditional measurements made by three dendrochronologists. We then continue to apply the method on a case study object from the J. Paul Getty Museum. This method should allow many more artworks and architectural elements to be dated by dendrochronology than ever before.

We combine the expertise of dendrochronologists, conservators, X-ray scientists and computer scientists in a highly interdisciplinary project. The project is a collaboration between the J. Paul Getty Museum (Los Angeles) and the Center for Mathematics and Computer Science (Amsterdam).

Collaboration past and present: the collective investigation and treatment of the Saint John the Baptist altarpiece from the workshop of Blasco de Grañén

Molly Hughes-Hallett; Authors: Matthew Hayes, Molly Hughes-Hallett, Alexa Klein, Clare Misko, Dianne Modestini, Kyle Norris

The recent conservation treatment of a fifteenth-century Spanish altarpiece at the Conservation Center of the Institute of Fine Arts, New York University provided an opportunity to explore aspects of collaboration past and present. In this talk we will share recent research on the materials, techniques, and workshop practices of the Saint John the Baptist altarpiece (ca. 1415-20), a fragmentarily preserved retable attributed to the Aragonese painter Blasco de Grañén and now in the collection of the San Diego Museum of Art. The surviving panels of what was once a larger structure include a monumental central depiction of John the Baptist flanked by four scenes from the saint's life. The treatment of the painting presented the opportunity for its examination, which was carried out using an array of techniques including binocular microscopy, x-ray fluorescence spectrometry (XRF), infrared reflectography, x-radiography, cross-sections, scanning electron microscopy (SEM-EDX), and Raman spectroscopy. Physical and stylistic aspects suggested aspects of cooperation within the Zaragosa workshop and offered information on the retable's original construction and its conservation history. Salient features of the painting's facture include its freely incised preparatory drawing and its innovative use of metal leaf in the rendering of textiles. It shows both similarities and differences with contemporary art in Spain and Italy. Through this research, we contribute to the still-understudied field of fifteenth-century Spanish and especially Aragonese painting; though a few publications have appeared recently, there is little information on the methods of many important workshops, nor on the commonalities and variations in the period's artistic practice.

The treatment and technical study of the five panels was carried out within the Kress Program in Paintings Conservation at the Conservation Center by four students and one instructor and under the guidance of additional colleagues. The project provided an opportunity to work together as a group to examine and treat a large composite object; to coordinate, in both cleaning and retouching, the unified presentation of an array of panels in different conditions; and to collaborate in scientific investigation and writing. The talk will hence also reflect upon that experience within an educational context. It will sketch the division of research by subject and summarize the discussions and challenges that arose through the processes of restoration and scholarship. The desideratum of collaboration brought a heightened awareness of the painting's original materials and our own conservation methods, as this fragmentary object presented many variations in condition and even in response to the same treatment steps. With its numerous, coordinated moving parts and apprenticeship-like structure, this project created a kind of modern analogue to the traditional workshop in which the retable was made.

Photographic Materials

Application of High-Resolution Multispectral Imaging Systems for the Very-Long-Term Monitoring of Degradation Over Time of Photographs, Paintings, Fabrics, Documents, Books, and Other Cultural Heritage Materials

Henry Wilhelm; Authors: Ken Boydston, Henry Wilhelm, Joe Uziel, Shai Halevei

High-resolution multispectral imaging provides periodic full-image area, non-destructive and zero-contactmonitoring over both short and very long periods of time of cultural heritage materials, including photographs, paintings, fabrics, documents, books, tapestries, and other works of artistic and historicimportance with very large data sets consisting of up to ten thousand or more discrete colorimetric data pointsfor the short-term and long-term monitoring of full-tonal-scale – generally nonlinear – colorimetric changes (including in the UV and IR regions), in a fully time-integrated manner, that may take place over time in thefull image area and in the support material (front and back). Multispectral imaging can accurately monitor rates of degradation of optical brightening agents (OBAs) and can quantify gradual yellowish or other stain formation in photographs, including albumen prints, polyethylene coated (RC) papers, and other materials.

Multispectral imaging provides the ability to monitor glazed works periodically during exhibition without the necessity of removing glass or plastic sheets from their frames while the works remain on the wall. Likewise, works housed in anoxic frames may be monitored over the long term without opening the frames. Irregularities in image deterioration and/or staining brought about by localized variations with photographic materials and their chemical processing, washing, contamination during drying, or as a result of selenium, sepia, gold, or other chemical toning treatments, coating and varnish layers, laminates, and other steps employed in the creation and finishing of the work, integrated with the inevitably non-uniform contact with mounting, framing, and storage materials over time, and the effects of exposure to non-uniform lighting, environmental and "micro-climate" temperature and relative humidity conditions, can be assessed and compared over long periods of time in all areas of an image – including within very small image details.

Representative times currently required for a MegaVision camera-based high-resolution capture of an object are:

1 minute and 16 seconds for 16 sequential image captures with 16 different waveband illuminants (with no filter wheel captures), with an integrated lux exposure of 0.12 lux/hour (equivalent to <10 seconds of display at 50 lux), and 3 minutes and 15 seconds for 26 sequential image captures with 26 different waveband illuminants (capture time includes 10 filter wheel captures for a more comprehensive OBA degradation analysis), with an integrated lux exposure of 0.33 lux hour (equivalent to <1 minute of display at 50 lux). High-resolution multispectral camera captures provide extremely accurate color images that are superior to RGB captures. These images can be used to automatically generate lower-resolution RGB images for cataloging, websites, publications, posters, and other uses. These high-resolution images can also readily be used to make color-accurate facsimile prints for exhibitions and study. Multispectral imaging employed as a routine part of the acquisition and accessioning process provides a "time-zero" set of high-resolution spectral data for every object that can then be used for very-long-term monitoring.

This presentation will consider the formidable technical challenges of very-long-term monitoring in the context of the now more than 2,000-year-old Dead Sea Scrolls in Israel, and the ongoing programs to systematically multispectrally capture each scroll and scroll fragment, monitor, and preserve the delicateparchment scrolls and scroll fragments. During the coming hundreds or many thousands of years into the future, every single part of a multispectral imaging system and the associated computers, software and data storage systems, calibration targets – and our understanding of color science itself – will repeatedly become obsolete and must be replaced with new systems. Strategies thatwill ensure a continued high degree of accuracy relative to the original measurements are proposed.

Without a comprehensive multispectral monitoring program, conservators and other institutional caretakers will have little or no quantitative data concerning what has actually been happening to their collections as they age over time, and with the understanding that comes with that quantitative information, of how degradation may be slowed or halted by changes in display and loan policies, by the use of humidity-controlled refrigerated and sub-zero freezer preservation, and by other means, some of which are yet to be developed.

"Lights on Vivex prints!" Raman identification and microfade testing of coloring materials

Loys Boivin, Céline Daher; Authors: Loys Boivin, Céline Daher, Jean-Paul Gandolfo, Bruno Le Namouric, Gaël Quintric, Chloé Ranchoux

Vivex prints were initiated in 1928 by Color Photographs Limited (CPL, London) as a modified version of Carbro printing that was the dominant process in the 1930s for advertising and retail fashion. Vivex prints were produced in an industrial manner, using a standardized, mechanized protocol. It was the first laboratory to offer a color printing service to professional photographers. Fully operational in 1929, CPL produced several thousand prints in a ten years laps time, becoming the most widely used and reliable printing service in the UK. Despite being a cost-efficient company, CPL closed in 1939, with the beginning of World War II.

The Vivex process uses three separation negatives created during shooting, using a one-shot camera or a Vivex repeating back. The process produces – in 80 steps – a pigmentary trichromatic print from the successive transfers of three primary images (yellow, magenta, cyan) inscribed in a pigmented gelatin relief. The colored carbon tissues used by CPL for printing were likely purchased from Autotype Company, based in London as well.

Five Vivex color photographs by Egidio Scaioni, created between 1933 and 1939 and held at the Musée de la Mode de la Ville de Paris, Palais Galliera, were studied. The conservation state of these prints, and an advanced conservation project - as part of Loys Boivin's Master thesis at Institut National du Patrimoine - have triggered the need for analyses to better understand the materiality of these little-known objects.

Fortunately, all five prints showed accessible margins for each colored layer. Thus, non-invasive XRF analyses were carried out in these areas to identify the pigments used. The cyan layer showed the presence of iron, evidence of the use of Prussian blue. Surprisingly, the yellow and magenta layers did not show any elements related to the presence of pigments. Samples were taken from lacunar areas in the margins of one print for additional investigations using Raman spectroscopy. The yellow sample showed a signal specific to Pigment Yellow 4 of the Color Index (C.I. 11665) or Hansa Yellow. The magenta sample showed an intense signal with multiple bands – likely an organic pigment – but has not yet been attributed due to the lack of published databases.

The discovery of the synthetic organic nature of these pigments instead of the mineral pigments traditionally used for historical pigment prints raised doubts about the light-fastness of these objects. Microfading tests were performed on the colored margins of three prints: all layers are highly sensitive, despite a slightly more stable yellow layer.

The industrial context of manufacturing might have guided the choice of new components, with the great color rendering required for the fleeting advertising and fashion fields, but less durable in time. These strategic choices are most likely part of a global context of industrial development, with massive production demand and high profitability. This study opens up new insights into the light sensitivity of pigment color prints, and the development of new approaches to exhibiting these rare historical prints.

The Wayside: House of Authors in Concord, MA, Introduction to Conservation and Preservation Efforts for Framed Photographs on Display

Karina Beeman

The Wayside, a historic home in Concord, Massachusetts, is renowned for being the residence of several prominent 19th-century authors, including Louisa May Alcott, Nathaniel Hawthorne, and Margaret Sidney (Harriet Lothrop). In 1965, the house became part of Minute Man National Historical Park, marking the first literary site acquired by the National Park Service.

This presentation will focus on the ongoing efforts to preserve and conserve the collection of photographs permanently displayed in the house.

The walls of The Wayside are adorned with artwork, documents, and family photographs, many of which have been on display since their original placement by the owners. In 2023, a project was launched to address the conservation of framed paper artifacts on display. A team of paper and photograph conservator, along with object conservators, working through CCI Industrial Services, LLC, was contracted by the National Park Service for this task. The conservation work took place at the Historic Architecture, Conservation, and Engineering Center in Lowell, MA.

This presentation will delve into the decision-making processes behind the conservation efforts, considering the unique qualities of the artwork, its contextual significance, and the specific requirements of preserving it within a historic house setting. The collaborative efforts between conservators, curators, and National Park Service Project Inspectors will be a key focus.

The aim of the talk is to introduce the collection and highlight the factors specific to The Wayside that influenced the conservation approach. The presentation will be accompanied by images of the house and examples of the treatments undertaken.

Handcrafted Preservation: Custom Storage Solutions for Photographs at the Archivo de la Memoria Trans Argentina

Carolina Nastri; Authors: Carolina Figueredo, Carolina Nastri, Ornella Vega

This presentation will discuss the work conducted at the Archivo de la Memoria Trans Argentina (AMT) regarding the design and creation of custom storage systems for photographic materials.

A unique aspect of the AMT is its management and operation by the trans community. Individuals over 50 years old, trained from the ground up, work with their own materials, handling both the digitization and conservation of the archive's photographs and documents. This approach ensures that the preservation process is deeply connected to and reflective of the community.

The AMT preserves a diverse range of photographic formats and materials, including silver gelatin prints (DOP), chromogenic prints, dye diffusion transfers, and negatives and slides on flexible plastic supports like triacetate and polyester.

Given the challenges of obtaining conservation supplies in Argentina, we have developed bespoke storage systems tailored to the specific needs of our collection. These systems are carefully designed to address the preservation requirements of our photographs and documents.

Before developing these storage systems, we ensured that the collection was properly organized, conservation conditions were assessed, photographic processes were identified, and an appropriate storage environment was established. The primary purpose of our storage design is to act as a physical barrier against environmental contaminants, fluctuations in relative humidity (RH) and temperature, particle deposition, abrasion, and improper handling.

Since our archive does not yet have permanent environmental controls, we decided to create multiple levels of storage and avoid using adhesives or plastics. Instead, all storage systems are crafted from cellulose-based materials that meet the following criteria: smooth and soft surface, dimensional stability, flexibility, white with no dyes or pigments that could migrate, long-term durability and performance, acid-free, free of peroxides and sulfur compounds, lignin-free, and devoid of plasticizers, resins, or waxes.

Locally available materials meeting archival permanence standards were selected for our storage systems. In Argentina, medical-grade paper is commonly used for photographic materials due to its technical specifications, which confirm its suitability for archival preservation.

The design of our storage systems was informed by the working methodology

and the way materials are accessed and consulted. Consequently, we have developed paper envelope models, machine-sewn without adhesives, and designed folded models for folders and boxes to house individual items and photo albums. To standardize our processes and train new team members, we have created instructional documents and templates for the production of these storage systems.

Additionally, we have been monitoring internal and external environmental conditions using a data logger to assess how these multiple layers of storage serve as buffers against external environmental fluctuations. This presentation will include preliminary results from this ongoing monitoring, providing insights into the effectiveness of our storage solutions in mitigating environmental impacts.

Conservation of the portrait of Leonardas Biržiška (1809–1902)

Elvina Karosienė

The Biržiškos are meritorious Samogitian nobility family in Lithuania. Their history dates back to the 16th century in Karšuva patrimony. Mr. Leonardas son Mykolas (b. 1882) was one of the twenty of February 16th Act Signatories, a researcher of Lithuanian literature and folklore, the Rector, academic and professor of Vytautas Magnus University and Vilnius University.

Vaclovas Biržiška (b. 1884) was a Lithuanian cultural scientist, the director of the libraries at Vytautas Magnus University and Vilnius University, the Dean of the Faculty of Law, academic and professor.

Viktoras Biržiška (b. 1886) was one of the creators of the Lithuanian Armed Forces, mathematician, the head and professor of the Department of Mathematical Analysis of Vytautas Magnus University and Vilnius University.

The reverse side of the Mr. Leonardas photograph is glued on thick cardboard. The surface side is framed with a hard greenish cardboard mat. The surfaces are very dirty, deformed, unevenly yellowing, spotted with insect excrement and spots of unclear origin, and dappled with spots that occurred from flowing fluid. Some parts at the corners and edges are missing, there are flaws and the paper is layered.

Silver gloss is visible on the surface of the photograph, and the features of the person in the photograph are highlighted with black lines. On the left of the upper part there is a slight flaw on the surface.

The acidity of the paper was measured by a universal indicator. Acidity of the mat is pH ≈ 6. The acidity of the cardboard to which the photograph is glued is pH = 6-7.

After researching a paper fibre with a 2% aqueous sulfanilamide solution, it was found that the paper of the mat contains lignin, and there is no lignin in the cardboard on which the photograph is glued.

After visually evaluating the condition it was decided to restore the exhibit undismantled. In order to keep the restoration work safe, the order, techniques and materials to glue the flaws and restore the missing parts were considered with great responsibility. The surfaces of the exhibit were cleaned mechanically with wool, erasers of different hardness, and their shaves. The surface layer with insect excrement was removed with a scalpel.

The flaws and missing parts were restored in dry method by gluing the layers of restoration paper to achieve the thickness of the original cardboard. Cotton pulp paper and watercolour-toned Japanese Kizuki Kozo paper were used for restoration. It was glued with a mixture of corn starch plaster, Tylose MH300 and MH1000 aqueous solutions.

The restored parts of the surface of the mat have been retouched with watercolour and pastel, using the technique of dotting. Using a white watercolour pencil, the decorative strip of the mat and its inner edges were retouched as well as a sharp line of brown flowing fluid was split.

Developing Conservator: My Journey in Darkroom Photography

Sophie Church; Authors: Sophie Church, Theresa J. Smith

In the field of art conservation, understanding of an artist's chosen materials and their creative application is fundamental. This holds true for photograph conservation, where a profound grasp of the historic evolution and chemistry of photographic processes is crucial for discerning and identifying each technique. However, deeper learning is achieved through hands-on engagement in the darkroom. Delving into the intricacies of photographic processes not only unveils the technology, tools, and chemistry underpinning their production but also serves as an invaluable experiential learning tool. Darkroom practice enables observation and critical thinking about a photograph's evolution from its initial creation to potential display, and how these factors influence its long-term preservation. It also facilitates an understanding of the differences between genuine deterioration and intentional alterations made by a photographer. Creating photographs in the darkroom can combine research into the history and chemistry of photography with research into photographers, studios, and businesses utilizing these techniques today. The sensitivities of different emulsions can also be experimented with and observed. The addition of toners or other chemical baths in the darkroom can be understood by seeing the change in color of a print and its stability over time. This immersive exploration equips conservators with a dynamic perspective that informs their decision-making in the outreach, preservation, and treatment of photographic materials. When creating albumen prints for example, the paper curls at all stages of production from the first application of the egg-salt mixture to the final wash bath. This demonstrates the inherent qualities of these prints and though we may consider curling damaging and work to keep the print flat, it is also an unavoidable part of the making process. While striving to maintain flatness, historically, albumen prints would be mounted to a paper board. This mounting process, though keeping the print from curling, could potentially introduce cracking in the emulsion over time. The tendency of the print to curl and potential cycles of curling and flattening demonstrate its sensitivity to moisture and the need for a stable environment and safe housing for long term preservation. Additionally, through making albumen prints, the similarities to the salted paper print process are clearly identifiable. The recipes for chemical baths and steps in the darkroom are nearly equivalent. It is understandable why their identification might be challenging. Finally, the darkroom also serves as a platform for outreach, where sharing the art and science of photography through workshops and social media can enhance public understanding and appreciation of art conservation. This is increasingly important in an era when images are so easily captured, duplicated, and distributed.

De "mist"ifying the Dahlia Sprayer

Seth Irwin

For decades the Dahlia Sprayer has become one of the most used pieces of equipment in the paper conservation lab. The Dahlia Sprayer is a trusted tool for treatment work, such as washing, humidifying, and other applications. Being constructed from chrome plated brass, the sprayer is also known for its durability and reliability. A conservator may run thousands of gallons of liquid through a heavily used Dahlia Sprayer over the course of the sprayer's life. But as ubiquitous as the Dahlia Sprayer is in our work, it also has drawbacks and problems. After years of consistent use, this expensive sprayer can stop working or fail to operate at optimal performance. This can happen for many reasons, from hard water buildup to degraded O-rings, resulting in leaking, poor misting, or malfunctioning. Fortunately, many of these issues can be addressed and aren't difficult to fix. Parts are easily available, and maintenance isn't complicated. This short tip talk will discuss the most common maintenance challenges with the Dahlia Sprayer, how to prevent these issues from happening and how to repair the Dahlia Sprayer when they do occur.

Preventive Care

Meeting in the Middle: Best Practices and Practical Actions Unite in Community Collaboration

Katie Risseeuw

Small cultural heritage institutions like community-based archives and museums rarely have preservation expertise. Best preservation and archival practices may not be their main focus – keeping and telling their story is. An outreach event, Preservation in Action, collaborates with organizations like this to implement aspects of collections care while balancing their community-centered mission. Organized through the long active Preservation Section of the American Library Association (ALA), the day-long outreach event takes place at the annual ALA conference. Preservation in Action (PiA) has a 3-prong approach to working with organizations representing an underserved community: 1) provide preservation training to staff; 2) introduce preservation to conference attendees whose jobs may or may not involve collections care; 3) rehouse collections with a "many hands make light work" model. PiA is specifically not a "service project," but a collaboration between trained preservation librarians and these institutions that lack expertise. The training and hands-on activities with participants who have different levels of experience can be unpredictable but always enriching

A grant-funded archiving initiative at a Puerto Rican Cultural Center has led to a growing collection of posters documenting decades of social justice activism in the Boricua community. The colorful screenprinted posters fit into oversize folders and boxes, except for a group that had been glued to cardboard. The situation required on-the-spot decisions and conversations with the staff. In this case, the archivist decided to leave the newsprint posters on the acidic board and order more archival boxes later. We relied on each other to offer solutions

At a Chinese History Museum, we found extensively embroidered and beaded textiles during the group rehousing project. I wanted to bulk up any harsh creases, but the collections manager was concerned about losing box space with just one dress. Through joint problem-solving, we found a middle ground to protect the textile without taking up too much room

Other times our progress fades. At an organization with changing staff and strategic visions, the housing of photos and re-sleeving of a famous DJ's LPs was later changed or undone. The artifacts' uses evolved

Over the past several years, I've learned lessons about organizing these events at archives and museums. A stable infrastructure is necessary. Logistics like monitoring a waiting list, delivery of supplies, and ordering lunch are time consuming. Having a local committee member is best to evaluate the collections and estimate supplies. A participant will always ask a wonderfully unanswerable question. While institutions learn from us, we also learn from them. Our strict best practices aren't an option for many organizations. This provides us with an opportunity to be flexible, think creatively, and listen to those outside our profession.

Van Gogh in motion: Safeguarding lined and unlined Van Gogh paintings from vibration and mechanical shock during transport

Kerstin Kracht; Authors: Kerstin Kracht, Saskia van Oudheusden

In 2023 a major exhibition about Vincent van Gogh (1853-1890) in Auvers was held at the Van Gogh Museum in Amsterdam in collaboration with the Musée d'Orsay in Paris, the second venue for this show. A significant exhibition since it was the first to be devoted to Van Gogh's final months, bringing together works from all over the world, some of which had never before been shown at the same time. The question arose if several works of the Van Gogh Museum, which due to their fragility were not allowed to travel, could be transferred to Paris for this unique occasion. There were serious concerns about the impact of shock and vibrations during transport on two paintings in particular, Wheatfield with Crows and Wheatfield under Thunderclouds, which suffered from heavily cracked paint layers and poor paint adherence. When the strain levels caused by transport exceed the elasticity limits of the canvas and paint layers, they can inflict or aggravate material changes such as cracking and delamination (Kracht 2011: 51-53), thus posing a great risk for those paintings. Reducing the excitation levels is therefore crucial.

This research, which builds strongly on the experience gained from an in-depth study of the vibration behavior of selected Van Gogh paintings in the Kröller-Müller Museum, Otterlo (Bisschoff et al. 2023), explores the vibration behavior of the wax-resin lined Wheatfield with Crows and Wheatfield under Thunderclouds. The panoramic, atypical format of these paintings (ca 50 x 100 cm height by width), which differs from the paintings studied in the Kröller-Müller Museum, and the permanent deformations in their support caused by lining are factors that contribute to their fragility. To establish the general difference in vibration behaviour between wax-resin lined, loose-lined and unlined Van Gogh paintings, the vibration response of View on Auvers, which has a loose-lining, and Garden of Daubigny, an unlined painting, was also investigated. The mechanical behavior of the paintings is explained in relation to their condition, conservation history and framing, the combination of which accounts for the paintings' variable, non-linear vibration behavior. To achieve a more complete assessment of the transportation risk, not only the characteristic vibration modes of the paintings were investigated, as was done in the Kröller-Müller study, but their wave propagation behavior was examined as well.

By combining an improved backing-board and framing construction with specific transport conditions, the mechanical stress in the two Van Gogh paintings could be significantly reduced during transport. A tailored method for transporting these fragile paintings is presented, while the possibility of its application to other paintings of the Van Gogh Museum collection is also discussed. In this research an ansatz is proposed to quantitatively assess the risk of vibration during transport. However, the results of this study should not be regarded as a formula or justification for sending paintings on loan that are too fragile to travel. Yet the presented measures of improvement can certainly be considered as a means to minimize the impact of shock and vibration when transport cannot be avoided.

A Multi-Strategy Approach to Preventive Conservation for historic wooden objects

Amanda Hahn, Hebe Halstead; Authors: Amanda Hahn, Hebe Halstead, Antanas Melinis, David Thickett

The historic wooden columns currently on open display in the Victoria and Albert Museum (V&A) have been consistently shedding wood flakes throughout 2024. This ongoing deterioration has prompted the application of a targeted, multi-faceted strategy to identify the causes and mitigations made to combat them. For this organic material, the most likely potential agents of deterioration were identified as relative humidity fluctuations, pest activity, and physical force. To gain the clearest image of how and if these agents were impacting this object and a three pronged approach has been implemented.

The first prong of this strategy is analysing the existing data from the object environment, including environmental data and visitor number estimates. This will help identify trends in fluctuation of humidity, periods of increased physical force due to high footfall, and potential patterns in the degradation process.

The second prong employs Acoustic Emission (AE) analysis to monitor internal movement of the wooden columns and determine if movement is caused by humidity changes, pest activity, and external vibrations from urban traffic and gallery visitors. This analysis is combined with the innovative use of touch sensor alarms to alert when the columns are physically contacted by visitors, an area of concern that was raised during planning. The third prong uses Dynamic Vapour Sorption (DVS) analysis, conducted in partnership with English Heritage, to assess the structural integrity of the wood and its vulnerability to humidity variations.

There are multiple instances where these analyses are looking at the same agent of deterioration, for example all tests included consider humidity as a factor. This is not a redundancy in design, but an opportunity to consider factors that cause deterioration as a dynamic and interconnected system - rather than a roster of lone agents. This work aims to inform display strategy for similar heritage objects and to highlight the need for adaptive and interdisciplinary methodologies in preventive conservation.

Heat protective covers: Enhancing Fire Preparedness for Cultural Collections and the case study of Emergency Planning in France

Gregoire Bernand

Fire risks pose a significant threat to cultural institutions' collections. Hundreds of fires start every year in museums. Recent examples include the National Museum of Indonesia, Copenhagen's Historic Stock Exchange, Brazil National Museum…

Some destroy entire collections, others cause irreparable damage, and most could be controlled or prevented. To improve preparedness and mitigate damage, a comprehensive Emergency Plan should be adopted with a complete operations plan that outline procedures for responding to fires. Collaborate with experts and conduct regular self-assessments to identify and minimize risks.

In case of fire, damage is caused not only by the heat of the flames but also water and smoke. After the Notre-Dame Cathedral fire, the French National Association of Firefighters requested to conduct a study on protective tools for artwork, notably passive protective covers.

Aside from this study conducted by the CSTB (Centre Scientifique et Technique du Bâtiment), a series of other experiments were made, including one from a Danish Cultural Institution and Fire Department.

Those experiments are not limited to testing different materials and technologies (Tyvek, Aramid fibers, PU or Silicone coated fiberglass, aluminized fiberglass…), in laboratories, but also simulate real fire scenarios.

Results from those experiments show that priority should be given to using passive protective covers with an aluminized material over traditional fire-retardant materials. These lightweight covers reflect up to 99% of radiant heat away from artwork, providing superior protection. During fire exercise, those covers have been shown to allow the artwork to stay below 40°C – 104°F and thus providing maximum protection in an environment that can reach more than 500°C – 932°F.

By implementing these strategies, cultural institutions can mitigate fire risks and preserve valuable artifacts with minimum investment required in terms of infrastructure. Additional measures, especially operational aspect and ease of handling are key at the time of using this material in an emergency, making passive covers a practical solution for cultural institutions.

Proper training and involving all implied parties are required to optimize use of covers during an emergency and should be done on a regular basis in institutions.

For the last six years, fire preparedness in France has been growing. Parties like the Government, the Ministry of Culture, Industry Associations, Cultural Institutions, Fire Departments, Specialist Consultants… have been raising awareness on the importance of this topic and implementing measures and tools to maximize chances to safeguard cultural heritage. This led France to being one of the most advanced countries on the topic.

This session deep dives in the way Emergency Response in case of fire is approached in France, going through what Emergency Plans consist in, how are they constructed, the way they are implemented and how do cultural institutions make sure they get as ready as possible in case an emergency occurs to avoid and minimize damages on artwork.

Turning Leaks into Lessons: Insights from a Water Leak Response in University Special Collections

Elise Etrheim, Fleur van der Woude

In August 2024, University of Arizona Libraries' Special Collections faced a water leak that damaged book and archival collections across two floors. The decision was made to close Special Collections for two weeks, allowing the department to focus on the remediation of damaged materials and spaces. Thanks to remarkable teamwork and opportune timing, all affected materials were successfully salvaged. The incident underscored both the strengths of our collective response and areas where our emergency preparedness could be improved.

Clear and timely communication proved essential during the emergency response and recovery. Daily posters with tasks and instructions helped the salvaging team adapt to shifting priorities. Bi-daily meetings played a pivotal role in maintaining communication and monitoring progress, allowing the team to work together effectively in the fast-paced recovery process. Ensuring staff wellbeing throughout the process—with check-ins, meals, music, and breaks—kept the team motivated and capable of sustaining the long hours required. However, standardized, pre-written initial messages calling an emergency and outlining required level of response could have prevented early confusion and hesitation, leading to a more streamlined initial response.

Since most affected materials were archival in nature, dissociation posed a significant risk during initial response and salvaging efforts. Within the first hour of discovering the leak, a dual documentation system was developed, to track affected items as they were relocated and unpacked. The same documentation was used to track progress during drying, checking, and rehousing. A flagging system to record damages and actions was developed in the following days, but a pre-established log form would have further reduced confusion and saved time as the salvaging process unfolded.

Affected materials were laid out to dry within three hours upon discovery of the leak. Assessment of levels of wetness, replacement of identifiers for collection materials, and removal of wet boxes from the recovery spaces were completed on the first day. Dehumidifiers were installed and interleaving of affected materials started immediately. The team acted quickly but carefully, never jeopardizing safety or materials. However, dry materials were not removed from the affected storage areas on the first day, leading to additional damage on the second day, further straining available resources. Furthermore, some pockets of wetness in the building went unnoticed for several days, highlighting the need for a more thorough and comprehensive approach from the incident management team.

The team's willingness to help was a major strength, but the event highlighted areas for improvement in leadership and coordination. Establishing a clearer chain of command and designating team leads for specific tasks would have improved efficiency. Regular staff training in emergency response and leadership is essential to empower individuals to confidently assume roles and responsibilities in such situations, ultimately enhancing future response efforts.

The paper will offer valuable insights and practical tools that conservators and emergency response leads at other organizations can adapt to improve their own preparedness and response efforts. By sharing lessons learned and successful strategies, it aims to help other institutions streamline their communication, documentation, and leadership processes during emergencies.

Other duties as assigned: the unexpected tasks of preventive care and the lessons of a pre-program Preservation Assistant

Elise Etrheim

Preventive conservation, often heralded as the cornerstone of collection care, encompasses a broad range of tasks critical to preserving cultural heritage. However, the responsibilities of those in preventive roles, particularly early-career professionals, extend far beyond routine tasks of monitoring temperature and humidity or designing storage solutions. These "other duties as assigned" are often not quantifiable but offer invaluable learning experiences that shape a conservation professional's critical thinking, adaptability, and problem-solving skills. This abstract explores the unspoken and often overlooked side tasks encountered during my experience as a pre-program Preservation Assistant at the University of Arizona Libraries Special Collections.

Working in preventive conservation means consistently encountering unexpected challenges that require rapid learning, creativity, and a strong collaborative mindset. These tasks range from adjusting last-minute exhibition installations to emergently responding to a leak, each providing hands-on training in the essential skills of a preservation professional. Though seemingly peripheral, these tasks often become learning moments that reinforce core conservation principles.

One example is the creation of customized archival enclosures for materials

with irregular dimensions and with high use in instruction settings. While this may seem like a routine technical skill, it becomes a nuanced problem-solving exercise requiring a balance between preservation needs, accessibility, and the available resources of the institution. Similarly, my involvement in exhibition preparation—installing, deinstalling, and fabricating mounts—taught me the value of adaptability. Decisions about object placement and long-term protection needed to be made in real-time, often with limited flexibility and strict deadlines. These experiences honed my ability to make informed decisions quickly, a crucial skill for any conservator.

Beyond practical skills, this work fostered collaboration with various departments, from curators and archivists to facilities staff, strengthening my communication abilities. Preventive conservation often demands interdisciplinary cooperation and consultation with those less familiar with preservation, and understanding how to effectively convey the needs of collection care to those outside the field proved vital. These instances also introduced the opportunity for me to develop creative methods of communication, such as an internal 'Bug Bulletin' for integrated pest management and a standardized quarterly report for climate data. The insights gained from these collaborative efforts are lessons that have implications far beyond my role as a Preservation Assistant, contributing to my broader understanding of conservation workflows and decision-making processes.

In this presentation, I will reflect on how these unquantifiable side tasks contribute to a deeper understanding of the complexities of preventive care. By sharing examples of these experiences, I aim to highlight the often-unacknowledged but critical role that "other duties as assigned" play in shaping the development of emerging professionals in conservation. Ultimately, these tasks, though small in scope, have had a profound impact on my ability to think critically, adapt swiftly, and collaborate effectively—skills that are essential in a successful conservation career.

Preventive Care | Research & Technical Studies | MFT-IDG

Lighting Policy as an iterative process with MFT

Hebe Halstead; Authors: Hebe Halstead, Sarah VanSnick

The Victoria and Albert Museum (V&A) has recently implemented a novel lighting policy (discussed in detail in VanSnick & Gaspar, 2024) - seeking to strike a balance between the display of light-sensitive objects and their long-term preservation. This work offers an evaluation of the practical rollout of the policy, refinement of process, and stakeholder uptake.

This policy works by whittling down collection on display to those objects that have the most pressing light vulnerabilities, looking experimentally at those objects, and using that new information to inform how we select vulnerable objects in the future. The first step is determining light vulnerability on a broad material level, flagging objects on display made from materials academically known to be highly light sensitive. These broad strokes are of huge benefit as it ensures that the first action of this policy will target those objects with the potential to be currently undergoing massive light damage. The second phase invites curatorial colleagues to assign a relative value each object in the group of highly light sensitive objects, allowing resources to be targeted in on the most exemplar objects which are materially assumed to be highly light sensitive. Where possible, objects that are highly light sensitive will be rotated out of display in a time period dependent on their rating value. Where rotation is not possible objects are examined experimentally using Microfademetery Testing (MFT).

Objects are unique in their vulnerabilities and these vulnerabilities are not as linear, consistent and predictable as one might expect. Experimentally analysing objects using MFT has the potential to bring their actual current light vulnerability into sharper focus. Given the vast size of the V&A's collection, it is truly unfeasible to experimentally analyse every object - however this policy allows precise targeting of experimental resources to the places in the collection where they are most immediately needed. The lessons learnt about discrepancies between the assumed light sensitivity and the current experimental reality found are fed back into the initial stages of this process, allowing us to redirect resources to more vulnerable objects. For example, MFT conducted on Chinese, Japanese, and Korean lacquerware as part of this process has found this material to generally be drastically less sensitive to fading in practice than was academically thought. Not only does this mean that these objects can have far greater lifespans on display, improving access and ensuring we are focussing on the collections that need us most.

This is not a static system - it is a cyclical process that edits and allows a more accurate picture of the collection's sensitivities to coalesce in each iteration. It allows us to learn about our collection today and to react as the composition and the needs of our collection evolves over time.

Shades of yellow: can MFT foretell light-induced color change of white paper?

Marie Kern; Authors: Irene Brückle, Georg J. Dietz, Ute Henniges, Marie Kern, Fabienne Meyer, Thomas Prestel, Stefan Röhrs, Giulia Vannucci

The light sensitivity of works on paper is an important issue for any paper-based collection with regular exhibition cycles. The main concern is to protect the media from light-induced color changes, and MFT is a proven in-situ method for predicting these changes. As a substrate, however, white paper and especially rag paper is generally considered to be quite stable, with the exception of wood-containing and colored paper, which are considered light-sensitive according to the lighting guidelines. However, within the broadly defined class of white papers – which have been the most widespread worldwide since their emergence – there are also lignin-free white papers that are affected by moderate exposure to light. Our research group – three conservation scientists and five paper conservators collaborating from a print and drawing collection, a conservation science research laboratory, and two universities – studied typical light sensitivities related to compositions of paper and the ability of MFT to predict light-induced change in a broad range of the most typical white paper compositions.

We prepared nine sets of 37 papers divided into four compositional groups that represent papers across time. Three sets were aged in UV-filtered museum and commercial gallery exhibition-simulated settings (LED, mixed fluorescent/daylight, up to ca. 2.5 Mlxh), four underwent cyclic light-dark aging with or without pre-aging, and two sets were micro-faded by two commercially available MFT devices, one with a xenon source, the other a LED source. Using this test setup, we evaluated the influence of paper components on the color development of the papers during these different natural and accelerated aging conditions and compared them with the MFT results. The color change data of all exposures are given in Blue Wool Scale (BWS) by comparison to co-exposed Blue Wool Standards.

Most white papers in exhibition simulation fell into the relatively stable BWS 2.5–4, but aged rag papers and papers containing ligneous and OBA papers ranged at BWS 1.–2.5. The predominant color change tended to be fading, but highly optically brightened (OBA) papers of low quality darkened. Groundwood and other high-lignin papers changed to yellowing after initial fading. Iron-contaminated papers without a significant alkaline reserve also tendentially darkened. Previous light-dark aging cycles had an effect on the type of color changes caused by light. Both MFT types and the cyclic light-dark aging predicted the papers' sensitivity adequately compared to the simulated exhibition exposures and identified the most light-sensitive gelatin-sized rag papers and lignin-containing papers. However, predicting the color change of OBA-containing papers proved to be much less reliable. The color change of the papers that were exposed to LED in the exhibition-simulation was better reproduced by LED-MFT than by xenon-MFT or cyclic light-dark aging.

We hope that the research results of the recently completed project will provide a clearer idea of the role of white paper in predicting the light sensitivity of artworks on paper using MFT.

Our collaborative project was funded by the Germany Research Foundation 2021–2024.

Low Dose Microfade Testing in Air and Low Oxygen Environments to Optimize Long-Term Display for the Emancipation Proclamation

Authors: Henry Duan, Jennifer Herrmann, Lindsay Oakley, Mark Ormsby

Preservation Programs at the National Archives and Records Administration (NARA) investigated the characteristics of iron gall ink (IGI) in low or no-oxygen environments. NARA has vast holdings of 18th,19th, and early 20th century documents with iron gall ink. With the 250th anniversary of the Declaration of Independence, conservators and scientists seek to understand more about long-term display of sensitive IGI documents. In the past, NARA has used sealed anoxic encasements for some permanently-displayed iron gall ink documents. However, recent research into IGI behavior in anoxia [1] as well as material and structural differences between the majority of paper-based documents in NARA's holdings and other treasured national records on parchment meant that the use of a low oxygen display environment needed to be examined.

Scientist Bruce Ford previously demonstrated that fading of iron gall ink is somewhat reversible in the dark but that anoxia diminished this reversion potential. His experiments exposed ink to light levels equal to several decades of display exposure, followed by a period of darkness that allowed ink to revert overnight. We sought to conduct a similar experiment, but with a closer match between typical exposure and rest periods to exhibit conditions. Additionally, we wanted to know if IGI reversion potential could ever be exhausted or would change with past treatment history. Subsequently, we designed experiments using an automated LED MFT (2700K white LED, ~3.1Mlux) in an atypical manner. We repeatedly exposed 19th century, post U.S. Civil War era, non-record samples and paused for reversion periods in the dark on the same spot. We tracked incremental and overall change in color (ΔE00) and L*a*b* color space parameters. We also tracked and controlled temperature and humidity as much as possible to prevent movement during test periods (up to 1.5 weeks) and kept the dose for each exposure as low as possible (0.04-0.4 Mlux-hrs.), only inducing enough change required for reasonable signal to noise ratios. We performed mock de-silking and delamination treatments on historic samples to mimic the condition of many NARA holdings. Treated ink required higher dosages of light to induce the same amount of change as non-treated IGI. We conducted multiple cycles of low-dose MFT both in air and anoxia and were able to reproduce Ford's result showing reversion in air, and significantly reduced reversion in anoxia. We investigated the nuances of reversion in each of L*, a* and b* under each condition. After several tests in anoxia, we reintroduced oxygen up to 2% concentration which showed a returned ability to revert. MFT results were also compared to an experiment with 2 klux LED lamps (up to 4.5Mlx-hrs) where no visible change was observed. This indicated reciprocal failure, however these results still have important implications for display design options for iron gall ink records.

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Research & Technical Studies

A multi-disciplinary solution for the problem of lead corrosion in organ pipes

William Wei; Authors: Mateusz Sluszkiewicz, William Wei

The corrosion of historic organ pipes continues to be a major problem for older historic organs in Europe. This is particularly true in the pipe feet of the larger bass pipes which are made primarily of lead. Corrosion in the pipe foot reduces the load-carrying capacity of the pipes, and makes them more difficult, if not, impossible to tune as corrosion eats away at the pipe wall and eventually breaks through. A number of recent major research projects including the EU COLLAPSE project and a project in Bremen, Germany indicate that the cause is corrosion of lead by acetic and formic acids emitted from the wooden windchest. Several measures have been suggested for dealing with the problem including neutralizing or removing residual acid in the corrosion product, coating the insides of the pipe feet, or replacing the feet with lead-tin alloys.

This research has been primarily chemical in nature. While it provides evidence for the cause of corrosion, the proposed measures have a number of logistical and conservation ethics problems. The production of the acids is continuous, which means that pipes have to be treated regularly with some kind of aggressive solution. Coatings must be regularly maintained and replaced. Given that the affected pipes are usually the large bass pipes in a complex organ structure, such treatments would be a difficult operation to carry out regularly. Furthermore, the proposed measures only treat the symptoms and not the source of the problem, the acid emission into the pipes.

It was noted in the previously mentioned projects that corrosion tended to be worse in organs which were not played as often, and in silent pipes. This led to a multidisciplinary pilot study conducted by the Cultural Heritage Agency of the Netherlands (RCE) to investigate the possibility of venting the pipes when the organs are not played. A team including an organ expert, a Dutch organ builder, chemists and fluid mechanics experts is studying the airflow through pipes as they are played, to see if that correlates with the corrosion in the pipe feet. Three-dimensional (3D) computer modelling and high-speed smoke visualization techniques are being used to determine the airflow within a transparent organ pipe, and locate eventual "dead" zones where corrosive gas concentrations may be higher. Endoscopic techniques are being used to determine the location of the corrosion in pipe feet. A sensor is being developed to measure the acid concentrations in the air in pipe feet.

The results of the fluid mechanics studies and initial endoscopic work indicate that corrosion correlates with dead air zones in the pipe foot. Venting the pipes is possible, and would be best accomplished by reversing the air flow in the pipe, that is, in the opposite direction to playing. Further work is planned to determine how often venting is required, and the most efficient way of doing this using the existing blower, as well as dealing with the fact that the organ will be continuously producing tones while being vented.

Museums and Zoos: A case study of an unusual collaboration for heritage science research and public outreach

Cathryn Harvey; Authors: Fiona Brock, Diana Davis, Cathryn Harvey, Paul Pearce-Kelley

Research into the Deathwatch Beetle infestation on HMS Victory led to a unique collaboration between The National Museum of the Royal Navy (NMRN), Cranfield University and The Zoological Society of London (ZSL): London Zoo. Deathwatch beetles are woodboring beetles that are pests to historic timber structures whose lifecycles can span anywhere between 1-13 years. Historic investigations into Deathwatch beetles made use of live cultures of the beetles for observation and experimentation. However, the cultures were never maintained beyond the course of each research period, much to the detriment of our understanding of the species.

A PhD research project was jointly funded by NMRN and Cranfield University to enhance understanding of the Deathwatch Beetle infestation on HMS Victory

and explore methods of communicating complex conservation information to the public. During investigations into non-invasive methods of larval detection, it became clear that a live culture for study was sorely needed. There seemed little point, however, to starting a culture, only to have it die out once the research was concluded. The main issue is that the culture needs care and facilities to ensure it is maintained and monitored. Enter London Zoo.

London Zoo is equipped to maintain a culture long-term, and it fits within the normal remit and activities. The presence of specialist knowledge for the establishment and long-term development of the culture is essential. Having the culture in a central location with suitable resources and a vested interest in the long-term survival will enable the future research into Deathwatch Beetle activity and behaviour, but it can also serve as a means of public engagement with a wider audience. Remarkably little is known about the Deathwatch beetle, and knowledge gained from the culture would be useful for NMRN, but also other sites dealing with Deathwatch beetle infestations. Research and investigations could be conducted by students of Cranfield, strengthening existing, and establishing new, research ties. Displaying the culture, with explanations, to the public will bring heritage science research and HMS Victory to the attention of a wider audience that would not usually come across it.

For the Zoo, the use of a wood-boring beetle notorious for its cryptid nature to develop non-invasive means of detection, means that techniques and methods can be investigated and tested on a non-threatened species before being used to detect endangered species, like the Fregate Beetle. Wildlife and heritage conservation, and the science and research behind them, can greatly benefit each other.

Testing for lead on sculpture: defining useful thresholds in a liability- and safety-minded America

Sarah Montonchaikul, Ellen Rand; Authors: Sarah Montonchaikul, Soon Kai Poh, Ellen Rand, Lynda Zycherman

Lead and lead contaminated materials can be a danger in art. It can be obvious or hidden, for example: lead-containing primers, pigments, sculpture substrates, corrosion products, pigments, or art that contains contaminated synthetics. Identifying lead-containing materials can significantly change the treatment strategy, require additional safety precautions, and increase costs. However, even with the commercial availability of highly sensitive spot testing kits, determining if the artwork poses a "real" risk is not a straightforward process. Conservators at Monumenta and MoMA recently found themselves in a confusing world of false positives, opaque and uncooperative technicians at testing laboratories, and misleading thresholds. It suddenly became hard to answer the simple question "does the sculpture contain an unsafe level of lead?" using readily available testing materials.

Lead spot-testing kits available for home use range widely in precision, accuracy, and sensitivity, and are marketed for a variety of use cases. Scant comprehensive research available on the efficacy and suitability of commercially available lead spot-testing kits for conservation purposes further exacerbates the challenge of parsing out the differences between tests, making it difficult for conservators to make informed testing decisions. Further uncertainty follows because many laboratory test results offer only "presence or absence" reporting; the identification of lead does not necessarily indicate unsafe levels of lead, only that lead exists in the sample. Additionally, Federal and State standards for the total amount of unsafe lead in parts per million are inconsistent and not well delineated compared to contamination from the environment or another source. Commercial environmental testing solutions also do not provide the interpretation of test results owing to liability concerns.

In response to this need for a reliable lead-testing practice, Conservators aim to develop a lead-testing protocol that includes both interpretation of in-the-field spot testing followed by comprehensive (qualitative) analytical testing using environmental laboratories all to ascertain a creditable risk. This work includes evaluating commercially available spot testing kits for their usefulness, surveying state and federal thresholds for lead-containing coatings, cultivating relationships with toxicologists, and developing strategies to communicate with environmental testing laboratories that are reluctant to interpret data for liability reasons. A summary of research to date will be presented, which represents only the beginning of much-needed research on this crucially important safety topic.

The role of adsorption in the solubilization of paper degradation products: Using treatment observations as a springboard for scientific advances

Teresa Duncan; Authors: Barbara Berrie, Teresa Duncan, Michelle Sullivan

Paper conservators working with different concentrations of agarose gels have observed that stain removal efficacy increases as the gelator concentration is increased. Although the exact process(es) contributing to this increase in efficacy have not been studied previously, many physical phenomena are thought to play a role, including diffusion and capillarity processes involved in the transport of solvent and solubilized components to and from a substrate placed into contact with a gel. We propose that the process of adsorption plays an important role in the sequestration of water-soluble products once they have migrated into the gel. The adsorption of solubilized components by the gel network essentially purifies the bulk solvent in the gel, increasing the uptake of more material and preventing redeposition.

Adsorption measurements of solid agarose indicate that it could remove 90% of crystal violet (hexamethyl pararosaniline chloride, C25N3H30Cl) from an aqueous solution rapidly. Even when engaged in a gel network, agarose is capable of functioning as an adsorbent. Critically, a gelator can do more than act as a vehicle to deliver solvent: it can also trap solubilized components via adsorption onto its polymer chains. By adding a range of additional adsorbents, including microcrystalline cellulose powder and silica gel (200400 mesh), at 1 wt% into agarose gels, we have shown we can increase the adsorption rate and total cleaning capacity of these systems. One consequence is we can reduce the amount of gelator required for a treatment.

If the mechanisms at work within gels are better understood, it may be possible to design systems that amplify the effects of stain removal treatments while reducing the need for expensive and/or unsustainable materials. Agarose, a component of the algal extract agar, is costly due to the purification process involved in isolating the polymer and the limited availability of the algae from which it is derived.[1] However, agarose is often preferred for gel treatment of paper due to its minimal deposition of residue and the good aging properties of those potential residues.[2] This research offers an approach to decrease the quantities of this important resource needed to carry out a conservation treatment. The applicability of adsorbent-bulked agarose gels in hands-on conservation practice is being tested, and the effectiveness of specific adsorbents for certain applications is being investigated. Through the close collaboration between scientist and conservator, conservation practice informs scientific experimentation, and analytical results can impact treatment methodologies.

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On the development of Xanthan-Konjac/ Agar physical hydrogels and their analogs for conservation cleaning applications

Matthew Cushman

In recent decades, conservators and conservation scientists have proposed additions and refinements to the conservation cleaning toolkit, drawing inspiration from allied fields and leveraging expertise from industrial chemists and soft matter scientists. As a result, the field has seen continued progress toward options with improved control and specificity while also favoring materials and techniques that are more sustainable and safer for the practitioner and the environment.

Inspired by conservators' creative adaptations of rigid physical hydrogels and the working properties of chemical hydrogels adopted by the field in recent

years, this paper describes the development of physical hydrogels that are thermoreversible, optically clear, cohesive, flexible, and conformable with surprising elasticity and gel strength. Drawing from food science, haute cuisine, and traditional foodways, the shared formulations are based on the synergistic binding of xanthan gum and konjac glucomannans modified with a second network of agar or agarose. These versatile, cost-effective gels are simple to produce and are compatible with typical aqueous preparations used in conservation cleaning. Additionally, these hydrogels provide options for delivery of small proportions of organic solvents and microemulsions capable of swelling and removing tenacious coatings and overpaints with minimal mechanical action. Analogous formulations substituting other glucomannans or galactomannans and selecting agar instead of agarose offer flexible decision-making favoring economic and environmental sustainability by sourcing materials native to many regions around the globe.

The development of xanthan-konjac/agar gels and their analogs has been informed by early tests in several cross-specialty professional workshops and academic courses, providing key insights into how this versatile addition to the cleaning toolkit complements our established range of rigid gels, viscous polymeric solutions and spreadable gels, viscoelastic gels, and chemical hydrogels. Case studies from collaborators will be shared in another proposed submission.

Developments in Safer Solvent Selections for the Removal and Application of Synthetic Resins

Melinda Keefe; Authors: Gwendoline Fife, Roise Grayburn, Bethany Karl, Melinda Keefe, Alan Phenix, Vikram Prasad

A unique partnership comprising focal points from academia, chemical industry, non-profit, and private practice was carefully curated with specific expertise, capabilities, and priorities to advance safer solvent identification and education for cultural heritage use. The work highlighted within is a continuation of the "Safer Solvent Selections for the Removal and Application of Synthetic Resins" paper presented at the 2024 RATS Specialty Session of the annual AIC meeting. The work justification and vision is unchanged from last year: conservators seek solvents for the application and removal of polymeric resins that a) are no/low-odor, b) have minimal health and environmental impacts and c) achieve the necessary solvation and film properties.

Previous work identified solvent blends that met rigorous GHS-defined safety criteria and demonstrated ranges of solvency for Laropal A81, PARALOID™ B72, and PARALOID™ B44. This presentation will provide the next stage of research with advanced solvent blend considerations, characterization of polymeric films properties casts from select blends, and Greener Solvents project partner feedback on test evaluations. A dialogue with the AIC community is critical to bring this research into practice over time. We look forward to productive discussion that moves the field towards safer solvent alternatives that work.

Challenges and benefits of community-based participatory research (CBPR) in technical art history and conservation science: The Tikuna/Magüta blue case

Thiago Puglieri

Collaborations among scientists, conservators, and curators have been fundamental for understanding and conserving objects like from fine and modern arts. Those collaborations have been successful in many cases, but in others, have been limited especially due to challenges associated with team dynamics. Professionals from different fields may use different terminologies and have different understandings of how cultural items should be used, conserved, and studied. The challenges are intensified when considering the engagement with non-academics, who have other terminologies and may be personally and culturally attached to the cultural items. For example, collaboration with local non-academic Indigenous people may be vital when scientifically investigating cultural items of communities still practicing their traditions. But when, why, and how scientists can or should cooperate with them?

In my research group, we are investigating a still unknown blue colorant among technical art historians and conservation scientists (https://doi.org/10.3390/heritage7090222). Such colorant has been prepared by the Tikuna/Magüta people, who live in the Amazon Forest near the borders of Brazil, Peru, and Colombia. The ethnologist and anthropologist Curt Nimuendajú described in his book, published in the 1950s, that "the juice of one fleshy fruit (T., na'inku) furnishes a dark violet which, upon contact with iron, changes into a clear blue." To investigate materials like this, scientists usually select cultural items from museums for analytical investigation, try to make the colorant using the historical recipe, or get a sample of the colorant directly from the community. All those options consider the publication of the results in scientific journals, which are usually investigator-driven and academically centered strategies that generate benefits mainly for the researchers and their scholarly fields. However, the Tikuna/Magüta people are a living culture, still producing colorants from natural sources, and it is vital to consider their collaboration in the research for mutual benefits.

Among the different approaches for community-engaged research, we have been exploring community-based participatory research (CBPR). CBPR has social justice and empowerment at its foundation and considers community members' participation from formulating research questions to developing methods and collecting, interpreting, and using data. It considers power-sharing with the community members, is based on the community's strengths and resources, promotes reciprocity and mutual learning, considers the outcomes' sustainability, and disseminates results for all interested parties and partners. In these kinds of research, Indigenous members can participate as collaborators instead of subjects or sources of materials.

CBPR has been employed in fields like healthcare, archaeology, and education. Still, it has yet to be explicitly and systematically explored in technical art history and conservation science. In this presentation, I will address the challenges and benefits of CBPR in the context of technical art history and conservation science, based on our case study of the Tikuna/Magüta blue colorant and experiences of CBPR in other fields from different authors. With our work and this presentation, I also aim to stimulate discussions about how we can promote more socially responsible and inclusive practices in technical art history and conservation science.

Embracing Uncertainty: Exploring New Perspectives in the Story of a Chinese Lacquer Screen

Elle Friedberg; Authors: Elle Friedberg, Annette Ortiz Miranda

Historically, museums are perceived as repositories for definitive knowledge on the objects they exhibit. As a result, artworks that conservators and curators have the most questions about often remain in storage and out of public view. At the Walters Art Museum (WAM), a shift towards showcasing objects with unresolved histories has fostered engagement and curiosity from visitors.

The unexpected results of a recent technical study of a Chinese lacquer screen prompted a reassessment of whether and how it could be displayed. Inscribed with the date 1681, the four-panel screen depicts the hermitage of fourth-century scholar Xie An. This type of lacquerware was popularized during the Kangxi period of the Qing Dynasty (1661-1722). Kuan cai, meaning "incised colors," refers to the technique in which compositions are carved into a smooth lacquer surface and filled with colored paints. Kuan cai screens were first produced for the domestic market in Southern China in the seventeenth century. They are commonly known in the West as "Coromandel screens" or "Bantam work," referring to two popular European-run trading ports in Southeast India and Indonesia from which they were first exported.

Kuan cai screens are made from a complex layered system of wood, clay-based grounds, fabric and paper preparatory layers, lacquer, and oil-based paints. Due to their composite nature, damage from fluctuating environments, mechanical forces, and light is common. The WAM screen entered the collection in 2012 but has never been exhibited. Prior to acquisition, it underwent multiple restoration campaigns which now partially disguise the original surface. The goal of this technical study was to determine the composition of the screen's original and restoration materials to draw inferences on dating and historic context. Multiband imaging, microscopy, radiography, fiber optics reflectance spectroscopy (FORS), x-ray fluorescence spectroscopy (XRF), scanning electron microscopy with energy dispersive x-ray spectroscopy (SEM-EDS), pyrolysis gas chromatography/mass spectrometry using tetramethylammonium hydroxide (THM-Py-GC/

MS), and cross section analysis were completed.

While the screen was initially attributed to the seventeenth century, our results support the hypothesis that it was created during a later period. Radiography revealed an atypical construction with numerous nails attaching six horizontal cross bars on the verso. XRF showed the presence of zinc white in areas of white polychromy, while barium was detected in several passages of the screen in a variety of colors. Barium-based pigments were not available until the eighteenth century, raising questions about the screen's dating and the extension of restoration. The absence of vermilion, orpiment, copper-based, and other commonly reported pigments was curious.

WAM has established a precedent for displaying objects with pending questions. In the 2024 exhibition "Objects of Curiosity: What Will We Discover?," visitors engaged in an ongoing conservation and curatorial investigation of artworks whose origin, authenticity, or utility were unknown. Taking inspiration from this exhibition, to tell the story of the lacquer screen we are developing didactic materials that reveal its layered history of use and repair. This approach to telling the stories of artworks situates visitors as active participants, rather than passive receivers of resolute information.

Our Elusive Yellow Whale: New Findings on the History and Identification of Patent Yellow/Lead Oxychloride Pigment in Painted Heritage Objects

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Recent discoveries of Patent yellow (also known as Turner's yellow) a brilliant yellow lead-based pigment, in collection objects from The Colonial Williamsburg Foundation initiated research into the history and use of this under-researched colorant and an exploration of the most suitable analytical methods for its identification. Patent yellow's precise introduction date and narrow window of use (1781 – ca. 1830) make it an important benchmark for dating and contextualizing objects, while recent documentary research shows it was an important and widely used inorganic yellow that may have been produced in the United States as early as 1783. However, it is little-known and rarely reported in conservation or art historical literature, possibly because lead (in the form of lead white) is ubiquitous on most historical painted surfaces, and chlorine, especially in the presence of lead, can be challenging to detect with techniques common to most conservation science laboratories such as XRF and SEM-EDS. Efforts to find and obtain reference samples of this pigment were fruitless, and attempts to synthesize it have, to date, been unsuccessful. These and other conditions can make this yellow frustratingly elusive to confirm.

Collaborative analyses carried out at Colonial Williamsburg using cross-section and polarized light microscopy, XRF, and SEM-EDS, with further analysis using XRD and Raman spectroscopy at the Smithsonian Natural Museum of Natural History and the University of Delaware Microscopy and Microanalysis Laboratory have contributed to a better understanding of this pigment and challenges to its identification. Findings indicate its chief component is lead oxychloride ($Pb_7O_6Cl_2$), consistent with Lorettoite, a (now-discredited) lead mineral, although other lead-oxide-chloride phases may be present. Raman and new XRD data for Patent Yellow have been obtained through this research, which has not previously been reported elsewhere in heritage science literature. Photomicrographs of Patent yellow paint dispersions collected from case studies illustrate some previously unreported optical and morphological properties and demonstrate the effectiveness of polarized light microscopy in identifying this pigment, as it exhibits unique microscopic characteristics compared to other yellows, making optical microscopy a critical, simple, and effective first step in identification. Patent yellow case studies include varied decorative and fine art objects such as a painted coffeepot, a drum, a chair fragment, an easel painting by a Baltimore portraitist, and, most recently, a period room at the Museum of Early Southern Decorative Arts. This research suggests that Patent yellow/lead oxychlorides may be more common in painted surfaces than previously documented. It is hoped these findings can facilitate the identification of this pigment in other collections to better understand its broader use, properties, and role in late-eighteenth and early-nineteenth-century painted cultural heritage.

Joe Overstreet: searching for an unknown truth

Corina Rogge, Silvia Russo

Joe Overstreet (1933-2018) was an innovative artist who defied easy categorization. Interested in art from a young age he studied in California at different institutions but by 1958 he felt he had outgrown the West Coast and moved to New York where he became friends with many of the abstract expressionists and color field painters working there. Always politically motivated, many of his works from the 1960s directly referenced the civil rights movement, some such as The New Jemima(1964) are overtly figurative whereas others, such as 16th Street Birmingham (1963) and Strange Fruit (1965), are more abstract. In the late 1960s, urged by Frank Stella and Sam Gilliam, Overstreet began to create shaped, unprimed canvases painted in acrylic with bold geometric patterns that referenced his African and Shoshone heritage. These works, exemplified by North Star(1968) and Justice, Faith, Hope and Peace, presaged his growing interest in the sculptural possibilities of paintings. In his next, perhaps best-known series of works Overstreet freed himself from the stretcher altogether. His mandala paintings, such as Hoo Doo Mandala(1970), retain the geometric patterns of the shaped canvases but are stretched onto the surface of the wall. His slightly later flight patterns incorporate the soak-stain approaches of Gilliam and Frankenthaler and are held in taut geometric shapes through ropes attached to the walls, floors, and ceiling. Overstreet indicated that his use of ropes referenced both construction techniques used by Ancient Egyptians, and the ropes used in lynchings, while his desire to create easily transportable works was an homage to his nomadic ancestors who survived with our art by rolling it up and moving it all over."The founders of the Menil Collection, John and Dominique de Menil had a long association with Overstreet, purchasing The New Jemimaand several flight patterns. Through this connection he was invited by Larry Rivers to participate in the 1971 Some American Historyexhibition and in 1972 Dominique organized a solo show of Overstreets works at the Rice Institute for Arts. In 2025 the Menil Collection will open Joe Overstreet: Taking Flight,which brings together shaped canvases, mandalas, flight patterns and his seminal late series of oil paintings made after visiting Senegal in 1992. This exhibition, and access to Overstreets artworks and studio materials provided by the Eric Firestone Gallery and Corrine Jennings, Overstreets partner, provided an unparalleled opportunity to begin to examine Overstreets materials and methods. Overstreet said that My work has changed every picture I've ever made, because I'm searching for the unknown truth, but how did his materials and methods change over time? Non-destructive analysis by XRF and limited sampling revealed a shift in pigments, and an increasingly complicated painting process as he moved from shaped canvases to mandalas to flight patterns while his Senegal series marks a return to the use of oils, particularly those of the New Holland line. This is the first in-depth study of this seminal artists practice and helps reveal the various ways he sought to express his truth.

Secret Sauce: Investigating the Materials in Whistler's Nocturnes

Georgina Rayner; Authors: Sophie Lynford, Georgina Rayner

Beginning with his Nocturnes, Whistler began diluting his oil paint with a secondary medium he referred to as his "sauce." Such a fluid medium allowed the artist to work wet-in-wet, and facilitated scraping, rubbing, and scumbling. While there are primary source references to copal being used in his "sauce," there have been no technical studies that have identified copal as an ingredient that Whistler employed. In the 1980s and 1990s, Stephen Hackney and Joyce Townsend collaborated on a series of technical studies on paintings by Whistler in the Tate, National Gallery of Art, and Hunterian Art Gallery, among others. Their research did not find any evidence of copal, instead determined that turpentine and mastic varnish were added to the oil paint to create the sauce.

The four Nocturnes in the Harvard Art Museums' collection (1943.171, 1943.172, 1943.173 and 1943.176) were completed over the course of the 1870s. The paintings are significantly understudied, largely due to their inclusion in the Winthrop collection, which stipulates their continuous display in the galleries and prevents their travel. The closure of the museum during the pandemic provided a rare opportunity to study the paintings. This research aimed to contribute up-to-date material analysis to compare with primary sources and build on the work of both Hackney and Townsend.

A small set of samples were taken from each painting and were either prepared as a cross-section or analyzed by thermally assisted hydrolysis and methylation pyrolysis-gas chromatography mass spectrometry. A comparison of the data has revealed some insight into Whistler's painting materials and technique for this set of paintings. In darker compositions (1943.171 and 1943.173) multiple layers of media rich paint, some of which were unpigmented and all varying in thickness, were applied. This is in contrast to lighter compositions (or areas, 1943.172 and 1943.176) where single, relatively thick, pigment rich layers were applied. In these layers the addition of organic media was observed, in patches or waves, suggesting incomplete mixing. Pinaceae resin, may at the very least be suggested to be part of Whistler's 'sauce' based on the analysis conducted here. Using written accounts as a guide the use of turpentine could be suggested, which would result in a more fluid paint medium which is a characteristic of Whistler's paint. Analysis also suggests the recipe for Whistler's sauce was not fixed, with evidence found for the incorporation of bleached shellac (1943.171) and perhaps mastic (1943.172) into the paint in some but not all of the nocturnes.

The Chronology of a Painting - Le Déjeuner sur l'Herbe: Sketch, Copy or Replica

Maureen Cross; Authors: Silvia Amato, Maureen Cross, Karen Serres

The Courtauld Gallery's version of Edouard Manet's iconic painting Le Déjeuner sur l'Herbe is perplexing. It has long been thought to be a copy created after the iconic large-scale French masterpiece of the same title; a work described as a founding moment of modern art by the last great old master. The Courtauld's smaller work, painted "in a curiously harsh and hasty style" (Wilson-Bareau, 1986), and the large Musee d'Orsay canvas has long been a subject of scholarly debate. The Courtauld canvas has indeed been considered to be a preparatory sketch, a later replica of the d'Orsay version, or even a copy by a later hand

This Courtauld "sketch" was purported to have been commissioned by a close friend of Manet, Commandant Hippolyte Lejosne. However, according to the Gallery archival records the Courtauld painting was understood to be a gift from the artist to his friend. Following the Commandant's death, the Lejosne family (of Maison-Lafitte) approached the Galerie Duret, one of Manet's key dealers in Paris, who took the work on commission. In June 1928, the small sketch was brought to the attention of Samuel Courtauld by his principal art advisor and top London art dealer, Percy Moore Turner. Mr. Courtauld purchased the painting, and later, in 1932, bequeathed it to the newly formed Courtauld Gallery

Although signed by Manet in the lower left, scholarly debate has also extended beyond the painting function and onto questions over attribution. Much has been written about the narrative and symbolic meaning behind the making Le Déjeuner sur l'Herbe but the ambiguous status of the Courtauld work is in no small part due to the fact that the painting had not the focus of a materials investigation, nor had it been painting treated in the Courtauld Conservation studio for over four decades. Now, after an in-depth material investigation and the full conservation treatment this paper endeavours to explore the relationship of the Courtauld's painting to the largescale signature work housed in the collection of the Musee d'Orsay.

This paper is a typical collaborative story between art history, science and conservation. Working closely with the curator, the conservator and the conservation scientist considered the painting materials and artistic working practice in an attempt to shed new light on the meaning behind the making of Courtauld's version of Manet's iconic work. Using new techniques, such as macro-XRF scanning and steadfast archival research methods, it hopes to propose a possible chronology by looking at the notions of the artist's sketches, working as well as later copies and finally look at the possibility of replicating by another hand.

Exploring the High-temperature Degradation of Athenian Red-figure Pottery Used in Cremation Burials

Celia Chari, Nicole Ledoux; Authors: Celia Chari, Susanne Ebbinghaus, Katherine Eremin, Nicole Ledoux

Red-figure pottery is a type of ancient Greek ceramic that originated in Athens in the later 6th century B.C. It typically features decoration in diluted clay slip that turns black after firing and is painted on a clay body that appears reddish orange. This kind of ware was used in daily life, dedicated in sanctuaries, and placed in tombs. The "red" areas contain hematite (Fe_2O_3), and the black background contains magnetite (Fe_3O_4) and hercynite ($FeAl_2O_4$). The red and black designs of Attic pottery have been shown to result from a complex firing process involving cycles of oxidation, reduction, and reoxidation. Initially, fine-grained red hematite is reduced to a dense, vitrified layer of black magnetite and hercynite, which resists reoxidation. In the final oxidation step, only the coarse-grained, porous ceramic body reoxidizes to red hematite, creating a sharp contrast between the red figures and the glossy black background (1–3).

The Harvard Art Museums house an impressive collection of Athenian red-figure pottery. This includes the focus of this study, the so-called Bouzyges krater (1960.345), a 5th century B.C. mixing bowl for wine and water, named after the protagonist of the mythological scene depicted on its front. Although there are areas of well-preserved red-figure decoration on the krater, other areas display various levels of discoloration. The pronounced differences between adjacent sherds suggest that some alterations occurred after the vessel was broken, likely due to its involvement in a cremation burial. In such burials, ceramic vessels, often used as grave goods, were likely thrown onto the pyre and then swept into the burial, leading to the discoloration seen on the krater. Funeral pyres can reach temperatures up to 1000 ^{0}C, creating a partly reducing environment due to the evolution of carbon monoxide and dioxide from burning bodies (4). It is to be expected that the temperature and oxidation/reducing environment will vary across the pyre, causing the broken fragments to display different degrees of discoloration. On some fragments, the red ceramic is altered into grey due to the reduction of hematite. On others, the black gloss is partially altered into red, suggesting high-temperature oxidation of the iron oxides occurred in areas of the fire where oxygen was more abundant.

The disassembly of this vessel as part of its conservation treatment provides an ideal opportunity to study the krater, shedding light on the high-temperature material changes observed from the surface of the slip to the bulk of the ceramic. Using techniques such as SEM-EDS, X-ray diffraction, Raman, and FTIR spectroscopy, this material study will be important for the conservation of similar ceremonial vessels, furthering our understanding of their involvement in ritualistic practices.

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Textiles

Facing the Unknown Together: Conservation of Mexican Costume Collection by Pedro Loredo

Alejandra Flores Paredes, Zulema Paz Rodriguez

Pedro Loredo (1923-2010) was a Mexican fashion designer who stood out for his distinctive style that drew heavily on Mexico's pre-Hispanic heritage, incorporating elements like Mitla architecture and Mexica designs. Named "ambassador of Mexican fashion to the world" he created a collection of over five hundred dresses, as well as designed costumes for Mexican talk shows, movies, and "telenovelas." After his passing, these costumes were safeguarded by his sons, Tonatiuh and Pedro Loredo, who cherished them as a testament to their father's legacy. Our connection with them began with treatment on one of the dresses during our college years and continued with the Loredo family's plan to write a book about his life and work.

Since that moment, our collaboration transformed the conservation project into a shared journey of discovery. Their insight, as knowledge keepers, into the designer's life was a guide for our work as conservators. Through this project, we demonstrated how facing the unknown together—through open communication and nourishing relationships—can lead to more meaningful conservation outcomes. The conservation proposal for "The Pedro Loredo Costume Collection," includes the creation of a survey form addressing the condition report, the characterization of the collection, and an assessment of the storage location.

The proposal was based on a "Systems Approach" methodology that examines interactions between the Collection, Space, Operators, and Users. Documenting the collection and uncovering its scope, variety, and condition, which had been unknown for years. The proposal also involved cataloging the costume collection, assessing the condition of the storage space, and conducting discussions and interviews with conservators, photographers, fashion historians, and the knowledge keepers.This model, focused on human aspects, helps us to identify key areas for maintaining the collection and collaborating in more enriched ways with our professional experience as conservators.

During this process, we recognized the value of building a relationship with the owners to reconstruct the history of the collection and detect priorities. Understanding the deep personal and historical significance of the collection through interviews and listening to their stories, we were able to make better-informed decisions throughout the conservation project. These narratives not only enriched our approach to Pedro Loredo's work but also allowed us to reconstruct a significant period in the history of Mexican fashion, and to highlight the need for specialized conservation efforts in this field.

If you Give a Mouse a Cookie: The use of Solvent Gels, Painted Overlays, and a Heating Pad in the Treatment of a Crazy Quilt

Michelle Leung

An unfinished crazy quilt, dated 1886, by the Ladies of the Presbyterian Missionary & Aid Society in Reedsburg, Wisconsin was slated for rotation in August 2024 for the Art of the Quilter exhibit at the Art Museums of Colonial Williamsburg. Crazy quilts are a class defined by asymmetry and Victorian fancywork that reached peak popularity at the end of the nineteenth century. They use an abundance of different fabrics, particularly weighted silks, which are notorious for their propensity to split and shatter over time. When combined with a smorgasbord of decorative techniques, such as the painting, stuffed-work, ribbon-work, stamped inscriptions, metallic thread, applique, and plentiful embroidery used in this example, a plethora of unique conservation challenges develop all on the same quilt. These condition issues required several novel solutions, including the use of painted overlays, solvent gels, and gentle adhesive reactivation with a heating pad.

Painted overlays were used to stabilize patches of split and shattered silks. The patches were irregular in shape and neighbored by a variety of colors. Overlays of nylon bobbinet were painted with PROfab textile paints and Golden Artist Colors acrylic paints to match color transitions and fabric patterns. This allowed the overlays to be secured in more stable neighboring patches and to match, rather than obscure, pattern elements.

Solvent gels were utilized in stain reduction for an area in which a small L-shaped tear had formed. The stain was dark and stiff in character and tests indicated that it was soluble in acetone. Agarose gels immersed in acetone for 24 hours were tested at 2%, 3%, 4%, and 5% w/v concentrations on mockups. Concerns about solvent spread and tideline formation also led to experiments with a dabbing technique. Testing directly on the stain with 4% w/v gels resulted in significant stain reduction and a yellow tone visible on the spent gels. However, when treatment proceeded with new 4% w/v gels, the same results could not be achieved. The issue could be attributed to a change in rheology caused by longer acetone immersion and treatment proceeded with 3% w/v gels instead. The dabbing technique was employed with some success in areas with limited access.

A heating pad was used to reactivate the adhesive treatment for a cracked and brittle painted flower on a velvet ground. A large tear had formed through the center of the painted flower, accompanied by a small loss. An adhesive approach was selected due to the brittle nature of the area; however, reactivation by solvent or a heat spatula carried chemical or mechanical risks for the paint. Aiming to utilize its tacky nature as a pressure-sensitive solution, undiluted Lascaux 360 HV was selected as the adhesive and applied to a heavy-weight Japanese paper. Unfortunately, testing indicated that contact pressure alone was unlikely to result in a strong enough bond. A consumer-grade heating pad, advertised to achieve up to 60°C (the activation temperature of Lascaux 360 HV is 50°C), was tested and employed for the treatment, resulting in a successful, though fragile bond.

It Takes a Village: Collaborations as a Critical Element in the Development of Pesticide Safety Programs

Maria Fusco

The presence of pesticide residues in art historical collections has been researched for decades with increased activity in recent years as more museums are actively testing collections objects and sometimes working spaces. While much information has been shared on detection methods, there is less discussion of next steps, i.e., the development of safety programs to guide staff in how to safely interact with such collections. The George Washington University Museum and The Textile Museum rapidly accelerated assessment and response activities in this area in 2023. Object detection methods were standard (detection of inorganic pesticide residues via portable X-ray fluorescence spectroscopy). But unique collaborations and creative resource employment expanded the ability to test facilities for both inorganic and organic contaminants. Even more so, these collaborations aided the development of robust safety programs which employ industrial hygiene methods of mechanical and administrative controls. Partnering with safety professionals bolstered conservation staff's operating ethos that testing data should drive any response. Personal protective equipment use was formalized and expanded, cleaning regimens were mechanized, signage and logs were used to underscore new training, barriers to compliance were removed, waste removal was formalized, industrial hygiene workflows were employed and new internal guiding documents were developed. Partnerships transformed this process: with industrial hygienists, government organizations, museum, and university colleagues. Collaboration was critical to advancing these efforts as existing industrial hygiene models could be leveraged rather than creating such programs from scratch.

Strategic(?) use of adhesive in treating fractured silk gauze layers of a complex garment

Jennifer L. Cruise

A wedding ensemble of bodice, skirt, and veil, dated to 1840 in the collection of a regional museum was partially cleaned and entirely conserved. It had been worn at least twice, most recently by a descendant of the original owner in 1941, 101 years after it was made. The top layer of both bodice and skirt were of silk gauze, which was badly soiled on the skirt and fractured and torn on both pieces. Both featured a second robust layer of heavy silk satin, and the bodice

had a further sturdy lining of plain-weave linen. Accessibility of the gauze layer for treatment was made difficult by its incorporation into cartridge pleats at the skirt waistband, and into all construction seaming of the bodice. Conservation involved partial disassembly of the skirt for wet cleaning and extensive underlays or overlays of silk crepeline on both pieces. A variety of seam and edge treatments were employed, including machine and hand stitching, with and without the addition of adhesive.

Reflections on Twenty-Five Years in Private Practice

Camille Myers Breeze

Not all museum conservators work in museums. This is a common start to conversations between conservators in private practice and our acquaintances, family, and potential clients. Sometimes it takes the insights of outsiders to the art world to realize just how demanding this career choice can be. Twenty-five years ago, I found myself in the position that many conservators have or perhaps will have when work opportunities and life goals do not line up. The result was the establishment of Museum Textile Services, which allowed me to combine my experience working at regional conservation labs with what I had learned growing up in a family full of self-employed academic and technical specialists. This presentation will cast a frank and occasionally humorous light on how to meet both the expected and unexpected challenges encountered by conservators in private practice, and how today's post-pandemic economic and social climates are fuel for advancement and improvement in our practice. The newest statistical information about demographics in both emerging conservation professionals and experienced professionals choosing to temporarily or permanently turn to private practice, will be gathered in a survey to be released in January, 2025. These findings will build on the Summer, 2024, survey by the newly inaugurated Icon Private Practice Group in the UK, and the 2024 survey on Mental Health in the Conservation Workplace that was circulated by the AIC's CIPP community.

"Form Inventions": A Technical Analysis of Barbara Rossi's Prints on Textiles

Megan Creamer, Stephanie Strother; Authors: Megan Creamer, Gillian Marcus, Stephanie Strother

Barbara Rossi (1940-2023) was a preeminent member of the Chicago Imagists, a loose collective of artists associated with the School of the Art Institute of Chicago in the mid 20th century who frequently exhibited together and produced a striking body of Surrealist-influenced art. Rossi is primarily known for her paintings, drawings, and prints, which she produced on substrates as diverse as paper, masonite, plastic, and textiles, often incorporating elements of collage and mixed media. Thematically, Rossi's artistic style is characterized by grotesque abstractions, with figural representational components such as teeth, hair, hands, and feet rendered in her distinctive style of fine lines and subtle coloration. A recent acquisition of 24 of Rossi's prints on a variety of synthetic fabrics were acquired by the Textiles curatorial department at the Art Institute of Chicago just before her death in 2023. These joined a selection of over 70 works on paper by Rossi in the Prints and Drawings department. A corpus of her work including a selection of these prints and textiles were brought together in the Four Chicago Artists exhibition at the Art Institute of Chicago in the summer of 2024. This presented an opportunity for conservators across the disciplines of textiles and paper to perform a technical analysis and comparison of her materials and methods on paper and textile substrates.

Processes developed by fine artists and commercial printers have resulted in distinct combinations of methods, materials, tools, equipment, terminology, and traditions that are often disparate between printing on textiles versus paper substrates. Using equipment and materials intended for paper print production to print on textiles,however, does have recognized art historical precedents, including James Ensor's influential 19th-century experiments with etching on satin weave silk. In the 1960s and 1970s, Rossi drew on these histories to produce several sets of monoprints using the same etching plates across widely varied textile and paper substrates. These series, created by mixing techniques and materials, resulted in unique impressions from the printing plates as they were worked and re-worked for each print. Our research explores the social and art historical context in which these works were made, complemented by a technical exploration of Rossi's textile substrates as well as a comparison of the visual and aesthetic qualities of the prints on textiles with the more well-known prints on paper. Analytical methods include imaging, XRF, FTIR, polarized light microscopy, stereomicroscopy, and analysis of paper and textile manufacturing.

In the French Style: The Conservation of an 18th Century Chinese Tapestry in the Collection of the Cleveland Museum of Art

Margaret O'Neil; Authors: Marlene Eidelheit, Robin Hanson, Margaret O'Neil, Valerie Soll

Among the hundreds of tapestries treated by the Textile Conservation Lab at the Cathedral of St. John the Divine was an unusual 18th-century example woven in China but incorporating some European tapestry techniques, in the Cleveland Museum of Art's collection. The tapestry was to be featured in a 2023 CMA exhibition China's Southern Paradise, Treasures from the Lower Yangzi Delta. This tapestry had unusual features including a vertical warp and presented many challenges; a stitched treatment was not an option due to the extremely fragile raw silk warp and silk and wool weft. Previous darning and patching treatments created more losses and breaks; condition issues including tide lines and prior treatment campaigns were documented by CMA in summer 2022 and the tapestry photographed at that time. It was determined that an adhesive treatment was the only viable option. Extensive testing of adhesives and substrates resulted in the choice of BEVA 371 1mm film on lightweight cotton patches, reactivated with a heated spatula to consolidate the breaks. This presentation will cover the tapestry's history, compare Chinese and French tapestry manufacture, and discuss prior treatments and current condition issues. Adhesive testing will be detailed and the treatment itself outlined.

Glue Me Once, Glue Me Twice: Adhesive Retreatment of an Early 18th C Embroidered Palampore

Annalise M. Gall, Karri Vaughn

This presentation documents the evolving treatment of an early 18th century Indian palampore in the Saint Louis Art Museum collection. The palampore depicts a tree of life motif, executed in silk chain stitches on fine cotton twill weave ground. It is an impressive example of ari (hook) embroidery, and would have taken many expert hands and hours to complete at this size (132.5 in. x 98 in.). Most palampores are printed; only two other embroidered palampores have been identified in western collections (Museum of Fine Arts Boston, Victoria and Albert Museum).

When acquired in 1922, this palampore was considered an exceptional example. It likely hung on display at the Saint Louis Art Museum for many years, until it was sent out for treatment in 1939. An independent textile restorer, Helene Fouché, was hired to stabilize the ground fabric that had torn with the weight of the embroidery. The palampore was both stitched and adhered to a full backing, using an adhesive which she described as "liquid thread." Once returned to the museum, the curator Thomas T. Hoopes expressed his dissatisfaction, noting that the adhesive had already discolored, and fearing further damage.

In 2022, the palampore was chosen as an ongoing graduate summer internship project. By then the palampore was in extremely poor condition and required an in-depth treatment. With further aging, the adhesive deposits had stiffened, causing fracturing and breakage of the ground fabric. The entire ground had lost flexibility and yellowed, in addition to the brown spots of adhesive residue throughout the textile. That first summer, treatment focused on solubilizing the adhesive and removing it with a suction plate.

In 2024 treatment shifted to restabilizing the splits and areas of loss. The adhesive removal had brightened and softened the ground, but the fabric remained too fragile to stitch into. It was therefore determined that another adhesive treatment was the best course of action. An overall support could not be used, as distorted "excess" ground fabric remained puckered within the embroidery motifs. Small localized adhesive supports were instead custom cut for each area of damage, and laid perpendicularly on flat ground to bridge splits and support the edges of losses.

Though much was accomplished during these two ten-week internships, treatment of the palampore is ongoing. There is more adhesive stabilization to be completed, as well as compensation for loss, and development of a mounting plan. It has proven to be a complex, yet rewarding collaboration thus far, and the authors welcome reflections and suggestions before its continuation.

Alf Engen Ski Museum Gets a Lift

Reilly Jensen; Authors: Marie D. Desrochers, Steph Guidera, Reilly Jensen, Kaela Nurmi

At the 2024 American Institute for Conservation (AIC) Annual Meeting in Salt Lake City, the AIC Emerging Conservation Professionals Network (ECPN), Utah Field Services (UFS), and AIC Textile Specialty Group (TSG) joined forces to describe, assess, and rehouse a collection of ski fashion history objects at the Alf Engen Ski Museum in Park City, Utah. The 2024 service day, or Community Partnership Project (CPP), brought together UFS and AIC members to serve a local audience in the conference host city.

The Barbara Alley Simon collection comprises 350 separate items and accessories spanning 30 years of ski clothing history (1968-1998), and it is a cornerstone of the Alf Engen Ski Museum. Until recently, the collection featured in an annual fashion show, demonstrating a heavy use of collections in a community-focused way, but in opposition to preservation "best practices." Textile conservators had not previously consulted on this collection of objects as few conservators work in the region, with even fewer textile-focused conservators available.

Utah Field Services is a partnership among the Utah Division of Arts & Museums, Utah Humanities, and Utah Historical Society. Together, UFS supports the preservation and access of collections by assisting Utah's museums and collecting institutions. UFS staff facilitated a community-centered approach, avoiding the extractive/negative associations a host site might feel when allowing strangers to directly handle and address their collections. TSG was brought into the project, providing specific necessary textile expertise and insight to materials. TSG, is a subset of AIC; conservators interested specifically in the care and preservation of textile materials. AIC and USF ordered supplies and coordinated logistics to support the success of this new interdisciplinary partnership, from conservators to service providers, to host site staff.

On May 21, 18 volunteers, spanning from pre-program to professional levels with varying textile experience, broke into production teams. The volunteer teams worked side-by-side with UFS and Alf Engen Ski Museum staff to photograph, assess, label, and fabricate custom protective covers for this unique collection. More than 40 objects were addressed, including vacuuming furs, creating quality, long-term storage solutions for ski suits, and completing condition documentation for a significant representation of the collection.

This project helped provide Alf Engen Ski Museum staff the knowledge to continue to care for this collection for the future. Conservation volunteers gained first-hand experience with a very unique collection, with a museum without conservation staff, and with colleagues outside of their region and direct networks. One of the visiting conservators remarked, "This site and project scope allowed conservators to connect, learn, and teach, all while making lasting connections outside of our day-to-day jobs." Further, ECPN officers were able to successfully plan and execute collaborative programming, typically outside the scope of their career stage. When practitioners and service providers come together to collaborate with a host site on a project, as participants did at the CPP, the potential for growth and learning, meaningful connections between communities and practitioners, success and productivity, and the long term stability of collections is increased.

A comparative practical study to evaluate the impact of the selected Bio and Synthetic polymers loaded with cleaning agents applied for reduction different stains from dyed stained wool fabric

Eman Osman, Heba Saad; Authors: Abdel Rahman El-Srougy, Neveen Kamal, Eman Osman, Heba Saad, Wael Sabry

This study offers comparative results concerning the effect of bio polymer as gellan gum and synthetic polymers as polyacrylamide Loaded with different cleaning agents as protease enzyme and siloxan D5 according to type stain on dyed wool fabric before and after thermal ageing and different periods of application time.

Dyed textiles in museums sometimes are exposed to various types of stains which contributing degradation of fabric and effect on dyes. Using of uncontrolled treatment can cause dye bleeding and shadow lines, therefore, this study presents a practical stain reduction on dyed wool fabric mock-ups using gel poultice cleaning treatment by Protease enzyme and siloxan D5 cleaning materials separately loaded poultices of 2% gellan gum or acrylamide carrier. The protease enzyme poultices target to reduce animal glue stain where siloxane D5 poultices target to reduce the blue ink pen stain.

The main purpose of this practical study to evaluate the efficiency of bio and synthetic polymers loaded with cleaning materials in reducing ink and animal glue stain and characterize changes in red dye of treated wool fabrics before and after thermal ageing through three different periods (zero ageing, 72 hrs and 144 hrs) at 100 oC taking into consideration that, the application of each poultice on the stained samples was tested for different periods of application(30,60,90 min) through different type of analysis methods as color measurements according to CIE lab system. SEM analysis is used to study the surface morphology of dyed fabric before and after treatment. EDX analysis is used to study gel cleaning efficiency by detecting the presence of residues.

You Had Me at Trello: Kanban Style Project Management in Conservation through Four Case Studies

Emma Fritschel, Michelle Leung; Authors: Lucia Bay, Jessica Chloros, Emma Fritschel, Michelle Leung, Katrina Wilson, Deirdre Windsor

Trello is a kanban style project management tool that allows teams to visualize their work. Kanban was first developed in the manufacturing industry and later adapted by the software development industry, where the emergence of kanban boards led to wide applications for project management. Kanban boards generally consist of columns, which delineate steps in a workflow, and are populated by cards that represent work items and advance through the workflow. Four case studies, spanning three specialties and three institutions, will demonstrate how Trello and similar kanban products have great potential for adaptation and use in conservation.

Windsor Conservation was contracted to treat Olga de Amaral's El Gran Muro (1976), a multi-panel large-scale textile wall hanging composed of a woven ground and thousands of free-hanging "shingles" attached to the surface. The treatment process included four stages of mechanical cleaning with suction, chemical sponge, and damp Evolon. An asynchronous and accessible communication and project management system was needed to coordinate the process across a staggered technician team. Trello, accessible through a phone application or web browser, allowed technicians to track the progress of predefined sections through the treatment workflow, note and photograph condition issues, and track time spent per section.

The Isabella Stewart Gardner Museum (ISGM) has a unique mandate that "nothing in the galleries should be changed." To maintain the thirty-three galleries and thousands of objects carefully arranged by Isabella, a team of five Collections Maintenance Technicians cleans artworks one day a week in a rotation that takes 4-6 months. Previously, paper records were kept in a binder and were later entered into a spreadsheet. The introduction of Trello revolutionized how cleaning progress was tracked, assisted technicians in remembering their place week-to-week, stored useful information for returning to galleries in subsequent rotations, and served as a communication method between the technicians.

The 16th-century Italian coffered ceiling painting in the Dutch Room of the ISGM will be cleaned in spring 2025 for the first time in over 120 years. The painting spans 50 m2 with 15 recessed bays. Each bay contains 29 separate painted elements depicting biblical and mythological scenes with decorative floral and fauna motifs, currently obscured by a yellowed surface coating and heavy layers of soot and grime. Trello will be used as the management framework for the treatment and will consolidate archival notes employing multiple numbering

systems for the painted components. The multi-step treatment will take place on public view with a cross-disciplinary team of paintings and objects conservators, and requires a high level of coordination, timing and method of evaluation to ensure a unified result.

Lab and exhibit project management have been improved at the Colonial Williamsburg Textile Conservation Lab through the adoption of Planner, a Microsoft kanban tool. Exhibit boards are populated by object cards that progress through workflow steps (such as treatment, mounting, and photography), visually representing the exhibit components and states of progress. An overarching board tracks progress on loan, exhibit, and other projects that provides a holistic view of the current lab workload.

WANTED: Cleaning Methods for Fugitive Early Synthetic Organic Acid Dyes on the Run

Livi Andreini; Authors: Livi Andreini, Maarten van Bommel, Laura Maccarelli, Ana Serrano

Unintentional dye migration is a critical problem that textile collections and the conservators that care for them are facing. Early synthetic organic dyes (ESODs) include some of the most fugitive dye classes used on historical textiles in collections today and are characterized by their makeup and manufacture throughout the second half of the 19th century.[1] Bleeding dyes can have both aesthetic and structural implications; though impacted textiles are often precluded from traditional treatment methods due to the ongoing volatility of the materials present.[2] Several key case studies have proven the efficacy of removing natural dye migration through aqueous cleaning methods in the form of solvent gels.[3] However, these methods are exclusive to natural dyes that predate the mid 19th century despite the common bleeding problems exhibited by early synthetic organic dyes.[4]

This pilot study – a collaborative effort between the Los Angeles County Museum of Art (LACMA) and the University of Amsterdam (UvA) – presents an investigation into the novel application of gel-based cleaning methods for the removal of unintentional ESOD migration. The project focused on a Chinese Woman's Jacket from the 1920's. The sumptuous silk jacquard woven jacket exhibited severe staining at the armpits, where dyes from the green inner lining had migrated outward onto the surface of the outer pink layer. After confirming the identity of all dyes present using high performance liquid chromatography (HPLC), a variety of traditional and new sustainably-focused gels were tested to deliver a solution that targeted the pH-dependent bond between the fugitive dyes and the jacket's silk fibers. This project considers the ethical parameters of dye bleed removal and works to develop sustainable and accessible methodology for stain reduction. A culmination of expertise across departments, institutions, and regions of the world is represented in this project resulting in an emblem of this year's conference theme about "the power of working with others."[5]

1: J. Barnett, "Synthetic Organic Dyes, 1856-1901: An Introductory Literature Review of their Use and Related Issues in Textile Conservation," Reviews in Conservation, no. 8 (2007): 68-69.; A. Scharff, "Synthetic Dyestuffs for Textiles and their Fastness to Washing," ICOM Committee for Conservation 2, (1999), 656.

2: Barnett, Synthetic Organic Dyes, 1856-1901," 72.

3: A. Smets, K. De Vis, and N. Ortega-Saez, "A Challenging Treatment of an 18th Century Embroidered Textile Using Gel Cleaning in Combination with Decamethylcyclopentasiloxane (D5) Silicone Solvent Barriers," Conservar Património 31, (2019).; K. Sahmel, L. Mina, K. Sutherland, and N. Shibayama, "Removing Dye Bleed from a Sampler: New Methods for an Old Problem," Textile Specialty Group Post prints 22, (2012).

4: Note that early synthetic dyestuffs, known as ESODs, can be found in textiles dating between 1856 and the 1930s, as they were slowly replaced by more stable dyestuffs throughout the early 20th century.; Barnett, 74.

5: "AIC/FAIC: Upcoming Meeting 2025," accessed September 4, 2024.

Thutmose III Mummy Shroud from Storage to Display: Challenges and Collaborative Insights into Preservation and Exhibition

Sarah Ismael, Enas Mohamed; Authors: Safwat Alsayed, Sarah Ismael, Hussein Kamal, Enas Mohamed, Menna Allah Mohamed, Hend Yassin

This study presents a collaborative, multidisciplinary approach to conserving and displaying the high-quality linen Shroud of Thutmose III, which bears a rare section of the Book of the Dead. Traditionally, these texts were written on papyrus, but in this case, they were written on fine linen fabric, dating back to 1450 BC. The shroud will be displayed for the first time at the Grand Egyptian Museum-Conservation Center (GEM-CC) collection, which requires an innovative conservation approach in preparation for its first public display since its discovery. Upon arrival at the GEM-CC, the conservation team faced several challenges. It was attached to old, acidic cardboard, and its large size (4.5 m) made it difficult for conservation and display efforts. These challenges necessitated the development of a conservation strategy for the shroud using the principle of least invasive treatments, drawing on multidisciplinary expertise in conservation and scientific research. Using non-destructive techniques such as multispectral imaging, optical microscopy, X-ray fluorescence, and FTIR, the team could comprehensively assess the properties of the fabric, pigments, and overall condition of the shroud. The results revealed that the manufacturer used yellow Orpiment and Egyptian blue pigments in the upper decorative frame for the writing, and carbon black ink was used for the inscriptions. The analyses also revealed that the old cardboard backing and adhesive used had caused damage to the fabric, resulting in discolouration and darkening of the fabric. These scientific analyses informed key decisions in the conservation process, ensuring the careful removal of the acid support and reinforcement of fragile parts. The conservation team also designed a customized and secure textile mount for the shroud's large dimensions. The innovative use of non-invasive techniques, combined with specially designed and multidisciplinary solutions, ensures the long-term preservation of this unique artefact and its proper display and beauty in the exhibition at the Grand Egyptian Museum. The study highlights the combination of scientific progress and expertise in the field of heritage conservation, demonstrating the power of collaboration in overcoming the complex challenges of studying, conserving, and exhibiting ancient textiles.

Technical analysis of Anatolian Kilims: Bridging disciplines, departments and continents

Callista Jerman; Authors: Maria Fusco, Callista Jerman, Sumru Krody

The Anatolian kilim collection of Murad Megalli, most of which is now at The George Washington University Museum and The Textile Museum, is one of the foremost in the US. Anatolian kilims, particularly those woven by local nomadic tribes, are poorly understood and almost no provenience information is available. Much of the current literature is based on stylistic assumptions, with little to no technical information to confirm. Significant loss of traditional lifestyles in Anatolia means that anthropological research is not feasible, and no written records exist about their original manufacture. Object-based data collection is the only viable option to advance our understanding of these dynamic and graphic textiles.

This collection was chosen as a pilot project to develop a methodology for analyzing textiles in-house at The Textile Museum, using methods that are non-invasive, non-destructive, and can be operated by conservators in the absence of a conservation science department. As permanent staff are unable to consistently devote time to research within the demands of an exhibition schedule, a full-time research fellow position allows the rapid integration of new analytical techniques and equipment.

Now in its second year, this project spans the fields of conservation, conservation science, technical art history, and experimental archaeology and incorporates microscopy, fiber-optic reflectance spectroscopy (FORS), UV/Vis transmission spectroscopy, multiband imaging, and x-ray fluorescence (XRF). A combination of structural and stylistic analysis with more technical information on dyes and mordants has resulted in a new, data-based method of establishing

the age of Anatolian kilims. Consistent information sharing and collaboration between technical researchers and curators and art historians allows for targeted analysis and focuses the direction of the research towards what will be helpful for the end user. Data analysis in RStudio has allowed us to disprove many assumptions previously made about these objects and how their characteristics change over time and space. This project has also allowed the museum to develop connections with other researchers within The George Washington University, to offer research experience for undergraduate chemistry students, and to help train emerging conservation professionals on non-invasive analysis techniques that are increasingly applied to textiles.

Lastly, the results of this research highlight the value of thinking creatively about the resources available to smaller institutions, and adapting the use of analytical equipment to gather data that at first glance requires much more expensive and specialized instrumentation.

When UFOs invade: Displaying unfinished objects

Gretchen Guidess, Jacquelyn Peterson-Grace

The Art Museums of the Colonial Williamsburg Foundation display exquisite examples of needlework, but not every textile in the collection is expertly crafted and beautifully finished. A recent exhibition titled The Art of the Quilterpresented the opportunity to showcase three such pieces ambitious projects that ultimately entered the Foundations collection as UFOs (unfinished objects). The gallery in which large scale, flat textiles are generally displayed consists of large wall cases fitted with slanted boards of medium-density fiberboard (MDF) encapsulated with Marvelseal and covered in dark polyester show fabric. Textiles have previously been hung with headers of hook-side Velcro stitched along the top back edge of the object. The hook Velcro marries well with the coarse, napped show fabric, eliminating the need for custom loop-side Velcro hanging mechanisms. This allows for expedient rotation of objects and offers tremendous flexibility during installation but significantly limits mounting options beyond the traditional Velcro header, a system that is not suitable for all textiles.The three UFOs each required a different approach. A group of 25 appliqud quilt blocks, all square but varying in size, were mounted in the lab before installation. Individual padded boards were created for each block and the textiles were secured with entomological pins. Each padded board was fitted with Velcro tabs on the back, and installation required tiling the boards together on the slant board within the case. To mount 45 fragments of an unfinished pieced-over-paper hexagon quilt top, heavily modified Velcro headers marked with the corresponding accession number were secured with pins to 41 of the fragments. The four remaining fragments were pin-mounted to a single padded board. The fragments were positioned to imply the intended spacing if the quilt had been completed. The third UFO consists of 20th century printed tobacco pouches pieced into a quilt top, many of which retain fragments of paper tax stamps. The lightweight nature of the object and the fragility of the paper fragments limited options for stitching or pinning into the object, so rare earth magnets were used to secure the object to a custom header that included a ferrous metal bar. The magnets were covered and toned to match the textile, and the header was constructed to both facilitate mounting and provide protection and support to the object. These objects, never completed by their makers for whatever reason, provide valuable insight into the art of quilt making. Details that would have been removed or obscured in the final construction, like repurposed pieces of paper or differing bobbin and top thread colors, shed light on the context in which these objects were created and tell the story of their makers. Creative modifications to existing gallery casework and infrastructure allowed for these non-traditional quilts to be safely displayed and ethical considerations about the display of the fragments necessitated collaboration with curators and exhibition designers to strike a balance between honoring the original intent of the maker and expanding visitors' understanding of the art of quilting.

Wooden Artifacts

Unleashing the Evidence: Creating an Interactive Didactic Centered on Conservation-Derived Content

Eve Mayberger

The Museum of Fine Arts, Boston (MFA) has one of the largest and most important collections of Japanese Buddhist sculpture outside of Japan. For five years (2019-2024), the Conservation in Action: Japanese Buddhist Sculpture in a New Light project focused on the examination and treatment of seven large-scale wooden sculptures from the Heian period (9th-12th centuries). Since 1909, a selection of Buddhist sculptures have been displayed in the Temple Room, a gallery designed to evoke the contemplative atmosphere of a Buddhist temple. During the recent project, conservators worked thousands of hours to examine, document, analyze, and stabilize the seven Temple Room sculptures, uncovering new and exciting discoveries and generating many new technical images.

Although the Temple Room aspires to place the sculptures in an "appropriate" context for viewers, it does not attempt to replicate a complete temple environment. One of the MFA's goals was to embrace the space's meditative ambiance by keeping it free of text panels and object placards when the Temple Room was reinstalled. A conservator was invited to join an interdepartmental group with representatives from the curatorial, interpretation, and exhibition media departments to envision what other methods might be employed to better provide contextual information and encourage close-looking of these specific seven Buddhist sculptures. The so-named Temple Room Didactic group partnered with outside collaborator Ideum, a technology company with expertise in creating museum interactives. For a year, the group worked to refine the content of an interactive didactic that was to be placed right outside the central entrance to the Temple Room.

Ideum was responsible for building a custom app that would meet the Museum's interpretative goals and could technically support the different types of data that were slated for inclusion. For example, an opening choreographed sequence shows visitors what one might experience walking into a Buddhist temple complex in Japan and the main landing page displays 3D models of all seven sculptures in a virtual temple environment. The completed didactic encourages self-led exploration as visitors can choose a specific sculpture or opt to read about the sculptures' fabrication. The 3D models can be rotated and are tagged with hotspots that prompt viewers to engage with additional information. In-depth conservation stories are available for three of the sculptures. The didactic includes much more information than can be shared on wall labels and gives visitors a more interactive and exploratory experience.

The Temple Room didactic project underwent several iterations as the group sorted through five years of technical data and images to select content that fit within the didactic framework and was illustrative of the interpretative narrative. The separation of complicated technical stories into short clips that fit within the navigation of a yet-unbuilt app was challenging as it was difficult to envision how the completed interactive would function. The final realized interactive didactic successfully presents conservation-derived information in a digestible manner that reinforces the reverence of these Buddhist devotional figures while highlighting the recent conservation efforts.

How do you fill? How hallway conversations built collaborations for the conservation of wooden objects

Anne-Stephanie Etienne; Authors: Anne-Stephanie Etienne, Eric Hagan, Marie-Helene Nadeau, Fiona Rutka

Since joining the Canadian Conservation Institute, many of my collaborations have taken shape during hallway conversations. When asked the simple question "How do you feel?," I responded off-topic, due to my struggles as a francophone to understand English and my preoccupation with the treatment of a mismatched veneer repair on an 19th century English piano: "I want to fill with wood, but I have several issues…"

The conservation of wooden furniture and objects often requires the integration of new components due to degradation, breakage, or loss. This process

becomes particularly complex when filling large areas with an alternate material. Wood is typically the compensation material of choice, but several factors can complicate the filling process, including the availability of specific wood species and the surface characteristics of colour, grain, and finish. Importantly, there is the challenge of a colour difference developing between the object and the fill after subsequent light exposure. But what is responsible for this – the original wood, the wood fill, or both? Eric Hagan, senior conservation scientist, was kind enough to ask how I was feeling one day, and that conversation led to experiments that address this question. Using customized light ageing boxes and fadeometers, we investigated the colour change response of wood to museum lighting conditions, the influence difference light sources have, and the light dose that changes color slowly enough to be acceptable. Results from our experiments showed that all freshly sanded woods, when exposed to light without UV, undergo a rapid colour change (rated Blue Wool 1 to 3) followed by a slowdown. Experiments on mahogany and purpleheart under LED, Halogen, Fluorescent, and Ceramic Metal Halide sources seem to demonstrate that light source does not have a major influence on colour change. Initially very sensitive, all woods shift to Blue Wool 5 at approximately 50 to 60 MIxh.

Thanks to these key numbers, we concluded that wood used for a fill should be chosen based on its texture and not its colour. Moreover, an object's original wood, depending on its age, exposure, and treatment history, may remain highly sensitive to colour change; mismatches will arise over the course of a conservator's career, requiring re-treatment of the object. Indefinitely removing and replacing adhered wood fills is not a viable option, given the potential for damaging the object. Therefore, I had to rethink my approach to matching the colour of wood fills, which led my feet down the hallway to my colleagues in paintings conservation, Marie-Hélène Nadeau and Fiona Rutka. After testing different natural and synthetic resins, we found that Orasol dyes mixed with Aquazol 200 successfully toned the sealed, light-aged wood fill, and it was easily reversible.

In Between the Layers: Technical Study of a Contemporary Vietnamese Lacquer Painting

Vu Do; Authors: Fiona Beckett, Jiuan Jiuan Chen, Vu Do, Emily Hamilton, Gregory Smith

Leisure Time is a largescale (320cm x 160cm) four-piece lacquer-on-wood panel painting created by Hawaiian-Vietnamese artist Tim Nguyễn in 2008. In just 14 years, the painting exhibited unique discoloration on the surface, with bright yellows turning to dull browns, bright greens fading to dark greens, and oranges shifting to browns. While much information on Asian Lacquer exists, there is limited published research on the relationship between the materials and techniques when used as a painting medium and their degradation mechanisms. In 2023, one panel of the painting was transported from the artist's studio in Hawaii to the Garman Art Conservation Department at SUNY Buffalo State University for research to study the materials, process of painting, and conservation possibilities.

Vietnamese lacquer, known as laccol, is derived from the sap of Toxicodendron succedaneum, a species in the Anacardiaceae family, which also includes the lacquer trees found in Japan, China, Thailand, and Burma. Lacquer is a unique substance that cures only under high humidity conditions through polymerization. While freshly made lacquer is highly durable, aged lacquer films become sensitive to light and sudden changes in humidity. Vietnamese lacquer painting, known as sơn mài, may be described as a form of reverse painting, consisting of as many as 10-20 layers. Lacquer is an art of uncertainty, as each layer can take days or even months to fully cure. By combining the lacquer with various additives, such as oils and resins, artists achieve a wide range of textures. The final image is created by carefully sanding back these layers of paint. In addition to pigments, lacquer artists use playful materials like metal leaves, mother of pearl, and shells to create depth, transparency, and intricate patterns. Traditional restoration techniques often involve using the same type of lacquer; however, these methods are irreversible and tend to age at a different rate than the original lacquer. Moreover, lacquer sap is highly toxic and can cause allergic reactions similar to those triggered by poison ivy.

The current study analyzed the materials and layer structure of the painting, via several analytical techniques. These included multimodal imaging, x-radiography, infrared reflectography, cross-sectional analysis, scanning electron microscopy with energy-dispersive X-ray spectroscopy, x-ray fluorescence spectroscopy, and Raman spectroscopy. Lacquer samples were further analyzed using THM-Py/GC-MS following Getty's Recent Advances in Characterizing Asian Lacquer protocol. Mockup lacquer samples were custom-created, light-aged, and subjected to sea salt in an attempt to replicate the discoloration observed in the original artwork. An artist interview with Tim Nguyễn was also conducted.

The results of the research indicated that photodegradation due to light exposure combined with arsenic-containing pigments was the primary cause of the color changes in the painting. Aged samples also showed the migration of silver ions to the lacquer surface when exposed to light, where they reacted with sulfur-containing pigments forming inclusions on the lacquer surface. In examining conservation techniques, the use of traditional transparent lacquer is irreversible and unstable. It is possible that a modern synthetic varnish may be used as a coating on lacquer paintings. While more study is needed, an initial test of several conservation grade varnish formulations, including MS2A, Regalrez 1094, and Paraloid B72 was conducted and exhibited promising results.

Re-define the craquelure patterns on traditional Chinese musical instrument guqin with advanced imaging techniques RTI and micro-CT

Aidi Bao; Authors: Aidi Bao, E. Keats Webb

Guqin is a Chinese plucked musical instrument with profound symbolic, aesthetic, and socio-cultural meanings. It consists of seven silk strings and a rectangular wooden soundbox painted with multi-layers of Asian lacquer-based coatings. The art of guqin has been inscribed on the UNESCO Intangible Cultural Heritage List since 2003, and the collecting of antique guqin instruments has been an important and active part of Chinese material culture since the eleventh century. Mostly resulting from natural aging processes due to playing and chemical and mechanical deteriorations of the compositional materials, craquelure appears on guqin's surface coatings with time. Interestingly, instead of being viewed as defects or ugly, these craquelures are highly valued as cultural beauty, a sign of authenticity, and a key criterion for appraisal in the guqin collecting tradition. As the connoisseurship of guqin craquelure developed from the eleventh to the nineteenth century, various craquelure patterns were recognized, named, and associated with specific production periods.

However, these seemingly self-explanatory pattern names, such as snake-belly, ice-cracking, and plum-blossom craquelure, have never been clearly defined or illustrated in historical documents or guqin treatises. Although these terms continue to be widely used in contemporary catalogs, auctions, and museum practices, the lack of clarification and in-depth understanding of guqin craquelure patterns has caused issues like arbitrary naming, miscommunication, controversial dating and valuation, and thus puzzling the decision-making of guqin conservation treatments.

This research used non-destructive imaging techniques, including normal and raking light photography, reflectance transformation imaging (RTI), multi-band imaging, and digital microscopy, for over fifteen historical guqin instruments in both public museums and private collections in China and the US. The goal is to document the cracking surfaces at different magnifications and lighting conditions, and segment the most characteristic visual features to re-define and distinguish those traditional pattern names. From this imaging, four comparable attributes are summarized that best differentiate the guqin craquelure patterns in planar: 1) degree of cross-linking, 2) shape and size of networked islands, 3) direction and distribution of disconnected patterns, and 4) formal features of individual cracks. Additionally, we used micro-CT to scan detached coating samples from five historical guqin to study the depth profile of the cracks and fine crackles, the stratigraphic structure of the coatings, and the distribution of the binder and filler in the ground layers. Although often disturbed by later restoration and re-lacquering layers, the micro-CT analysis proved to help study the more complex areas and distinguish craquelure patterns developing top-down that were potentially initiated by light damage, versus patterns developing bottom-up that were more likely caused by mechanical stress in between the wood substrate and the coating.

We hope the results of this ongoing project can contribute to building a more

scientific classification system of guqin craquelure and clarifying its crack-forming mechanism, which ultimately could improve current restorative and preventive conservation practices and bring more attention to the understudied category of East Asian musical instruments in the context of global collecting and cross-cultural conservation.

Furthering Conservation in Wartime Ukraine

Yuri Yanchyshyn

Russia's invasion in February of 2022 of Ukraine dramatically altered the cultural as well as the physical landscape. Numerous Ukrainian conservators scrambled to protect their cultural heritage, while others left the country as refugees. Western conservators and conservation scientists, conservation organizations, non-profits, and foundations responded to this event with fruitful initiatives to assist in these preservation efforts and to prevent a now well-documented existential threat to Ukrainian culture. This presentation will focus on the collaborative efforts of Ukrainian conservators, conservation educators and scientists, art historians, translators, university faculty members, historic preservationists, and their peers and concerned parties outside of Ukraine. The perspective will be of an AIC Wooden Artifacts conservator, Fulbright Specialist, and Scholar to Ukraine before the war. It will illuminate the will and determination of Ukrainians to acquire and implement the conservation knowledge and values of the West under challenging circumstances.

Posters

01 Study and conservation of archaeological glass dish from the early Islamic era extracted from the excavations of the American Research Center in Fustat, Egypt

Mohammad Abdelkarim

The Presentation discusses a special case of an archaeological glass object from the early Islamic era that was extracted from the excavations of the American Research Center in Fustat, Egypt, in 1966.

The glass dish appears to be made up of two layers of glass, but this is not true. However, this appearance required studying the reason, and we find that the glass object has glass corrosion and that part of the glass layer has fallen off and is missing, which makes the shape of the object appear to be made up of two layers of glass.

When we see the shape of the glass corrosion on the object, we find that it is consistent, except for some places on the object that appear black as spots. This necessitated a study to identify the reason for the difference in the shape and color of these places. SEM with EDX were used to identify this reason and to study the components of the glass dish. A USB Digital Microscope was also used to examine the surface of the glass dish, including the glass corrosion, as well as the places of the fallen parts on the dish, which confirms the presence of fallen parts of a layer of glass.

When the glass dish was discovered in the excavations of the American Research Center in the late twentieth century, it was found to be broken to many parts and there is a missing part, so it was previously restored. However, recently, parts of the creature were found to be separated from the previous conservation, and there was a space between its assembled parts. UV photography was used to identify previous conservations, as well as a sample was taken from the material of the previous assembly and analyzed using ATR analysis, and it was identified. The previous assembly was disassembled and reassembled the object, the previous yellowed consolidation material was cleaned and removed, a consolidation material was applied to the corrosion glass parts of the object, and Paraloid was used for the consolidation, and the glass plate was preserved in a storage box that was specially made for it from acid-free cardboard.

The glass of the dish is transparent and has decorations, and therefore these decorations do not appear clearly except at specific lighting angles. These decorations were identified specifically and drawn using Adobe Illustrator, and the shape of the decorations for the missing part was also imagined.

It is worth noting that this archaeological glass dish was participated in one of the temporary museum exhibitions after it was studied and restored.

02 The nanotechnology technique and its use in cleaning and consolidating the mural paintings

Meriette Azmy

The stone antiquities represent the largest percentage of the total antiquities found in Egypt which are represented by tombs , temples , pyramids , statues, and others and the inscriptions writings and mural paintings they carry of great importance therefore it is necessary to study them well in terms of knowing the type of stones , their nature , the wall pictures found in them and their components studying the factors and manifestations of damage affecting them , and the best modern methods that can be used in their restoration in order to achieve the best results to preserve this important and rare world heritage . in this research we will discuss the latest of these methods, which is the use ofnanotechnology in restoration which is one of the latest technologies used recently in various fields and then in restoration due to its extreme accuracy and because it is safer . we will discuss its application and show its results on some very important and distinctive wall painting that were found in the tomb (KV20) of Hatshepsut and the tomb (KV38) of Tuhuthmosis II . they date back to the early era of the 18th dynasty which represents the first and primary source for the book (Amy-Dawat) which is theoldest royal book regardingthe other world .

03 An Overture of Past and Present Conservation Challenges: Straits Settlement Police Band Scores

Sanira Karim Gani, Tay Jam Meng

The Straits Settlement (S. S) Police Band music scores collection was donated to the National Archives of Singapore (NAS) by the Republic of Singapore Police Force Band in 2016. It was a historically significant collection whose roots go back to the first local regimental band in Singapore (1925-1940s) during the British colonial office period, before it was renamed the Singapore Police Force Band, and continues to be known today. These 215 scores of western compositions were arranged for band music as the scores excluded string instruments. They were published across the 18th to 20th century, with the majority in the 1900s. The single and multiple-folio scores were printed primarily with carbon black ink on wove paper and ink-stamped with 'S. S Police Band', alongside with other handwritten media such as graphite pencil, coloured pencil, ballpoint pen, technical pen, and iron gall ink. Some of these markings revealed the multiple users over time.

The project started with a condition survey in 2018 involving four conservators from NAS' Archives Conservation Lab (ACL). They set out to propose the conservation treatments, housing storage solutions and time required to conserve the entire collection. The overall survey report revealed that the collection was mainly in poor condition with Condition Rating (CR) range between two to five based on ACL CR's scale of one (very good) to five (unacceptable conditions). Apart from tears and losses, the degradation of pressure-sensitive tape and adhesive labels applied by the user in the past rendered some items vulnerable to potential chemical deterioration. The comprehensive survey report and database enabled ACL to begin the challenging project by first selecting three scores assessed as CR4 and CR5 for conservation treatments, 'Paraphrase– 'Loroley' by Nesvadba, 'Plymouth Hoe–A Nautical Overture by John Ansell and, 'Kissing Time' by Ivan Caryll, in 2022. With treatment and technical complexities, the team worked together to discuss the treatment options to balance viability and preservation needs.

The Singapore Police Force Band project catalysed an opportunity for the conservators to deep dive into adhesive tape resulting from treatment experience, by embarking on an in-house tape removal training programme for the team to learn and conserve the rest of the scores. It further developed into a collaborative effort with NAS' Sound and Moving Image Laboratory (SMIL), which handles audiovisual archives, in creating tape samples. The methodology used a climatic chamber to carry out accelerated aging of the different tape varieties to simulate their conditions found on the scores with complex tape issues. This approach helped to create realistic sample case studies for the team to practise and learn from. The project explores different considerations when embarking on challenging conservation treatments, from decision-making to formulating practical, sound and applicable conservation treatment proposals. It will also highlight the importance of building capacity for the conservators through immersive training, widening our knowledge by researching into the rich heritage of Singapore, and the invaluable process of collaboration with colleagues.

04 Bridging Preservation and Digitization: Collaborative Approaches in Remediating and Preparing Folk-Legacy Records for Long-term Access

Hannah Rose Baker, Julia Hawkins, Caroline Mulligan, Dave Walker

This presentation will explore the collaborative effort between the Smithsonian Institution (SI) and the Northeast Document Conservation Center (NEDCC) in preparing the Folk-Legacy Records Collection for digitization. Folk-Legacy Records was a folk recording label founded in 1961 by Sandy and Caroline

Paton and Lee Haggerty. Active for nearly 50 years, the label released over 140 albums of traditional music. Their archive spans 205 cubic feet and consists of a wide range of materials, including research notes, business records, film and photographs, and recordings on open-reel tapes, cassettes, and CDs. Smithsonian Folkways Recordings received the collection in 2019. Prior to its acquisition, it had been stored primarily in the Patons' home recording studio in Northwest Connecticut, where it was subject to a wide variety of environmental conditions. Faced with contamination from pests, mold, and debris, the project required a two-pronged approach: collaboration between SI and NEDCC, and interdepartmental teamwork at NEDCC, involving audio and imaging specialists.

We'll discuss the initial condition assessment, NEDCC's proposal process, and the development of a remediation plan. The dialogue between NEDCC and SI throughout the project was essential to tailoring the preservation strategy to SI's needs and the needs of the collection materials. Work at NEDCC was performed primarily by two departments: the Audio Department oversaw the remediation of the open-reel tapes and cassettes, while the Imaging Department dealt with the papers, photos and film, and electronic media. Along with returning the collection in a state where it could be safely integrated into the Smithsonian Institution, NEDCC delivered a folder-level inventory detailing the contents of each container.

This presentation will reflect on both the strategies used to remediate the collection, and the strategies that NEDCC used to ensure a final product that consistently reflected the wide variety of materials within the collection. Finally, we'll reflect on the lessons learned from this vendor partnership and offer strategies for institutions seeking to engage with specialized vendors for large-scale archival preservation, particularly for non-emergency disaster recovery services.

05 The Mysterious Flecto: Investigating a Historic Treatment Material

Jennifer Bridges, Lindsay Cross, Ainslie Harrison, Skyler Jenkins, Leila Sabouni

Conservators at the Virginia Museum of Fine Arts (VMFA) recently came across a mysterious treatment material referred to as "Flecto" while they were re-treating a number of enameled jewelry and decorative arts objects in the collection. This material was used at the VMFA most frequently as a tinted fill material on damaged enamelwork. A search of the conservation literature returned almost no references to Flecto, which is the name of a company that produced paints, wood finishes, and floor coating systems until they were purchased in 1998 by Rust-oleum. Fortunately, a photocopy of an original product label was present in one of the object folders, revealing the full product name to be "Flecto Seamless Clear Plastic," an acrylic resin in xylene. As a substantial amount of decanted "Flecto" remains in the lab's chemical storage, additional analysis and accelerated aging tests were carried out to more fully characterize the material and its aging properties and to determine the potential long-term effects on the objects treated. A survey was also sent out to the conservation community in order to gauge how frequently and in what contexts this product has been used in the conservation field. We hope the results of this study will prove useful to other conservators and museum professionals who come across this historic conservation material.

06 Book speaks volumes: Micro computed tomography of Mary Stuart's prayer book binding

Anna Kowalewska

When the prayer book of Mary Stuart, Queen of Scots was delivered for conservation a question was raised if the binding of the prayer book can be restored to open it more easily, so that the sewing wouldn't cause distortion of the vellum and misplaced pages could return to the proper location. I wanted to apply as many non-invasive tests as possible before physically touching the precious book itself and for this reason I decided to focus on computed tomography (CT) imaging.

My project benefits from collaboration of art conservation and nuclear physics similarly to patient-hospital relations through a harmless evaluation of the condition. Application of CT in bookbinding restoration is still very rare or non-existent and this project is pioneering. The goal was to develop CT imaging as a standard tool to diagnose and solve bookbinding restoration problems.

Most of the historical books have lost their original covers over the years or were rebound multiple times. CT imaging can offer real visible answers as to the original book structure instead of guessing them by the time and place of the book origin, never compromising the safety, allowing to verify and justify planned restoration procedures.

First CT scans were performed on a medical scanner at the hospital. Depending on the scan viewing program, different structures of the bookbinding were revealed but I needed a better resolution like the one of micro CT to distinguish the sewing thread course.

Micro CT scans were performed at the university, scanning the book spine took significantly longer but yielded great results.

The scan, although at first puzzling, exposed the true condition of the book after its 18 century rebinding - the pages' spines were gone and needed a complete reconstruction to allow easy opening of the manuscript. Marks discovered on the book spine were interesting suggestions of the probable original 16 century binding. Also, they enabled me to precisely estimate the amount cut off from the edges of the prayer book.

CT has proved immensely useful as a pre-renovation book binding analyzing tool. Both methods - medical CT and micro CT have revealed various binding structures invisible to the naked eye. Medical CT scans are faster to perform, and can uncover different complex layers depending on which viewing filter is applied. Designed to show human organs in detail, they treat the book as such allowing it to peel off every layer, and show every tissue.

When searching for the specific and minuscule detail, micro CT proved much more accurate though. In the bookbinding it meant I could observe the sewing thread course, even if it was hidden deep in the spine or covered with a thick layer of glue or lining. Understanding the makings of a binding without touching or compromising the valuable object is a priceless opportunity. Developing micro CT scans as fully operational bookbinding diagnostic tools will be an immense asset in the conservation process.

07 Developing Conservator: My Journey in Darkroom Photography

Sophie Church, Theresa J. Smith

In the field of art conservation, understanding of an artist's chosen materials and their creative application is fundamental. This holds true for photograph conservation, where a profound grasp of the historic evolution and chemistry of photographic processes is crucial for discerning and identifying each technique. However, deeper learning is achieved through hands-on engagement in the darkroom. Delving into the intricacies of photographic processes not only unveils the technology, tools, and chemistry underpinning their production but also serves as an invaluable experiential learning tool. Darkroom practice enables observation and critical thinking about a photograph's evolution from its initial creation to potential display, and how these factors influence its long-term preservation. It also facilitates an understanding of the differences between genuine deterioration and intentional alterations made by a photographer. Creating photographs in the darkroom can combine research into the history and chemistry of photography with research into photographers, studios, and businesses utilizing these techniques today. The sensitivities of different emulsions can also be experimented with and observed. The addition of toners or other chemical baths in the darkroom can be understood by seeing the change in color of a print and its stability over time. This immersive exploration equips conservators with a dynamic perspective that informs their decision-making in the outreach, preservation, and treatment of photographic materials. When creating albumen prints for example, the paper curls at all stages of production from the first application of the egg-salt mixture to the final wash bath. This demonstrates the inherent qualities of these prints and though we may consider curling damaging and work to keep the print flat, it

is also an unavoidable part of the making process. While striving to maintain flatness, historically, albumen prints would be mounted to a paper board. This mounting process, though keeping the print from curling, could potentially introduce cracking in the emulsion over time. The tendency of the print to curl and potential cycles of curling and flattening demonstrate its sensitivity to moisture and the need for a stable environment and safe housing for long term preservation. Additionally, through making albumen prints, the similarities to the salted paper print process are clearly identifiable. The recipes for chemical baths and steps in the darkroom are nearly equivalent. It is understandable why their identification might be challenging. Finally, the darkroom also serves as a platform for outreach, where sharing the art and science of photography through workshops and social media can enhance public understanding and appreciation of art conservation. This is increasingly important in an era when images are so easily captured, duplicated, and distributed.

08 Stuck on You: An Experiment in Separating Oil-based Printing Ink from Acrylic Glazing

Frances Opferman, Samantha Sheesley

Objects stuck to their glazing (or other materials) is not an uncommon problem in conservation. However, much of the literature regarding adherence to glazing focuses on photographs stuck to glass, and there is little to be found highlighting other circumstances. Thus, when tasked with separating thick oil-based printing ink from acrylic glazing, experimentation with novel removal techniques was required.

Untitled (1983) by David Engel, in the collection of the Virginia Museum of Fine Arts, is an abstract etching and linocut on heavy wove paper. The linocut component consisted of several thick and textured layers of oil-based printing ink. Untitled had been float mounted with wide margins onto a backing board and framed without a window mat or spacers to hold the acrylic glazing away from the media, resulting in parts of the topmost red ink layer becoming adhered to the acrylic. Raking light photography emphasized the areas of the ink that were stuck.

A mechanical method was deemed the safest avenue for removal, due to the possibility of microcracks forming in the acrylic when exposed to solvents and since the margins surrounding the print made the media inaccessible for testing. As removing the print in pristine condition was highly unlikely, the primary goal of treatment was to remove the print with the least amount of media loss possible.

To try different removal techniques and determine how best to release Untitled, I created linocut mockups and used acrylic glazing to recreate the conditions of Untitled as closely as possible. I tested several mechanical methods of separating my mockup prints from their acrylic, including (careful!) brute force as a control, humidification, and temperature modification. All the mockups were removed with a microspatula, using a gentle twisting motion near the stuck ink. The results of these approaches can be illustrated through images and micrographs.

My testing showed that freezing the entire mockup was the most successful method. Using a chest freezer, I froze Untitled and removed it from the acrylic slowly, over the course of several days. The largest adhered areas were less responsive to my microspatula technique, so after testing a few more frozen mockups, I found a mat cutting blade very effective for separating the remainder of the ink from the acrylic while Untitled was still frozen. These techniques resulted in a freed print in very good condition; the few areas of loss that occurred during the removal process were easily reattached or filled and inpainted. After treatment, there was virtually no visual evidence that the print had been adhered to its glazing.

Though the materials and condition of an individual object affect the feasibility of freezing, these experimental results provide a new technique to consider for the separation of hydrophobic media stuck to acrylic glazing.

09 Shedding Light on the Color Sensitivity of Glass Beads

Cheyenne Caraway, Ellen Carrlee, Devon Lee

With the exception of risks related to physical forces and moisture-induced deterioration and crizzling, glass is generally considered to be among the least sensitive materials in the museum environment. Collections care resources used by conservators and cultural heritage caretakers categorize glass as insensitive to light, and current lighting recommendations for the display of beadwork are made with regard not to the beads themselves, but to the typically organic backing materials to which they are affixed.

In 2024, the Alaska State Museum (ASM) initiated a collaborative effort between beaders, culture bearers, and ASM staff with the goals of expanding access to the beadwork held at ASM; developing culturally appropriate conservation protocols for the preservation of beadwork originating with the Alaska Native communities represented in the ASM collection; and ultimately producing a collaboratively curated ASM exhibition of beadwork. In the preliminary stages of launching this collaboration, J. Kae Good Bear, a beader and museum professional, mentioned to ASM conservator Ellen Carrlee that she had observed beadwork with apparent color loss in museum collections. That some beads are vulnerable to color fading has since been verified anecdotally by other beaders and through examination of beadwork in the ASM collection, but this phenomenon has not yet been fully characterized or brought to the attention of the conservation profession. Loss of color in beadwork is concerning for several reasons: foremost, it disturbs the highly intentional and significant color choices of the beader; it also challenges conservators' understanding that with the exception of the discoloring solarization of some glasses that can occur after prolonged exposure to high-intensity UV radiation, glass beads do not experience color change.

This poster describes preliminary research related to glass bead color loss. Many glass beads—especially modern beads, but some historic varieties as well—are colored with coatings or paints to reduce manufacturing costs and to achieve hues that cannot be easily produced with glass chemistry alone. This investigation identified three modes of color damage to which beadwork in museum collections may be susceptible: (1) fugitive dyes and colorants in coatings and paint media can fade with exposure to light, leaving behind a white, grey, or colorless binder; (2) some coatings and paints can be easily abraded or scratched, exposing colorless or colored glass; and (3) some bead colorants are soluble in common solvents including acetone, ethanol, and water. The latter form of color loss is particularly concerning, as water and ethanol (mixed or in isolation) are the two solvents that are currently recommended and most commonly used by conservators for cleaning glass beads. Clearly, further investigation is warranted.

This poster aims to amplify and corroborate the insights of beaders, among whom the notion of bead color loss is already relatively common knowledge; to highlight the criticality of collaboration between conservators and allied professionals, artists, and culture bearers; and to invite members of this field to be in touch and share in the larger ongoing ASM efforts to develop improved guidelines for the stewardship of beadwork.

10 Can turning off air conditioning systems still keep museum collections safe?

Yan Chen Lin, Chien-Shan LU, Wei-An Wu

Museums serve as essential institutions for preserving and displaying human history and civilization, with strict control of temperature and humidity traditionally seen as a cornerstone of collection care. However, as global discussions around climate change and energy conservation intensify, museums are increasingly recognizing their responsibility to contribute to environmental sustainability while continuing to safeguard their valuable collections. CHIMEI Museum, situated in the subtropical climate of Taiwan, has long adhered to a 24-hour air conditioning system to maintain optimal environmental conditions for its collections, resulting in substantial energy consumption. The air conditioning system alone accounts for 40% to 60% of the museum's overall energy use.

Responding to the mounting pressure to reduce energy costs and carbon footprints, CHIMEI Museum has embarked on a significant journey to optimize its energy usage without compromising its collections. This endeavor, which began in 2014 when the museum relocated to its current site, is a testament to the collaborative spirit of the museum's collections manager, conservator, and air conditioning engineer. Together, they initiated a series of energy-saving measures, including raising the temperature set point from 22±2°C to 23±1°C in 2015 and further to 23±2°C in 2018. This gradual shift marked the first step toward balancing energy efficiency with conservation needs.

In 2021, CHIMEI Museum took its energy-saving efforts to the next level with an innovative strategy. The museum adopted an intermittent operation mode during non-operational hours (19:00–07:00), where fourteen air handling units were successively set to operate at reduced frequencies (from 43Hz to 30Hz) and follow a cycle of 45 minutes off, followed by two hours on. By 2023, this forward-thinking approach resulted in approximately 3.5% energy savings in one year. Throughout these adjustments, conservators closely monitored critical works of art, ensuring that no adverse effects on the artworks were observed.

Monthly meetings between the museum's collections manager, conservator, and air conditioning engineer have been essential in fine-tuning the Supervisory Control and Data Acquisition System. During these meetings, temperature and humidity data from the galleries were meticulously reviewed, and adjustments were made to ensure that environmental conditions remained within acceptable parameters for the collection's preservation.

Throughout this period, conservator continuously monitored a 12th-century Catalonian wall painting near the exhibition entrance and a 1924 oil painting on canvas by Moïse Kisling in a distant gallery to ensure no harmful changes occurred, the original cracks have not significantly expanded. Given the success of these initiatives, CHIMEI Museum plans to expand these energy-saving practices to other galleries in the near future. This initiative represents a sustainable model for museums worldwide, balancing the dual priorities of environmental stewardship and cultural heritage preservation.

11 The Application of Forensic Imaging Technology to the Field of Cultural Heritage using the Crime-lite® AUTO

Minyoung Kim, Jessica Pace, Lindsey Tyne

The Crime-lite® AUTO (Crime-lite) is a full-spectrum forensic imaging camera developed by Foster + Freeman Ltd. for crime scene investigations. The Crime-lite captures images between 350 – 1000 nm using repeatable parameters with nine internal LED illumination sources (ultraviolet 365 nm, infrared 860 nm, visible light, and six color-specific visible light wavelengths) and nine internal filters (365, 415, 530 nm bandpass; 420, 455, 495, 550, 590, 780 nm longpass). The illumination sources and filters are controllable by a touchscreen interface to create 55 combinations. The Barbara Goldsmith Conservation & Preservation Department at New York University Libraries purchased the Crime-lite to fill a need for efficient and repeatable non-visible light image capture by non-imaging specialists.

We explored the Crime-lite's capability to create multi-band images (MBI) typically used in the cultural heritage field by producing MBI sets using three setups: 1) the Crime-lite with internal illumination sources and internal filters; 2) the Crime-lite with external illumination sources and internal filters; and 3) a modified DSL (Canon Rebel XSI) with external illumination sources and external filters. Each MBI set consisted of six images (Visible light image (VIS), Ultraviolet-induced visible fluorescence image (UVF), Ultraviolet-reflected image (UVR), Infrared-reflected image (IRR), False color UV image (FCUV), and False color IR image (FCIR)) of the same commercial standard imaging targets and a mock-up of blue pigments and drawing media. The same external illumination sources were used with the Crime-lite and modified DSLR for image sets 2 and 3 to facilitate comparison. However, the filters were specific to each camera; the Crime-lite's internal filters and five external filters (X-Nite CC1, X-Nite 330 C, X-Nite 850, Peca 918, Tiffen 2e) added to the lens of the modified DSLR.

When operated with internal and external illumination sources we found the Crime-lite produced comparable MBI sets to the modified DSLR. Additionally, we easily captured visible-induced infrared luminescence (VIL) images to detect Egyptian blue, as well as color contrast images, using the internal illumination and filters of the Crime-lite; two imaging types we could not capture with the modified DSLR and illumination sources we had available for the study. The largest difference we observed between MBI sets captured by the Crime-Lite and modified DSLR was when we compared images across cameras, however, both cameras produced usable reference images. Images captured with the Crime-lite have associated metadata recording illumination, filter, and camera settings which is a benefit to the user when documenting their imaging parameters.

Key advantages of the Crime-lite are its efficiency, portability, ease of use, high image quality, and repeatable parameters for image capture. The user-friendly interface and the integrated controls for both illumination and filter changes allow for the capture of common MBIs used in the cultural heritage field (VIS, UVF, UVR, IRR, VIL) in under ten minutes with minimal training for the user. This makes the Crime-lite a pragmatic alternative to the typical modified DSLR MBI capture workflow and a welcome addition to our documentation tools.

12 Frederick Carder's Aurene Glass: Historic Background and Physical-Chemical Description

Annika Blake-Howland, Doris Möncke

Frederick Carder (1863-1963) was a noted glass designer who cofounded Steuben Glass Works in Corning, New York, with Thomas G. Hawkes in 1903. In this period Carder also developed a golden, iridescent glass he named Aurene, inspired by the appearance of weathered Ancient Roman glass where the glass surface was modified over hundreds of years due to water exposure in a burial environment. This paper will discuss the complex historic manufacturing process of Aurene and the preliminary findings of a study to investigate the surface and body of the glass.

Prior to cofounding Steuben, Carder previously worked with John Northbridge and as a designer at Stevens & Williams, where he helped reintroduce colored glass to the firm. It is likely that Carder began to explore concepts related to the glass that he would later name Aurene during his time at Stevens & Williams. Carder developed a method for creating an iridescent effect in a leaded soda lime silicate glass and submitted a patent for the gold iridescent glass Aurene on September 6, 1904. In 1905 Carder, through Steuben, debuted a line of blue Aurene decorative glass objects. Although other glass designers were creating iridescent glass at the same time, Frederick Carder's process had only minimal overlap with the processes used by these other designers.

The process for creating an Aurene object is complex and contains several steps. Frederick Carder was known to be significantly secretive about his glass compositions and processing, but he also made significant notes and recorded observations in his personal notebooks. Carder's Aurene glass for production was a soda lime silicate glass with added oxides of silver and nickel. This base glass was melted, and the object was then blown under reducing conditions, creating an exterior layer of reduced metal oxides. Next, the object was sprayed with tin chloride and heated in an oxidizing flame to produce the iridescent effect. All of these steps were done fully by hand, so the evenness of the metal oxide layer, the deposition of the tin salts, and the evenness of the exposure to the oxidizing flame were all the product of the skill of the glassblower creating the object.

This complex, multistep process creates a glass that has compositional differences across the bulk and surface. While Carder's Aurene glass has been written about numerous times from an art historical perspective, scientific investigations of the glasses are difficult to find. Samples of gold Aurene glass were investigated though spectroscopic techniques, including x-ray fluorescence (XRF), scanning electron microscopy with energy dispersive spectroscopy (SEM-EDX), Raman spectroscopy, and Fourier transform infrared spectroscopy (FTIR). Through these studies the authors were able to begin to form a picture of the structure and composition of the Aurene glass, with a strong focus on the differences between surface and body. Finally, future work will be discussed, including recreating some of Carder's Aurene compositions and techniques with a particular focus on furnace conditions.

13 The Value of Rejection: Embracing Discarded Materials - Assessing the Potential of In-House Cellulose Nanofibers in Paper Conservation

Hsuan-Yu Chen, Tsang-Chyi Shiah

Pursuing environmental sustainability has been a continuous consensus in the museum sector since the 21st century. In line with this, our museum has sought to apply bio-based materials developed by academia in conservation work. In this case, the collaborating unit is the College of Agriculture at National Chiayi University in Taiwan, which has utilized the TEMPO method to produce cellulose nanofibers (CNFs) from pineapple leaves and bamboo stems. These plants, commonly used in East Asian papermaking, offer high compatibility with paper and are characterized by their rapid growth, wide distribution, and low cost in Taiwan's subtropical climate. If developed under conditions that prevent raw material depletion and reduce the carbon footprint, they could have significant potential for growth. This study evaluates the effectiveness of these CNFs in reinforcing paper structures during university students' internships at the museum and assesses their stability for conservation purposes.

To standardize the testing process, this study used an airbrush to evenly apply a 1% CNF solution onto filter paper and deteriorated paper, followed by a two-phase testing procedure. The first phase involved testing different numbers of spray applications (1-3 times) to assess the impact of the number of applications on paper properties. In the second phase, the most effective number of spray applications from the first phase (3 times) was used to compare the reinforcement effects of the in-house CNFs with a commercially available product, evaluating their competitiveness and potential for substitution. The completed spray samples underwent analysis of physical, chemical, optical, and structural properties, including color difference, whiteness, glossiness, pH, folding endurance, tensile strength, basis weight, contact angle, FTIR, and SEM. Additionally, the durability of the in-house CNFs was evaluated after aging.

The current test results indicate that the in-house CNFs effectively penetrate the paper structure and strengthen its physical properties. The optical properties show minimal changes in paper color, which aligns with the needs of paper conservation. However, compared to a commercially available, well-developed CNF product, there is still room for improvement. A 1% concentration of in-house CNFs achieves effects similar to those of a commercially available product with just a 0.06% concentration due to differences in refinement and manufacturing methods.

Throughout the research process, we observed the feasibility of academia-industry-government collaboration. With industry cooperation, the university could obtain agricultural waste (pineapple leaves) and bamboo from local farmers near the campus at no cost. In the educational process, students from the College of Agriculture were able to engage directly with the plants through harvesting, gaining a closer understanding of plant characteristics and exploring applications for CNF development in their coursework. The museum's involvement has created practical demand, allowing the teaching materials and products from the course to be put into practice and refined. Looking forward, we hope that further testing and improvement by both the university and the museum—key aspects of our research—will enable these potentially valuable waste resources to be effectively reused under environmentally friendly conditions to develop higher-value applications while encouraging future collaboration and development in the field.

14 Innovating Cultural Heritage: Modified Smartphone Multispectral Imaging for the Pigment Analysis of Roman Egyptian Soter Shrouds

Sean Billups, Rachel Coderre

This joint talk will present findings from a collection of 28 fragmentary funerary shrouds and two cartonnage pieces from Thebes, Egypt. These artifacts, known as the Soter shrouds, date to the 2nd century A.D. and represent a significant example of Roman Egyptian funerary practices. This study employed modified smartphone multispectral imaging techniques to explore the pigment compositions and artistic techniques utilized in these textiles, revealing previously unseen details and offering a deeper understanding of their production and cultural context.

Multispectral Imaging (MSI) is a powerful analytical tool used in cultural heritage conservation, although traditional setups are often prohibitively expensive and inaccessible to smaller institutions and conservators. To address this issue, Sean Billups developed a modified smartphone MSI system, which provides a cost-effective, portable alternative. This cutting-edge technology retains the capabilities of traditional MSI techniques while making advanced imaging more accessible.

At the heart of this research lies a collaboration between two MSc students at Cardiff University: Rachel Coderre and Sean Billups. Due to the lack of traditional MSI equipment available to them, Billups' unique modified smartphone system was adapted and expanded upon, enabling Coderre to apply these techniques to the Soter shrouds. This collaborative approach bridged expertise in imaging technology and conservation research while pushing the boundaries of MSI imaging.

The imaging results provided new information regarding the materials and manufacture of the Soter shrouds. The presence of organic pigments like madder lake was confirmed, and the distribution of Egyptian blue, a pigment known for its distinctive luminescence, was mapped. Partial luminescence revealed evidence suggesting potential over painting and pigment mixing, a technique previously identified in Roman Egyptian art. These findings point to the scope of pigment mixtures and suggest a diagnostic framework that could link Soter-related artifacts across museum collections worldwide.

The range of imaging methods revealed subtle similarities in patterning and pigment application across various shroud fragments, suggesting a potential connection in production methods and the possible involvement of multiple workshops. These findings contribute to a more nuanced understanding of the artistic practices and potential trade networks associated with Roman Egyptian funerary textiles.

Our project highlights the potential for innovative and accessible technologies to drive advancements in cultural heritage research. By expanding the use of MSI into under-explored areas, we aim to make previously inaccessible analytical tools more widely available. This breakthrough presents an attractive option for institutions and private practices seeking to maximize impact with limited resources. Beyond advancing our understanding of Roman Egyptian funerary textiles, this work paves the way for future research, utilizing affordable, innovative techniques that push the boundaries of traditional research methods.

15 Pew! Pew! Testing A Novel Application of Neodymium-doped Yttrium Aluminum Garnet Lasers in Asphaltic Paleontological Preparation

Stevie Morley, Vadim Parfenov, Stephany Potze

La Brea Tar Pits in California is the world's richest Late Pleistocene (55 kya - 10 kya) fossil locality and an International Geoheritage Site. Renowned for its abundance of specimens and excellent preservation resulting from asphaltic taphonomic conditions, the Rancho La Brea (RLB) collection has a substantial representation of biological material. Only 14 fossiliferous asphaltic deposits are known globally, making preparation of such paleontological specimens highly specialized. RLB's Fossil Lab is the only facility in the world skilled in large-scale preparation and conservation of asphaltic fossils.

Asphaltic fossil preparation is a chemical technique, requiring degreasing solvents to remove matrix of hardened asphaltic sediment. Current preparation protocol at RLB uses manual application of small volumes of solvent, Novec 73DE, in targeted areas of adherent matrix, softening the asphalt and loosening sediment for gentle separation from specimens. Manual osteological specimen preparation is routine, but preparation of arthropod and botanical specimens requires further study.

Lacking archived preparation records at RLB, there is no available data regarding past methods for arthropods or botanical materials. In a preliminary trial,

manual preparation of arthropods with Novec 73DE demanded a highly controlled application of solvent to prevent over-saturating matrix surrounding the specimen, and disassociation of articulated elements. The mechanical effort required to remove stubborn matrix could lead to damage.

The fragility of these materials and complications arising from solvent preparation suggested investigation of a contactless preparation method. While the use of neodymium-doped yttrium aluminum garnet (Nd-YAG) lasers is becoming increasingly common in conservation fields, its application for the removal of surface asphaltic matrix from fossil arthropods and botanical material is novel.

16 (Re)constructing the Plaster Print: Tracing an Elusive History

Lisa Conte, Lucia Elledge, Emily Jenne

Plaster, as a material, has been used for centuries in diverse practices, from casting multiples to creating sculptural forms. This project focuses on plaster prints—works that are singular in their uniquely carved and painted surfaces and multiple in their inextricable relationship to printing matrices. Historically, plaster prints were used to proof or create impressions without the need for a press. Atelier 17, an innovative printmaking studio that was active in Paris and New York in the mid-twentieth century, significantly expanded upon the plaster printing technique. Artists such as Stanley William Hayter, John Ferren, and Anne Ryan worked in this medium, carving and painting their prints after the initial impressions to produce unique works of art. Hayter, who was the founder of Atelier 17, and his contemporaries emphasized that they were not inventing new techniques but rather building on existing ones in a collaborative and experimental environment. Plaster prints have largely fallen into obscurity today, complicating their connoisseurship and preservation. Using reconstruction as our primary method, our project aims to highlight the materials and techniques originally used in the creation of these prints, which can support our understanding of and care for the extant oeuvre of plaster prints created at and around Atelier 17. Our work benefitted from collaboration with art historians, artists, and paper and objects conservators. Bringing insights from these various fields of expertise, we hope to revive interest in this technique, making it accessible to a new generation of artists while underscoring the important contributions of the Atelier 17 printmakers.

17 Considering Soy-mal-tan: a preliminary examination of a sustainable high-strength adhesive and its potential application to metals conservation

Karl Knauer

Ongoing developments in bio-based materials can potentially provide innovative alternatives as the field of conservation seeks sustainable options. In 2023 the journal Nature published research by chemists at Purdue University who, inspired by biomimicry, developed biomass derived adhesives, notably a material they called soy-mal-tan after its subcomponents of epoxidized soybean oil, malic acid, and tannic acid. They reported high strengths comparable to epoxies and an estimated net negative carbon footprint. However those authors also presented some factors which could limit its applicability within conservation such as relatively high temperatures for curing (180° C) and an inherent dark amber color. Others have noted concern that the tannic acid component may be prone to oxidation and that specific applications would require testing.

In spite of the potential limitations this adhesive sounds promising for novel applications within metals conservation where such high temperature can often be acceptable to the substrates, the color may be inconsequential, and the tannic acid component already has found use (e.g. the treatment of iron surfaces). This poster will present the results from experimental reproduction of the adhesive, investigation of reversibility and aging characteristics, and the empirical testing of several applications to the conservation of metals.

18 Blooming Solutions: Reviving Broken Plastics with 3D Printing

Patricia Navedo Garcia

As 3D printed artworks gain value in collections, the use of 3D techniques for contemporary art conservation remains limited. The variety of materials and techniques allows conservators to tailor their approach, yet outsourcing processes like photogrammetry and 3D printing often limits a conservator's direct involvement. This raises questions: Is it practical enough to incorporate these techniques into institutional or private practices? How can 3D technologies address contemporary conservation challenges like plastic degradation? This research uses a contemporary art case study with broken plastic flowers to examine a hands-on approach with 3D techniques, highlighting the opportunities and challenges, and providing insights for beginners. The author, with little experience in 3D technologies, used photogrammetry and 3D modelling software to digitally reconstruct the flower. Then, 3D printed samples of 8 materials, including extruded plastics, powder bed plastics, and cured resins, were examined to determine the most suitable option for the treatment. Standard resin had the best result, with high-detail resin and vapour-polished nylon following. The extruded plastics were determined to be too smooth and lose too much detail after post-processing. It was concluded that photogrammetry and 3D modelling should be done in-house while 3D printing can be outsourced. References and a comprehensive visual workflow accompany the research, illustrating the entire process from photogrammetry scans to the final 3D-printed product.

19 Creating the Ripple Effect on Embroidery Research and Development Center's Collaboration with Science and Technology Museum in Taiwan

Cheng-Chung Huang, Miao-Tzu Lin

The occurrence of resonance can make the activator of the resonance effect have a multiplier effect on the message to be conveyed to the publics. In Taiwan's textile conservation and research field, the International Embroidery Research and Center of Tainan University of Technology (IERC, TUT) has well known for preserving and repairing embroidery crafts and temple antiquities. The Embroidery Center found that the disappearance of embroidery skills and the decline of embroidery business in recent years have led to the difficulty of inheritance. Since 2017, IERC began to have the concept of "University has obligations to serve our society", and promoted the practice plan as called "Embroidery Skills Inheritance and Memory Extension". Until now, seven consecutive years served local communities and remote villages to promote embroidery aesthetic activities, and opened traditional embroidery craft talent cultivation courses. At the beginning of 2024, IERC cooperated with the National Science and Technology Museum to aim K4-K9 students to learn embroidery and tailoring skills, and scheduled to host a learning sharing and achievement presentation by the end of project.

IERC, TUT and Collections and Research Division, NSTM were established in 2002 and 2003 respectively, both of which offer exhibition hall visits. Therefore, building learning atmosphere from the two departments was considered as the main cooperation plan. The goal was expected to provide participants with an exciting and innovative experience through the tailoring and embroidery experience, and cultivate their interest in a career as an embroidery tailor. In addition, the participants heard the story of preserving traditional craft fabrics that their stereotyped impression of traditional embroidery skills were be changed. Apparently, creating a daily design with life aesthetics has become an unforgettable life experience.

This paper examined the ripple effect as a qualitative research theory, and analyzed that organizational cooperation had a substantial effect on external links, thereby expanding the preservation value of traditional textile skills. The research finding explained that there were two main reasons for the ripple effect. Firstly, to provide students with an exciting and innovative experience. Secondly, initial stage of establishment was reached to form a unique service system for Taiwan's embroidery clothing cultural assets.

20 From Genesis to Revelation: The Restoration of Richmond Barthé's Exodus and Dance

Kelly Caldwell, Katharine George, Helen M. Thomas-Haney

Exodus and Dance is an 80-foot concrete bas-relief sculptural frieze consisting of 16 individual panels designed and executed by artist Richmond Barthe in 1939. The sculpture was originally designed for an amphitheater to be constructed in the Harlem River Houses, the first of two housing projects in New York City funded by the Federal government to provide quality housing for working-class African Americans. Unfortunately, the amphitheater was never constructed, and the sculpture was not installed.

Exodus and Dance was later installed in the Kingsborough Houses in Brooklyn in 1941. Barthe was disappointed and ultimately abandoned this piece, as it was created to inspire African Americans, and Kingsborough Houses were not specifically built for African Americans. Fortunately, the sculpture has become a meaningful site for residents and has gained importance as being a significant piece by Barthe, considered to be the most significant sculptor of African-American modernism in the first half of the 20th Century.

Mounted to a free-standing brick wall, the frieze and wall had fallen into a state of disrepair. In 2018, its deteriorated condition and safety concerns of the area drew the attention of local historians, art organizations, historical centers, and local politicians.

Understanding the importance of the piece, the New York City Housing Authority (NYCHA) assembled a team of outside restoration architects and conservators with their in-house designers to design the restoration scope of work. Ronnette Riley Architects, with conservation firms Jablonski Building Conservation, Inc. (JBC) and EverGreene Architectural Arts (EverGreene), worked through both the design and construction phases of the project allowing the needed continuity to address the intricate technical aspects of the project.

Communication with and input from all stakeholders and interested parties was vital to the success of the project. Several community presentations were held which allowed the views of the local Kingsborough Housing community to be voiced. Stakeholders included Kingsborough Houses Resident Association President, development operations staff, NYCHA, Weeksville Heritage Center, Fulton Art Fair, The Mellon Foundation, and NYC Public Design Commission.

The treatments were carried out through a continued collaborative effort among the conservation teams, masons, and structural engineers. The unusual conservation challenges of this project will be discussed including the safe removal of the panels; stabilization without altering the physical properties and visual design; and integrating the artists' manufacturing methods with the new support system, to not cause undue stress on the large, thin relief panels.

This presentation will highlight the multi-faceted collaboration of owners, caretakers, users, stakeholders, architects, contractors, and conservators to conserve and restore this culturally significant artwork. It will also focus on the innovative two-conservator approach employed during the conservation process where JBC lead the design efforts and EverGreene peer-reviewed and offered support as well as implemented the removal, treatment, and reinstallation procedures.

The project offers a unique, cooperative approach between city and community stakeholders and preservation professionals, allowing an opportunity for new stories to be told by the community, offering a renewed understanding of the artist, and emphasizing the impact of artworks in public spaces.

21 Joining hands for heritage: Story of The City Palace Museum, Udaipur, India

Anuja Mukherjee, Bhasha Shah

India's rich history begins from the ancient civilisations to being the most diverse democracy in the world. Topographically, linguistically and culturally every region in India has its own uniqueness. Considering the scale and variety of tangible and intangible art forms in the country, their preservation has to be a combined effort and not limited to only conservation professionals. While professions in the heritage sector are steadily gaining popularity, the need of hour is to spread awareness and develop an inclination towards conservation in everyone. The conservation team at The City Palace Museum, Udaipur is taking initiatives to realise these objectives which will be highlighted through a poster.

The team has been actively taking efforts to engage various groups of people through in house activities and outreach programmes. Museum attendants, security personnel and guides as equal stakeholders were involved in training programmes to take care of the collection, safeguard it in emergencies and help in better implementation of museum rules. School and college students have also been invited to understand how various heritage departments work together for smooth functioning of a cultural institution. This programme was designed in a way so as to add heritage professions such as conservation to their list of future career options.

Outreach programmes are another realm of interest for the museum. It has been collaborating with other institutions in the country in order to popularize the Mewar collection beyond regional boundaries. Recently a major collection of maps and prints was conserved for an exhibition at another palace museum. As a part of this, the conservation team organized a talk and practical demonstration on conservation practices for a mixed audience of students, artists and heritage professionals. The intention was to understand their perspective and learn from their work experiences while imparting conservation suitable ways for protecting their personal possessions.

The positive response gained through these initiatives motivates the team to continue investing in them. The team hopes that the changes being attempted at the micro level will have a domino effect and usher in a conservation mindset through the country.

22 Imitation of a turned horn roller using 3D technology

Rachel Heyse, Richard House, Cynthia Schwarz

A hanging scroll displaying a 1935 painting of a horse by the Chinese artist Xu Beihong was gifted to the Yale University Art Gallery in 1940. The painting is in what is likely its original mounting, set against a deep purple silk brocade. However, at some point the left lower turned horn roller knob became detached from the scroll and disassociated with the object. For its upcoming display at the Gallery, several replacement options were considered. Both knobs could be removed and new knobs acquired. This option was limited by the fact that the extant knob is adhered to the wooden dowel, making safe removal difficult. A new, similar knob could be acquired that matched as close as possible. A third option was pursued - to imitate the extant knob using 3D imaging and printing technology. Photogrammetry was chosen as the 3D imaging technique. The high gloss surface of the knob presented a challenge but using cross polarized light led to a successful scan. The empty dowel on the left side of the scroll was also 3D imaged in order to create a negative space in the final model and create a snug fit for the replacement knob. The two scans were refined and combined using open source 3D modeling software. The resulting model was 3D printed at the Institute for the Preservation of Cultural Heritage (IPCH) Digitization lab. A Formlabs Form 2 stereolithography (SLA) printer, which uses a UV laser to cure liquid resin layer by layer into hard plastic, was used to print the model in black photopolymer resin. The print is sandable and paintable. The print was faux finished using acrylic paints and gloss medium. The knob was then pressure fit onto the scroll, resulting in a visually satisfying integration for display.

23 Will It Still Stick? -- Investigating Adhesive Suitability for the Consolidation of Steel Treated with Corrosion Inhibitor at the National September 11 Memorial & Museum

Rebecca Rosen, Kerith Koss Schrager, Andy Wolf

This project investigates the retreatablility of mild steel in a marine environment with a selection of conservation and proprietary adhesives after a corrosion inhibitor, Ship-2-Shore (S2S), has been applied. S2S is an oily, calcium sulfonate-based "dewatering fluid" that penetrates vulnerable areas and displaces moisture. Corroding steel will often delaminate and detach requiring consolidation methods that are compatible with this barrier-like corrosion inhibitor.

The locus of this exposed steel is a 60' x 60' portion of the Slurry Wall. This reinforced concrete architectural feature is an archaeological remnant of the original retaining wall responsible for holding back the Hudson River during excavation of the original World Trade Center site. It now remains preserved in situ as the 9/11 Memorial Museum's largest artifact. In the aftermath of 9/11, steel cables (tiebacks) were installed to stabilize and temporarily anchor the wall into bedrock during the site recovery. Though the Slurry Wall no longer performs a structural function, the tiebacks and their steel caps remain visible on the surface, continuously exposed to brackish water infiltration that was a feature of the wall since its inception.

Displaying a former structural element in a dynamic environment brings some conservation challenges. Reinforced concrete has an expected use life, and water ingress poses a continuing risk to the tiebacks. A five-year investigation of the structural integrity of the wall and conservation triage identified the corrosion and delamination of the tiebacks as a significant concern. After research into a variety of corrosion inhibitors that would function in this unique environment, half of the exposed tiebacks were treated with S2S. Although appearing to have mitigated the corrosion, S2S does not secure delaminating fragments. The proposed plan is to re-adhere lifting pieces before they detach. However, whether the S2S will interfere with curing and adhesive properties needs to be determined before implementation of any treatment plan. When one emergency is over, how do you plan for the next? Small-scale testing may help form the answer for ongoing care.

A DeFelsko PosiTest® AT Pull-off Adhesion Tester was used to quantify and compare the efficacy of 12 adhesives applied to both S2S-coated and uncoated steel plates in humid and ambient environmental conditions in laboratory setup. Graphs of the tensile strength data and detail images of the failed test joins reveal a marked and surprising difference in the performance of the various adhesives. Alkyd-compatible acrylic resins (Paraloid B-67, Plexigum PQ-611) in nonpolar solvents adhered best to the oily S2S surface without displacing the coating and allowing the formation of rust. A narrowed field of adhesives will determine the effects of additional parameters on relative tensile bond strength: adhesive concentrations, solvents selection, pre-corroded surface topographies, and cure time of the coating before adhesive application.

These tests inform an ideal treatment protocol for corroded steel that is consistently exposed to moisture and wet-dry cycles by balancing corrosion protection with surface integrity. Simulating maintenance treatments expected in future years builds a better understanding of how the metal, coating, and adhesive interact and prepares for next necessary interventions.

24 Anoxia Disinfestation of a Chocolate Sculpture: Collaborative approaches and technics

Helena Abreu, Vânia Assis, Filipe Duarte

This session delves into the interdisciplinary process involved in preserving edible art, with a focus on a chocolate sculpture that faced an infestation issue. It provides a detailed case study that illustrates the challenges encountered when dealing with organic materials, especially those that are not only valued for their artistic merit but are also perishable due to their composition. The preservation of such materials demands innovative and careful approaches, balancing the need to retain their aesthetic and cultural value while addressing their vulnerability to pests and environmental factors.

The session opens with an overview of the project's scope, goals, and key objectives. Participants are introduced to the chocolate sculpture, its significance, and the nature of the infestation that posed a serious threat to its integrity. This background sets the stage for the more technical and scientific discussions that follow, making it accessible even to those who may not have extensive experience in conservation science. A key part of the introduction is the emphasis on the interdisciplinary collaboration required to address the issue, involving experts from conservation science, art restoration, food safety, and engineering.

Following the introduction, the scientific principles behind anoxia disinfestation, a method used to treat the infestation, are discussed in detail. Anoxia disinfestation is a non-chemical process that eliminates pests by depriving them of oxygen, making it an ideal solution for treating organic materials like chocolate. The session explains the underlying biological principles that make this method effective, and presents data on its application in similar contexts involving organic art. The scientific rationale is further supported by evidence from past successful treatments of organic sculptures, ensuring that the audience gains a clear understanding of the method's validity.

The technical setup and implementation of the anoxia disinfestation process are also explored. This part of the session provides an in-depth look at the equipment and technology required to create an oxygen-free environment around the sculpture, detailing the steps taken to carefully enclose the artwork without causing damage. It discusses the specific challenges faced during the process, such as maintaining a consistent environment, managing temperature and humidity, and ensuring that the treatment is thorough without compromising the integrity of the chocolate. Practical solutions to these challenges are offered, giving participants a realistic view of the logistical hurdles involved in such treatments.

One of the most critical sections of the session focuses on the ethical considerations involved in preserving edible art. While conservation ethics are well established in traditional art forms, preserving objects intended for consumption raises unique questions. Should edible art be preserved indefinitely, or does its nature as food imply a more temporary existence? These considerations are explored in the context of the chocolate sculpture, and participants are encouraged to engage with these questions in a broader discussion of conservation ethics. Additionally, the session explores the potential future applications of these techniques, looking at how anoxia disinfestation could be used in similar contexts for other organic art forms.

The session concludes with an open-floor Q&A, allowing participants to engage directly with the experts, raise concerns, or explore further avenues of inquiry. This interactive portion ensures a dynamic exchange of ideas and offers the opportunity for participants to deepen their understanding of the process.

26 Investigation into uses of silicone rubber for tarnish removal and metal polishing

Megan Randall, Olivia Thanadabout

This poster looks at silicone rubber as a tool for silver polishing and tarnish removal. Silicone rubbers mixed with calcium carbonate as 'polishing erasers' have possible applications on artworks with mixed media components or fragile sections that pose challenges to traditional polishing methods. Three types of silicone rubber were sourced from Smooth-On to test efficacy and control on tarnished silver surfaces. The three rubbers under review are Sorta-Clear 12, Mold Star 30, and Equinox 40. All three silicone rubbers are platinum-cure and can be easily mixed by volume with a 1A:1B ratio. Each rubber was chosen for its specific Shore A hardness (ASTM D-2240). Sorta-Clear 12 is 12A, Mold Star 30 is 30A, and Equinox 40 is 40A, with the higher number denoting a harder rubber. Each rubber was cast into bricks with different amounts of lab-grade calcium carbonate mixed into the rubber during its pot life. A variety of cast and cut shapes of the cured rubbers, application lubricants, and clearing solutions were tested. This poster will review the process of mixing the rubbers, the addition of calcium carbonate, and the evaluation of each mixture's ability to safely remove tarnish. Implementations of this tool will be discussed, as well as possible advantages and disadvantages.

27 Yes! You can Read Comics in Class: The National Park Service Graphic Stories, a new and dynamic approach to technical guides

Speakers: Sydney Andrea Landers

National Center for Preservation Technology (NCPTT), Brooke Derr, Marissa Donahue, Sydney Andrea Landers, Robert Page, Michael Stachowicz

The National Park Service graphic stories are a series of one-page "graphic-novel" style educational guides on proper landscape care and maintenance around historically sensitive areas. The guides are used to teach seasonal and temporary workers at parks across the nation who are just learning about these principles for the first time. While other mediums can incorporate visual tools, the graphic stories are an all-encompassing package deal by incorporating illustration and narrative concurrently. As a result, workers can seamlessly learn about and visualize tools and safety precautions they need to apply in the field. The side by side relationship between text and visual within each individual "comic panel" delivers an efficient and comprehensive understanding of skills in one go that can not be replicated in other mediums. This tool is a fresh, new way to look at education and has made training more digestible and engaging. While simple visual guides have been utilized by the field, educating others on technical skills through mediums such as comics and graphic novels is very new. These stories are an effective tool to educate the new generation of conservators, preservationists and technicians by interweaving narrative and the visual.

The project is a result of collaboration between two National Park Service entities and a freelance historian and illustrator (me). The Olmsted Center for Landscape Preservation and the National Center for Preservation Technology and Training conceptualized the stories and authored the narratives. I worked closely with these teams to illustrate and lay out the stories in a clear and dynamic manner. I was brought on as the illustrator due to my dual practitioner knowledge, being both an illustrator and historic preservation professional. Illustrated digitally, each story incorporates a cohesive color palette and brush stroke style for uniformity within the series. Exploring topics such as "Pruning Trees", "Tool Maintenance", "Mowing" and "Hazardous Tree Response," I conducted copious research and reference material collection to ensure all the subjects I was illustrating were as accurate as possible as the guides are technical, first and foremost.

The initial phase of the project resulted in ten stories surrounding landscape care and maintenance around historically sensitive areas. More stories are in the works to continue this topic in addition to historic masonry and cemetery care and maintenance. As the National Park Service's training programs utilize the stories on the ground and in the field, it is a prime example of how we can use comics/graphic mediums to educate when the subject matter is so inherently visual.

28 Recent Investigations into Amine Deposits from Air Handling Systems

Alexa Beller, Rita Berg, Kristy Jeffcoat

This investigation was spurred by the discovery of hazy films on the surface of paintings within the collection of an anonymous collecting institution. The Midwest Art Conservation Center, a non-profit regional organization, was notified and asked to consult on potential causes and risks. First, assumptions were made connecting the appearance of this haze to the presence of wax within either or both the synthetic varnishes on the paintings' surfaces or in the lining adhesives. Further communication with collections care staff revealed the additional presence of a similar film on acrylic vitrines in nearby locations to the paintings. Inquiries with the museum's facility team indicated a history of usage of corrosion inhibiting additives to the HVAC system in the building. Specifically, amine-based additives like diethylaminoethanol (DEAE), were found in air testing at the institution and are commonly used within many facilities. Preliminary research cited usage and concerns within collection spaces as early as 1985.

This project will further research the historical and current usage of neutralizing amines within facility steam humidification systems. Additionally, analytical testing will be conducted on the accumulated film deposits to more accurately characterize their composition. Going forward, the broader aim for this project is to foster and initiate open discussion regarding airborne additives within collection spaces and collaboration with collections professionals at other institutions.

29 Seeing Past the Surface: The Research and Conservation of the Raclin Murphy Museum of Art's The Blessed Virgin Reading

Alexa Beller

One of the foremost artists working in Rome of his time, Carlo Maratti (1625-1713) and his Late Baroque classicism typified the tastes of the nobility and papacy. To help feed the demands for his art, which included Grand Tourists, Maratti managed a vibrant workshop where he trained three generations of successful painters. Within this studio practice, Maratti oversaw the production of studio variations of his most well-received compositions – one of which is The Virgin Reading. This poster explores the alterations and technical discoveries found during the conservation treatment of the Raclin Murphy Museum of Art at the University of Notre Dame's The Virgin Reading by Carlo Maratti (studio), occasioned by the reinstallation of the collection in their new building. Using infrared imaging, x-radiography, and cross sectional analysis of paint samples conservators at the Midwest Art Conservation Center in Minneapolis revealed significant compositional changes made to the Raclin Murphy's version, including the elimination of an entire figure. These discoveries may help to contextualize the painting within the many other variations of the composition and serve to illustrate the web of relationships among reproductions that emerge from an active workshop such as Maratti's. The research and conservation treatment of the Raclin Murphy Museum of Art's The Blessed Virgin Reading demonstrates how art historians and conservators can collaboratively provide a more holistic understanding of the provenance and manufacture of artworks.

30 Gossamer Paintings: A Web Connecting Paper, Textiles, and Paintings Conservators

Megan Creamer, Manuela Wiesend, Lindsey Williams

In the late 18th century, Elias Prunner painted on a small canvas made of webs harvested from the Puster Valley of the Alps in what is now Austria. Gemalde auf Spinnengewebe or "Painting on cobweb" developed into a type of local folk art of predominantly ecclesiastical imagery; made to hang in windows while light shone through them. Social awareness of this style of painting doesn't appear to have gone beyond the geographical limits of the Tyrol region until the mid-19th century when local art dealers found they could be sold as souvenirs to foreign travelers and employed multiple artists. The style changed from ecclesiastical themes to vignettes of local traditions and portraits of famous people. Since these paintings were made only for a short amount of time and by a small grouping of artists from a particular region, there are very few examples of them remaining, some estimates suggest ~100 or less.

A highlight of these paintings is in their materiality: that of the insect webbing that makes up the canvas, but as we discovered, not that of an arachnid.

The canvases were stretched and placed into a thick paper surround and then 'safely' packaged in either cloth-bound or paper-cover portfolios typically depicting a spider on a web just in case you forgot about the uniqueness of the object. Their material nature is inherently delicate and with the impacts of time, mechanical stress, and fluctuations in temperature and humidity, those that do remain are susceptible to future damage. Very few conservators have studied the material nature of these paintings, let alone treated them, and due to their rarity and fragility, it is necessary to inform the conservation community of their existence to avoid their potential passive extinction.

Northwestern University Libraries houses 5 of these paintings in various conditions, two having been treated in the 1980s. With sparse literature on the material nature of these objects, cross-disciplinary and international collaboration were necessary. Initial observations of these objects were compared to those in Manuela Wiesend's 2012 thesis, which she generously supplied. Additionally, they were examined using Foster+Freeman's VSC80 for reflected and transmitted light imaging, as well as stereo-microscopy to determine the layers and components of the painting. To further explore the materiality of the cobweb, polarized light microscopy was used to examine the fiber morphology, take measurements, and compare to reference samples of other insect-sourced fibers from the slide collection of the Art Institute of Chicago. From the analyses, it was clear that the webbing from the canvas has features that are distinctly different from other insect-sourced fibers such as arachnid silk and the far more common silkworm silk from wild or cultivated species.

Visuals on the poster will showcase the characteristics and features of these unique 'cobweb' objects: motifs on the original housings, subject matter, macro appearance, and patterns of damage. Images captured from the various analyses including imaging and fiber microscopy, and a brief overview of treatment techniques drawn from paper conservation will also be highlighted.

31 From Fear to Familiarity: The Role of a 'Bug Bulletin' in Strengthening Integrated Pest Management

Elise Etrheim

Effective Integrated Pest Management (IPM) is a crucial element of preventive conservation, safeguarding collections from damage caused or signaled by pests. However, raising awareness and prompting action within an institution can be challenging, especially among staff not directly involved in pest monitoring. This challenge is compounded by the complex, data-heavy nature of IPM programs, which often require specialized knowledge to analyze and interpret.

At the University of Arizona (UofA) Libraries Special Collections, a small preservation team of four oversees a building-wide IPM program to monitor pest populations and mitigate their risk to the collection. Following a recent update to our program, we saw an opportunity to implement creative communication methods to enhance staff engagement and familiarity with the program—one such method was our in-house 'Bug Bulletin'. So far, this approach has proven effective in increasing overall awareness and participation in the IPM program.

The 'Bug Bulletin' is a quarterly internal report designed to demystify IPM, inform staff about current pest activity, and equip them with knowledge to support pest-prevention efforts. Limited to four pages, it combines practical updates on pest occurrences with engaging content, including short pest profiles, fun facts about common pests, recognition of highly engaged staff, and best practice recommendations. Special attention was given to creating visually appealing layouts and using clear, non-technical language to ensure accessibility across all departments—whether administrative, facilities, or curatorial.

The bulletin's impact has been twofold: it elevated IPM as a shared institutional responsibility and enhanced staff members' ability to recognize early signs of pest infestations. By incorporating visuals and humor, the 'Bug Bulletin' has transformed how staff approach this otherwise unappealing subject matter, making it more engaging. Informal feedback from colleagues suggests that the bulletin has inspired closer observation and a greater adherence to pest-prevention practices.

Beyond increasing engagement, the success of the 'Bug Bulletin' has sparked discussions about adapting other internal communication strategies, encouraging a more interdisciplinary and integrated approach to preventive conservation. This project has highlighted the value of innovative, staff-wide communication strategies at the UofA Libraries Special Collections in strengthening preventive efforts and building institutional resilience against pests. In the end, IPM and other preservation strategies greatly benefit from institution-wide support, understanding, and engagement.

34 Together we rise: Introducing high school students to the conservation and museum fields through the Summer RISE program

Austin Anderson

Since 2019, Glenstone Museum, in Potomac, Maryland, has been actively involved in Summer RISE, an annual summer program organized by Montgomery County Public Schools' (MCPS) Department of Partnerships. Summer RISE, which stands for "Reimagining an Innovative Student Experience," offers rising high school juniors and seniors the opportunity to gain real work experience through placements with participating companies and institutions throughout the region. Over the course of four weeks in July, students work for 50 or more hours in their placement and are paid for their work at the conclusion of the program.

Glenstone's Conservation Department has been a key supporter of this program since the beginning of Glenstone's involvement. With help from Glenstone's Community Engagement Department, which organizes the program on the internal institutional level, Conservation has taken at least one high school student each year. Conservation plans a variety of activities with the students in order to provide a well-rounded introduction to the field. This often includes an introductory presentation on the field of conservation, hands-on washing of outdoor sculpture, practice doing condition assessments, carrying out simple mock-treatments, and color-matching activities. Glenstone's students, which are placed by RISE coordinators based on their stated interests, often have an interest in art but may not have heard of conservation before. By the end of July, students leave with a basic understanding of conservation and are better informed on museum careers in general as they begin to plan for college and life after high school. In one successful example, a former alumna of the program even reached out for guidance on pre-program conservation internships and education pathways after her interest in conservation was sparked at Glenstone.

Supporting the program has not come without occasional difficulties, however, and in the spirit of continuous improvement, certain aspects have been modified over the years. For example, as a small team of busy conservators, it has proven complicated to organize the oversight needed for multiple high school students throughout the summer. Conservation now collaborates with its fellow departments by sharing a slightly larger group of three or more students among the entire Collections Division. In doing so, we have been able to more evenly distribute the internal responsibilities. Although the students spend less time with Conservation, we are now able to take a larger group and broaden their experiences to include adjacent activities in Registration, Curatorial, Library, and Archives. Other challenges, such as varying degrees of student interest and scheduling conflicts are dealt with in stride and are an anticipated part of the program. In all, Summer RISE has proven to be a great success at Glenstone and has strengthened our relationship with community partners such as MCPS. Through this mode of outreach, we are able to share the field of conservation with eager students, spark interest where there may have been none before, and allow for them to experience first-hand the possibilities of working in the museum field.

35 When Objects "Go Home for a Visit": Flipping the Script (and the Map!) on Collections Access

Abby Lyell, Lea McChesney, Wendi Field Murray, Amanda Nelson, Patty Talahongva

In June 2024, several dozen 20th century Hopi objects made the unlikely journey from Wesleyan University, Connecticut to Moenkopi, Arizona for a week-long visit. It was unlikely because it was not an exhibit, loan, or repatriation request– rather, it was a "re-imagined" collections research visit, coordinated in collaboration with Patty Talahongva, a Hopi woman who had recently discovered that her great-great grandmother's pottery was in Wesleyan's collections.

Talahongva's request challenged Wesleyan to reconfigure the temporal and spatial conventions of museum collections access. Rather than requiring members of the community to come to the repository, the repository went to Hopi. Rather than work out the logistics for 2-3 years (as would be typical for a traveling exhibit), the planning and execution of this event took place in less than 12 months - one reason for the urgency was the age of the descendants of the artists, many of whom are in their 80s and 90s. For three days, Hopi community members, direct descendants of the objects' creators, and members of the general public were able to engage directly and meaningfully with works of pottery, basketry, katsina dolls, and textiles. During our event grandparents were able to share this experience with their grandchildren and even some great grandchildren. While unorthodox from a museum perspective, Talahongva's vision aligned with the Wesleyan Library's desire to embody more inclusive models for access, to think more expansively about modes of "preservation," and to consider the importance of contemporary cultural connections in care regimes.

By centering contemporary Hopi families and Hopi lands in the request for collections access, the Tuma Angwu Owya ("Let's Go Home for a Visit") project lays the groundwork for more inclusive, responsive, and culturally informed models of stewardship and collections care. This presentation will provide context for the original collection, the factors motivating Talahongva's initial request, and the triumphs and challenges of planning such an innovative and unconventional event, from the perspective of both community partners and collections staff. We will also discuss the ripple effects of the project on the repository and the Hopi community over a year later and thoughts on the viability of this model for other museums.

36 Better Together: A Case Study Demonstrating the Benefits of Collaborative Curation

Ann Kearney

Universities encompass various communities. When members of these communities combine efforts, they can achieve extraordinary results.

This presentation offers a case study showing anticipated as well as unforeseen benefits made possible by collaborative curation. Focusing on the Libros/Arte exhibit held at the University of Albany Museum during the fall of 2023, it considers how the cooperative conceptualization, organization, selection, and the realization of the exhibit maximized opportunities for outreach programming as well as for overall exhibit attendance.

The above process, conducted over two and a half years, involved an interdisciplinary team of eight university members. Bi-weekly meetings provided opportunities for learning about other fields, sharing information, and developing new skills. These meetings also encouraged participants to hone professional communication skills, and ultimately fostered a sense of trust among group members.

Conservators bring knowledge and understanding of various fields—cultural history, materials science, studio art—to their work and to all professional interactions. They are uniquely positioned to approach challenges from varied vantage points to obtain a solution. Working with other university experts in many fields, their efforts can help produce extraordinary results in terms of outreach potential and museum exhibit attendance. While these undertakings also offer all participants rich opportunities for learning and growth, the value of including conservators in these collaborations is a highlight of this presentation.

This study relies on procedural records and museum attendance data to establish the significance of collaboration on museum exhibit and related-event attendance. It also considers reflections from exhibit curation collaborator interviews regarding the value of their experiences.

The investigation shows that the number of outreach events scheduled for this particular exhibition, as well as the overall attendance numbers for Libros/Arte , exceed those of university museum exhibits held over the past three years. In addition, all members of the curation team expressed appreciation for the experience of working together, with 'opportunity for learning' being the most frequently cited benefit. The library conservator, in particular, with a broad base of knowledge, found great benefit in this experience.

In conclusion, the decision by the University at Albany Art Museum to engage in the collaborative curation of the Libros/Arte exhibit resulted in the development of a microcosm of an ideal university community: a place for conversation, collaboration, and growth.

37 Monumental fills: Balancing conservation ethics, curatorial wishes, and engineering constraints

Julia Commander, Molly Gleeson, Jennifer McGough, Michaela Paulson

The Penn Museum's Coxe Wing opened in 1926 to display and house the breadth of the museum's ancient Egyptian collection. Nearly 100 years later, the Coxe Wing is undergoing the largest renovation project ever undertaken by the Museum. When the renovation is complete, the new Ancient Egypt and Nubia Galleries will span 14,000 square feet of gallery space and will feature thousands of artifacts spanning all of ancient Egyptian history. Beginning in 2018, the Museum partnered with a team of designers, architects, and engineers to plan and design updates to these galleries, followed by a phased deinstallation of the exhibitions from 2018 through 2023. The monumental stone architectural elements were subsequently moved to a dedicated offsite workspace at the Conservation Laboratory Annex, where work on these materials continues. Decisions about structural support are made through intensive collaboration between conservators, engineers, and mount-makers. Decisions about the aesthetics of surface treatments are the result of conversations between conservators, curators, and the exhibitions department as well as outside designers and fabricators.

The Conservation Department is responsible for the evaluation and treatment of all objects selected for display, including the monumental architectural components of a New Kingdom pharaonic palace and painted stone blocks from an Old Kingdom funerary chapel. While the most critical work relates to the structural stabilization of the pieces, the aesthetic compensation is integral to the interpretation and overall visitor comprehension and experience. At this scale (e.g. 30-foot-high columns and 13-foot-tall doorways), the six feet – six inches rule becomes somewhat irrelevant.

Many of the monumental pieces have large missing sections. Some of these monumental pieces were included in the original 1926 installation and many have a history of extensive restoration. Much of the restoration work from the 1920s requires painstaking and slow deconstruction to reverse. As part of the new design, conservation, and engineering process, decisions are being made for loss compensation that must be stable enough to last another 100 years, but the conservation team is also emphasizing the importance of building in the flexibility to allow for potential future modifications or changes to the aesthetic compensation. Inevitably, the solutions are a balance of curatorial wishes, conservation ethics, and engineering requirements.

The conservation team has faced challenges in achieving consistency in the approach and appearance of large fills across a variety of monumental stone elements. This poster will present the approaches being taken and the rationale behind these decisions.

38 Exhibiting Chinese Books - an elegant and sustainable approach

Jody Beenk, Lesley Liu

Custom-made acrylic book cradles can be expensive to produce, time-consuming to make or procure, and difficult to recycle. At the University of Hong Kong Libraries (HKUL), as we were developing a series of exhibitions of traditional Chinese thread-bound books, we wanted to find a material and method that would be affordable, reusable and easy to produce inhouse. The majority of Chinese rare books found in library collections today have textblocks made of paper with either a paper or textile cover that is stab bound along one edge, resulting in a rigid spine but a flexible and lightweight textblock. In researching material that would be able to support the drape of the textblock while holding the spine in place, we focused our attention on a combination of rolled foam and polyester sheets. Rolled pieces of Volara foam attached to a base became our preferred type of support. It can accommodate fascicles of different thicknesses and heights and can be displayed flat or at various angles. While this material accommodates a significant number of traditional books, some require a slightly different approach. To supplement the foam supports, we also fabricated a series of matboard supports that are similar to book supports created for Western codices, but with modifications that address the specific requirements of Chinese thread-bound books. These methods can be altered in a myriad of ways to safely and elegantly showcase these delicate books with a support system that can be reused both for exhibition display and as supports in a library reading room. At HKUL and the Weissman Preservation Center (Harvard Library) the fabrication of book supports for Chinese and other Asian books continues to evolve.

39 Chasing Colors: Characterizations of Dyes in Velox Transparent Water Color Stamps

Tomika Benjamin, Abed Haddad

Velox Transparent Water Color Stamps, manufactured by Eastman Kodak Co. in Rochester, N.Y., were marketed primarily to professional and amateur photographers and artists for hand-coloring black-and-white photographs. First appearing around 1914, Velox packets contained 12 perforated dye sheets, each separated by paper cover pages that briefly described their intended use. The descriptions were often poetic, with phrases like "A soft, beautiful yellow for use in flower work, sky tints, etc." The 12 colors in a typical Velox packet included Light Yellow, Deep Yellow, Flesh Tint, Brilliant Red, Scarlet, Warm Brown, Foliage Green, Deep Green, Light Blue, Dark Blue, Violet, and Stone Gray. These dyes allowed photographers to hand-tint their images, enhancing aesthetic appeal and offering a more personalized, artistic touch. The practice became popular in an era when color photography was still experimental, and products like Velox provided a simple, accessible solution for adding color to black-and-white prints. This research sought to identify the chemical compositions of the dyes found in an undated Velox Transparent Watercolor Stamps brochure from the Getty Conservation Institute (GCI) photographic study collection. Accurately identifying these dyes can guide conservation efforts, particularly in preserving photographs employing hand-coloring. Several techniques were used to analyze the dyes: Raman Spectroscopy, Fourier Transform Infrared Spectroscopy (FTIR), Surface-Enhanced Raman Spectroscopy (SERS), and Thin Layer Chromatography-SERS (TLC-SERS). Initially, Raman and FTIR spectroscopy provided preliminary spectra for each dye. While many of the dyes exhibited fluorescence under Raman, FTIR analysis yielded some promising results, helping to suggest which aniline dyes were present based on specific spectral peaks. SERS was applied using silver nanoparticles to overcome fluorescence and amplify the weaker Raman signals. This method offered higher sensitivity by quenching fluorescence, allowing vibrational modes to be more clearly detected. Because Raman, FTIR, and SERS are not separation techniques, Thin Layer Chromatography (TLC) was used to isolate individual dye components and determine if any mixtures were present. TLC-SERS proved especially useful when, for example, the two yellow colors were analyzed. While both Light Yellow and Deep Yellow appeared to contain Acid Yellow 23 according to Raman and FTIR, TLC-SERS analysis revealed that Deep Yellow was a mixture of Acid Yellow 23 and Acid Orange 7. The results of this study have potential implications for art historical and conservation research. By identifying the specific dyes used in Velox products, conservators can better understand the materials involved in hand-colored photographs. This research allows for more informed decisions in preserving photographs containing similar aniline dyes.

40 Vestiges of Ownership and Provenance: Marcas de Fuego (Firebrands) from The Huntington's Mexican Incunabula Collection

Verónica Mercado

The conservation and digitization assessment of The Huntington's Mexican Primeros Libros collection revealed that 15 out of 54 early Novo-Hispanic publications bear marcas de fuego—epigraphic or figurative marks burned into the edges of books with a hot iron tool. These irreversible branding marks, believed to have originated in the mid-sixteenth century in the Viceroyalty of New Spain, were used to assert ownership and prevent theft. Marcas de fuego provide crucial insight into the provenance and ownership history of viceregal Novo-Hispanic collections, offering a glimpse into the fate of conventual and private libraries following their dissolution and nationalization in the nineteenth century.

The conservator collaborated with the Catálogo Colectivo de Marcas de Fuego (CCMF), a digital platform dedicated to cataloging fire-branded printed works, to reconstruct fragmented viceregal collections worldwide. Following CCMF guidelines, Verónica employed a Nikon D810 with normal and raking illumination to photograph the firebrands, processing the images in Adobe Lightroom. She captured title pages, provenance notes (such as friar names and convent locations), and measured the firebrands in millimeters to aid identification. Data was compared with the CCMF database, revealing the provenance of the books, including the city, religious order, institution, and, in some cases, original owners.

The survey found that the Franciscan Order once owned 10 out of the 15 fire-branded volumes. The most common placement of firebrands was on the head edge (7 books), with fewer marks on the tail (3 books) and both the head and tail (2 books). One book featured marks on all three edges, while only one book bore a firebrand on the title page. Of the 15 fire-branded books, 10 could be traced to specific cities and convents. Several marks were unidentifiable due to factors such as charred firebrands (2 books), an incomplete firebrand (1 book), and faint marks obscured by gilding or trimming (1 book). This last finding suggests that firebrands were sometimes partially removed during rebinding, edge gilding, or trimming in the nineteenth and twentieth centuries, resulting in the physical loss of provenance information.

Research from The Huntington's acquisition records, supported by curatorial consultations, confirmed that these volumes were acquired between 1911 and 1926, with existing binding alterations, indicating that they were rebound prior to acquisition. These findings demonstrate that firebrands are essential for understanding the migration of early Novo-Hispanic printed works into local and international collections. This project serves as a model for U.S. cultural heritage institutions to engage with initiatives like CCMF, emphasizing bilingual scholarship and the distinctive material characteristics of Latin American collections. The research underscores the importance of international partnerships and the role of conservators in the examination of global heritage, advocating for comprehensive studies and equitable preservation practices to reconstruct fragmented cultural histories.

41 Treatment of a Chinese Porcelain Vase with European Figures

Haddon Dine

In 2020 the Art Institute of Chicago's Applied Arts of Europe and Arts of Asia departments jointly acquired a rare porcelain vase with two European figures on it, made in China in the second half of the 18th century, during the reign of emperor Qianlong. Originally thought to be intended for export to Europe, curatorial research found that it was produced for the Chinese imperial market,

and that a matching mirrored version exists at the Museu Medeiros e Almeida in Portugal. The vase is constructed with a hole in the bottom, so it is not functional. When purchased, it had a variety of old deteriorating restorations as well as unfilled losses. Both figures' hats were heavily restored, with the extent of original material below the lumpy restoration unclear. A face, hair, and fingers also had fills. Most notably, only one of the figures' four original feet remained. Two other feet were noticeable, deteriorating replicas, and the fourth was missing completely.

When treatment was undertaken, interesting details of the past restoration techniques and original techniques of manufacture were revealed. The restoration materials included unusual red low fire ceramic fills attached using threaded rods, paper left behind to contain plaster during the past restoration, and a black resinous material that was confirmed by analysis to be shellac-based. Old misaligned joins were disassembled, which revealed manufacture details on the inside of the head of one figure that would never have been visible except during treatment. The hats were formed separately and applied to the heads – a bead of slip is visible at the join.

The fills on the face were discovered to have been covering firing flaws, which were left unfilled at the end of this treatment as they are original manufacture features. For the losses in the hats, fingers, hair, and single right foot, existing matching elements were used to base the fills on without significant inference. However, since each figure was on one knee, the left and right feet differed significantly in position, and there was no extant left foot on which to base the restorations of the two left feet. Photographs sent by the Museu Medeiros e Almeida of the matching vase in Portugal were referenced, but it was unclear if those feet were also restored. Measurements based on photos of one potentially original matching foot resulted in a foot length significantly longer than the one existing right foot on the Chicago vase. After discussing with the curators and making mockups of multiple foot sizes, the decision was made to base the foot on the single extant right foot on the vase. If it is confirmed eventually that the replica feet are shorter than the original left feet, this can be corrected. The vase is slated to go on view in a major reinstallation of the Art Institute's Applied Arts of Europe galleries in 2025.

42 Are you thready for this? Collaborating with undergraduate students on a new textile-making studio course at the University of Delaware

Authors: Anne Clark, Madeline Hagerman, Sabrina Hettinger, Hailey Kremenek

One of the unique aspects of the undergraduate Art Conservation Department at the University of Delaware is its tradition of teaching students to appreciate original manufacturing techniques through hands-on studio courses. While many of our existing courses emphasize drawing skills, I wanted to create a space where students could learn about the history of textiles through direct engagement with intricate techniques. Last spring, I developed a textile-making course that focuses deeply on the process of making. This became a collaborative endeavor, enriched by the diverse expertise of my undergraduate students.

Much of my knowledge in textile crafts is self-taught, starting when my grandmother taught me to knit at the age of ten. However, I quickly realized that creating this course would benefit greatly from the input of some of my students who had their own extensive backgrounds in textile arts. Anne Clark brought her years of experience as a professional weaver in New Mexico; Sabrina Hettinger had over a decade of costuming experience for theater; and Hailey Kremenek recently worked on an exhibition focused on the conservation of fashion designer Ann Lowe's gowns at Winterthur Museum, Garden & Library. Though they were all registered for the class, I also invited them to collaborate as teaching assistants, allowing them to lead class sessions and share insights that only someone with their background could offer. Collaborating with students in this direct manner is rare, especially in the development of a course, and it created a unique opportunity for peer-to-peer learning within an undergraduate setting.

The course involves weekly projects on different techniques, from felting to weaving to embroidery, with interspersed work days. Their final project consisted of a textile portfolio and a historical recreation project made using the techniques learned in class or based on a students' interests. Hailey taught herself how to make bobbin lace, another student recreated Kermit the Frog in felt, someone embroidered a moon rabbit in silk, and Sabrina created a panel of jewel beetling embroidery with gold work.

Their involvement did not just impact the course's first iteration; it has shaped its future. As I prepared to teach the course again this fall, I sought their input once again on what worked and what could be improved. Their contributions and enthusiasm have been fundamental to the course's development and success.

This paper aims to explore the power of collaboration within academia, particularly how working closely with students can lead to a richer, more dynamic learning experience. By drawing on the expertise of these undergraduate collaborators, we created a course that goes beyond education, rooting itself in historical craft techniques and the lived experiences of those involved. This experience reinforces the theme of this conference: that the skills and stories each person brings are invaluable, and that our field is made stronger through collaboration and the inclusion of diverse voices.

43 Artifact Storage Box

Todd Holmberg

In the field of conservation and collections care, effective storage solutions are crucial for preserving artifacts while ensuring ease of access and handling. This poster presents a prototype of a storage box designed and constructed with the goal of addressing key challenges in artifact preservation. The design creates a solution for museums that is potentially mass producible in-house, utilizing conservation-approved materials to ensure long-term protection. The boxes are designed to accommodate artifacts around the size of a softball and address as many of the "agents of deterioration" as possible. Key features include:

- A viewing window to minimize unnecessary handling. Standardized labeling to minimize potential custodial neglect.
- Gasketed seal and provisions for silica gel to create a relative humidity buffering effect and keep dust and insects out.
- Coroplast material that can protect against water spills.
- A tray that is held secure within the box structure that can be equipped with a custom Ethafoam nest to address physical forces.
- This approach aims to balance practicality with rigorous collection care standards, offering a robust solution for museum storage needs.

44 Rethinking the Book Cradle: Addressing Efficiency and Functionality challenges with book handling

Juilee Decker, Louis Drum, Leah Humenuck

Book cradles are an important tool for handling and interacting with books. Whether it be for display, reading, imaging, or restoration, a book cradle is at the center of the book's safety and stability for various interactions. There have been many iterations of the book cradle, from bespoke to manufactured, however there is a need for book cradles that meet goals of efficiency and sustainability.

Book cradles are crafted and modified to fit the book they are currently serving, whether that is by stacking multiple foam wedges, a custom acrylic stand, or rearranging pillows in order to support the proper places on a book. There is a need in reading rooms to balance efficiency, cost, and space. For cultural heritage institutions aiming for sustainability, single-use cradles may not be helping to reach that goal. For institutions who have limited space, keeping various sized wedges, where some of them may spend more time in

storage rather than being used, can be challenging. Additionally, there may be situations where multiple patrons require a particular size of book support, but there may be a limited number of them available. Born from interviews with archivists, librarians, curators, conservators, and related professionals, the design of an updated book cradle is proposed. Furthermore this project displays the fruit of collaboration among designers, conservators, archivists, and other museum professionals to create purpose-built solutions for cultural heritage.

The designer and author, Louis Drum, gathered common "pain points" from interviews, determining the challenges that many professionals faced with book cradles, some of which included inefficiency of swapping wedges, or not finding quite the right angle of support. Within these interviews spine support was also emphasized, and how some current options may not be appropriately achieving it.

With these challenges in mind, a concept was modeled for an adjustable cradle using Fusion360 that can be moved and changed without needing to remove the book from the cradle, and can eliminate the need for custom single-use cradles.

Currently the materials proposed to make this cradle are the following: the internal structure of the cradle will be made of a sturdy acrylic; the surfaces will be covered with a thin layer of foam; and all of it will be wrapped in a conservation-grade fabric.

For the functionality, the opening angle of the cradle is currently able to be adjusted from 60° to 120°, and the plates can extend to fully support books with a wingspan up to 27 inches. The middle of the cradle leaves room for different-sized spine inserts, or allows for the use of book pillows. The cradle can be folded in half and stored in a custom carrying case that can also store spine inserts, book snakes, and any other accessory necessary for handling books.

There are currently more improvements to the model being worked on such as vertical angle adjustment and a wider angle allowance. With this in mind, the proposed cradle intends to enhance the experience interacting with a book while also being efficient, sustainable, and cost-effective.

46 Keeping it Together: The use of Fine Fiber Stitching for Mending an Islamic Manuscript on Sandalwood Veneer

Abra Mueller

In 2022, the Northeast Document Conservation Center (NEDCC) received an unusual object for treatment from the special collections library at Middlebury College. The book was a 19th century partial Quranic manuscript bound in lacquered boards. While this type of binding is not uncommon, what made it remarkable was that the manuscript was written on a substrate of incredibly fragile sandalwood veneer. Nearly every leaf was cracked or fully broken and the sewing was no longer intact. Historic repairs and added wove paper borders had caused additional damage as adhesive strain had pulled on the veneer over time. The leaves were sewn on textile tapes and the tightback leather spine did not allow for safe opening or handling. On top of all of this, the media was extremely soluble. In bringing the book to NEDCC, the client's hope was to allow for continued, though limited, use, maintaining as much of the original structure and function of the volume as possible.

The first and most obvious challenge that we faced was how to repair the sandalwood leaves. Given the solubility of the media and the cracks running directly through text, traditional mending with Japanese paper and wheat starch paste was not an option. Instead we decided to employ a fine fiber stitch technique, originally developed by conservators at the British Library to repair a copper-corroded Mercator Atlas. Though no copper-based pigments were present in our manuscript, the benefits of a low-moisture repair for our purposes were obvious.

In this technique, Japanese paper is blended into pulp which is dried in thin strips. Individual kozo fibers are then dipped in a very dry wheat starch paste and placed across the tear as a bridge, providing a strong and flexible mend. The result is a nearly invisible repair. Under magnification, these mends resemble stitching, which gives the technique its name.

After the veneer repairs were complete, the second, equally formidable challenge was rebinding the manuscript. Once the text block was resewn, it was determined that any adhesive applied to the spine would cause more stress and continued breakage. With help from colleagues at other institutions, a non-adhesive spine lining and rebacking technique was developed that promoted gentle movement and prevented further breakages.

Every step of this project required collaboration with colleagues in and outside of NEDCC. There were failures, setbacks, and other frustrations that could not have been overcome without a host of conservators and scholars coming to my aid. In this presentation, I will discuss the new approaches in methodology that I developed as the treatment progressed, but I will also reflect on the collaborative efforts that lead to its successful outcomes.

47 MFT as a Tool for Collaboration with Indigenous Communities

Stephanie Black, Erin Murphy

Conservation display parameters are devised to minimize damage to cultural heritage while simultaneously maximizing their viewability. The Field Museum performs microfade testing (MFT), sharing this information with collaborators to help them determine if an item is suitable for display. This poster presentation will review the Field Museum's methodology and guidelines for best practices using MFT. It will highlight the outcomes of sharing test results with Native collaborators for various belongings currently on exhibit in the Field Museum's Native Truths Hall. When working with Native American belongings and deciding on an appropriate length of time an item can safely be exposed to light, this analysis can become the basis for a collaborative discussion during outreach and communication.

When MFT is done in consultation with Tribal Representatives, it creates a space for shared stewardship. MFT results can help demonstrate the long-term stability of an item or flag potential light sensitivity. Explanations on how conservation and collections care specialists normally limit damage to an item, i.e. either decreasing the intensity of light exposure or shortening the exposure time, creates transparency in the work so that Native collaborators can make determinations that they believe are best for their belongings.

The purpose of using MFT when consulting and collaborating with communities is in the interest of giving Tribes and Native individuals more decision-making over their belongings in museum collections and allows the conservator to practice ethical stewardship. MFT presents conservation with another aspect of decision-making that can be shared and lead to an open discourse on how best conservators can work with underserved communities to care for their cultural heritage. It is important that conservation broadens outreach and collaboration by truly allowing Indigenous peoples to have authority over their cultural belongings.

48 Timing is Everything: Optimal Measuring Time for Neon Color and Brightness

Ellen Moody, Bogna Skwara

Gas discharge lamps or "neon" objects are a significant part of modern visual culture. Since the 1920s, stemming from signage and advertising, they initially populated urban landscapes to make their way into the art world shortly thereafter. Made by hand, neon units' production requires highly skilled artisans, and their lifetime is typically limited to several decades, meaning their replacement is integral to the conservation of artworks containing them. Though this technology is present in art collections worldwide, literature regarding its conservation and care remains scarce.

The color and brightness of neon shifts gradually over time. The exact rate of this aging depends on many factors, including the length and diameter of tubes, the kind of gas they contain, and whether the tubes are continuously or occasionally activated. This propensity to change over time, combined with

the fact that neon units require color-matched replacement when they break or reach their end of life, makes color and brightness measurement a valuable tool for documentation. The noble gases used in neon lamps have full outer electron shells, which make them chemically inert and create a distinctive colored light when ionized by the high voltage that passes through them when activated. However, ionization of the gas takes a period of time to reach a consistent color and brightness; these two values initially shift to varying degrees when a neon unit is turned on. To reliably document these qualities, one first needs to know the point when that variance diminishes.

The goal of this study is to better understand how long a neon unit should remain on to minimize variations in color and irradiance of the two most common gas combinations used in neon production: neon (Ne) and the argon with mercury (Ar-Hg). We look at the warmup times for four units with two gas and phosphor variations in commonly used tubes (10mm, lead free, colorless glass): an uncoated tube with Ne, an uncoated tube with Ar-Hg, a phosphor-coated tube with Ne, and a phosphor-coated tube with Ar-Hg. Clusters of measurements were taken at regular time intervals with the Gigahertz-Optik MSC15 Spectrometer. We compared trends in averages and standard deviations for irradiance and colorimetry values, as well as spectral power distributions to establish whether variance reliably decreases over time to a value that is below what is perceptible to the human eye, or the just noticeable difference (JND).

This poster summarizes our findings for these test units, as well as historic neon objects, and proposes recommendations for assessing the warmup time of neon artworks. The study is a continuation of a research project on the care of neon-based artworks undertaken at the Getty Conservation Institute, whose initial outcomes were presented during the 51st AIC annual meeting.

49 Revealed – A hidden message from 1834

Cayla Stifler, Amalia Wojciechowski

John James Audubon, a prolific naturalist and artist known for his seminal work The Birds of America, had only a few of his oil paintings survive to today. While 435 meticulously rendered hand-colored aquatints of Birds of America (1827–1838) are well known, his work in oil is considered quite rare.

Audubon's Pacific Loons, an oil painting dating from ca. 1834, was acquired by the Leigh Yawkey Woodson Art Museum in 2007, along with the hand-colored aquatint. The aquatint features three birds, an adult male, a female, and a young bird in winter plumage, while the oil painting only depicts two birds. The location of the two loons in the painting mirrors that of the print. The discrepancy between the oil painting and the aquatint suggests there may be some additional information in the original oil painting. During a recent on-site collaboration, we used a recently developed RevealScan™-M multi-range infrared reflectance device (Middleton Spectral Vision, Middleton WI) to probe the painting.

The combination of the measured images shows three additional birds, both reminiscent of, yet clearly distinct from the bird that appears in the aquatint. The larger hidden bird has a very similar pose to the third loon in the print, yet it is located in a different spot and has an egg in its beak. The two smaller hidden birds are located roughly where the one in the aquatint is, but are much smaller, possibly even juveniles, as is the bird in the final rendition of the print. Even more interesting and possibly even more rare of a finding was a clear message underneath the painted reeds. After combining the near infrared (in the 1000-1700 nm range) and VNIR (400-1000 nm) bands, the contrast between the fine handwritten text and the visible outside oil painted layer was enhanced to make the words more legible. The note, presumably in Audubon's handwriting, appears to be a note to the printmaker, possibly Robert Havell, indicating what additions to make to the printed rendition. The hidden birds and text tell a fascinating story about Audubon's dynamic artistic process and collaboration with printmakers.

50 Dinosaurs live on: The Story of a West Indian Microfilm Collection

Nicole Lewis-Prawl, Dunstan Newman, Bernadette Worrell-Johnson

The University of the West Indies (UWI) Mona stands as one of the oldest academic institutions in the English-Speaking Caribbean. Situated on 252 acres of land, the Mona Campus boasts a rich cultural and historical legacy and this manifests in the diverse resources held in the UWI Mona Library's collection.

The UWI Mona library was established in 1948 at Mona as a part of the new University College of the West Indies. The library was moved in 1952 to the current site it occupies and is a very integral part of the campus. There are four other libraries which are the Science and Engineering, Medical, Law and the Western Jamaica campus branch libraries. The UWI Mona library is the main library on the campus

The UWI Mona Library houses a diverse collection, featuring books, photographs, maps, pamphlets, journals and microforms. Within the over 6000 microfilm/microfiche collections at Mona, is the opportunity to explore unique facets in the history of growth and development of Jamaica and the Caribbean from the 17th century to the mid to late 20th century.

Microforms are typically a durable preservation format and able to last up to a century under optimum conditions. Unfortunately, the Mona Library's collection has suffered from inadequate environmental conditions and is exasperated by limited financial resources. This has led to the onset of vinegar syndrome and mold exposure over the past decade.

In response, the library has undertaken collaborative initiatives with internal and external departments to preserve these valuable records. Efforts include partnering with the Estate Management Department to repair existing or acquire new air conditioning equipment and grant applications such as UNESCO's Memory of the World initiative to Safeguard Documentary Heritage at Risk. This grant aims to preserve and make accessible collections at risk due to diminishing or non-existent financing by providing equipment such as smart dehumidifiers and data loggers, which will help stabilize storage conditions. Additionally, the Library's Preservation Department launched a campaign to create protective enclosures to slow the deterioration of these records. This paper seeks to highlight the invaluable heritage held within this historic collection and efforts underway to ensure its preservation and continued access.

51 From Historical Practices to Modern Solutions: A Material Science Review for In-situ Underwater Cultural Heritage Conservation

Chongwen Liu

Over 20 years since in-situ preservation was established as the first option for managing underwater cultural heritage (UCH) in the 2001 UNESCO Convention on the Protection for the Underwater Cultural Heritage. The principal has found its success in the recent openings of artificial reefs, marine protected areas and archaeological parks across the world. Previous publications have provided comprehensive reviews of managing the UCH by large-scale projects through reburial, excavation or the establishment of the aforementioned designated spaces. However, the detailed description of conservation materials used in preventive or interventive treatment is often neglected in reviews, hindering the exchange of technical knowledge and the development of potential new UCH conservation materials. This research, for the first time, presents a holistic review and catalog of conservation materials involved in the treatment of underwater cultural heritage. Aligning with the authors' expertise, a material science perspective is taken to carefully evaluate their applicability and effectiveness and enlighten further material development. First, exhaustive literature research is performed using Google Scholar and OpenAlex, considering the search engines' inclusivity. As a specialized field of study, literature regarding underwater cultural heritage is not necessarily published in SCI journals (for which Web of Science search engine is often used) but is more commonly seen in conference proceedings or organizational guidelines. Bibliometric data are analyzed to represent trends in conservation

materials seen in preserving underwater cultural heritage and a breakdown of demographics in their development. Three types of substrates are focused on in the research: woods, metals and stones, which raise the most concerns during the interviews and represent a significant proportion of UCH. The conservation materials researched fall into three categories based on their function: protective coverings, consolidation agents and chemical degradation inhibitors, such as corrosion inhibitors. For each of these materials, their selection and application are documented and evaluated based on effectiveness, underwater applicability, environmental impact and cost/accessibility. Climate change is posing significant threats to our UCH, through, for example, a rising sea level, ocean acidification and extreme weather events. Contrarily, UCH preservation projects are often operating under a tight budget. This project presents a first attempt to resolve the dilemma by knowledge-sharing, expanding the practitioners' toolbox with material science-proven options.

52 Collaborative Techniques in the Preservation of Saad Zaghloul Pasha's Photographic Archive

Rasha Shaheen

The photographic archive of Saad Zaghloul Pasha represents a vital component of Egypts cultural and historical heritage. This paper explores the collaborative methods employed in the preservation and documentation of this 19th-century albumen archive, housed at the Saad Zaghloul Museum in Cairo. The focus is on the integration of digitalization efforts, conservation techniques, and the joint efforts of conservators, digital technologists, and historians to address the challenges posed by the deterioration of these fragile photographic materials. The study underscores the significance of interdisciplinary collaboration in ensuring the preservation of these important artifacts and their accessibility to future generations.

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