ICOM-CC
Scientific Research Working Group Newsletter

INTERNATIONAL COUNCIL OF MUSEUMS
ICOM-CC

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On the cover: A Romano–Egyptian mummy portrait of a woman named Isidora, as written on what remains of the painted linen wrappings. Stylistically dated to the early 100's A.D. based on her braided hairstyle and corroborated by radiocarbon dating, the portrait depicts a woman of high social status. The use of gold and imported wood and pigments in its fabrication further supports this dating. © J. Paul Getty Museum. See Marie Svoboda article on page 3.

Publication Coordinators: Joy Mazurek and Gary Mattison

ICOM
The International Council of Museums (ICOM), created in 1946, is the world organization representing museums and museum professionals, committed to the promotion and protection of natural and cultural heritage, present and future, tangible and intangible. With approximately 30,000 members in 137 countries, ICOM is a unique network of museum professionals acting in a wide range of museum-and heritage-related disciplines.

ICOM-CC
The Committee for Conservation of ICOM (ICOM-CC) aims to promote the conservation of culturally and historically significant works and to further the goals of the conservation profession. With over 2000 members, ICOM-CC is comprised of twenty-one specialist Working Groups, which actively communicate with members through newsletters, meetings, and at the Triennial Conference. The Coordinators of these Working Groups and the members of the Directory Board are conservation professionals who are elected to their posts by the general membership and who donate their time to ICOM-CC over a three-year cycle. http://www.icom-cc.org/.

The **Scientific Research Working Group** of ICOM-CC is a venue to discuss in detail new research technologies and methodologies across many types of materials and collections. Application of methods and techniques for specific materials or objects are considered in the appropriate ICOM-CC working group. The areas of interest of the Scientific Research Working Group include: material degradation studies; non-invasive analysis and characterization; portable instrumentation, sensors and dosimeters; scientific methods for dating, provenancing and authentication; and statistics, modeling and chemometrics for cultural heritage. By exploring heritage materials, their construction, and mechanisms of deterioration, we aim to improve the conservation of moveable and immoveable heritage.

ICOM-CC
Scientific Research Working Group Newsletter

WELCOME!

Greetings, all!

I'm pleased to introduce myself as the new ICOM-CC Scientific Research Working Group Coordinator, and happy to welcome you to our first-ever Working Group Newsletter!

There has been growth over the last decade in the number of meetings specializing in conservation science, so much so that we now have to agonize over which ones to attend: those with an instrumental focus like IRUG or MaSC; or those which have a wider scientific appeal like the Gordon Research Conferences. But ICOM-CC is one that I plan to attend every time, because it not only allows for a diverse scientific sessions, it brings together conservators and colleagues from around the world in one place at one time. And, it connects science and art in a coherent way, especially in the joint working group sessions. It also allows for invigorating discussions with colleagues and for collaborations to form. And lastly, it takes place in locations that I may never have had the opportunity to visit previously, and so I get to learn about art in a city that is all new to me.

Last September, Melbourne hosted the ICOM-CC 2014 Triennial Meeting, which began with a moving welcome to the country by Aunty Joy Wandin Murphy, Senior Wurundjeri elder of the traditional custodians of the land where the meeting took place. It was wonderful to revisit Melbourne and see how much it has changed, or not: it can still boast the best Greek food outside of Athens. The National Gallery of Victoria's Federation Square showcased exquisite Aboriginal paintings, something we do not see enough of in other parts of the world. The new Convention and Exhibition Center was first–rate, as was the organization and the refereed papers. We were spoiled for options with the concurrent sessions, and we all had to make hard choices. The Scientific Research Working Group covered a wide range of subjects, from the materials and techniques of Aboriginal artists to the effects of vapor pressure on varnish dissolution.

Narayan Khandekar

Austin Nevin has stepped down as Coordinator of the Scientific Research Working Group but remains an Assistant Coordinator. Joy Mazurek from the Getty Conservation Institute and Bronwyn Ormsby from Tate are new Assistant Coordinators. Together we have a very strong team to take you through to the next Triennial Meeting in Copenhagen in 2017.

The ICOM-CC Scientific Research Working Group and Technart co-hosted an interim meeting in Catania, Sicily in April 2015. Austin, one of the organizers, has written a review which can be found on page 7 of this newsletter. A second interim meeting on Conservation Science and Education is in the planning stages and will be held at Harvard University on April 13-14, 2016. We want to explore education in a wide variety of ways, including the education of conservation students, conservation science students, post–docs, fellows, curators and art historians, directors, donors, and the media. One of the most important aspects of our work is sharing what we know to non-specialist audiences; our profession depends upon it. We are not planning any publication in the anticipation that a less formal environment will encourage active presentations and discussions. The conference will be for two days including one half-day visit to nearby conservation labs. The Association of North American Graduate Programs in Conservation (ANAGPIC) will hold their annual conference immediately following the interim meeting, also at Harvard University, and it will be open to delegates who want to sit in on the talks, an unusual treat. A call for abstracts for the interim meeting will be made shortly.

We have included some reviews of conferences and updates of projects in this newsletter. We are hoping that you will be encouraged to write some of your own articles for next year's newsletter. We look forward to receiving your input and ideas!

With best wishes,

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RESEARCH TOPICS

APPEAR: Ancient Panel Paintings, Examination, Analysis and Research

In 2013, the Antiquities Conservation Department at the J. Paul Getty Museum launched a four-year collaborative study and online database along with a number of major museums around the world to better characterize the material makeup and manufacture practices of ancient mummy portraits from Roman Egypt. The potential for increasing our understanding of the materials and techniques used for these ancient painted portraits, and the development of the database, will offer a new model of online data–sharing among scholars worldwide.

Getty Conservation Institute scientist Joy Mazurek conducts a technical study of a mummy portrait for the APPEAR project, involving examination, imaging and, when necessary, sampling for analysis.

The APPEAR project encourages close collaboration of its current team of twelve partner institutions; technical support from the Getty Conservation Institute (GCI) and the University of California Los Angeles (UCLA); and the guidance of thirteen advisory consultants from different backgrounds such as Egyptology, science, ancient historians, and artists. APPEAR will explore a broad range of techniques, such as imaging and scientific analysis, to better understand the materials, their characteristics, and methods of application. By reviewing the information in the database, participants can provide direction, make observations, raise questions, and recognize parallels and anomalies as the project develops. The collaborative aspect of APPEAR is also intended to encourage the open exchange of technical and scientific support.

Participants at an APPEAR project meeting in 2013 at the Getty Museum discuss the materials and fabrication technology of a mummy portrait in the Museum's collection.

The database created for this project guides the participants through data entry within the required fields to ensure consistency of the information added. The database keeps track of individual projects as they evolve and enables searches, comparisons and reviews of progress. Ongoing dialogue and periodic meetings among participants will culminate with a scholarly congress scheduled for 2017. The congress will report on information obtained from the project, explore future areas of study, and produce focused research papers that will be available as a scholarly online resource after the completion of the project.

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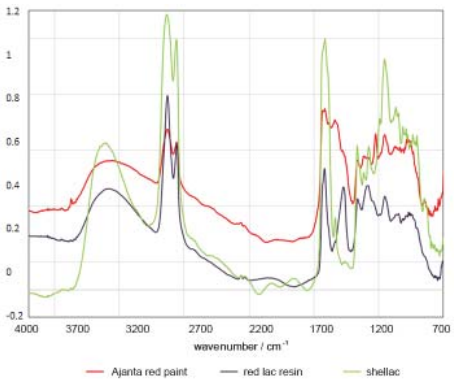
Identification of resinous red colorants extracted from lac in Asian wall paintings and reliefs

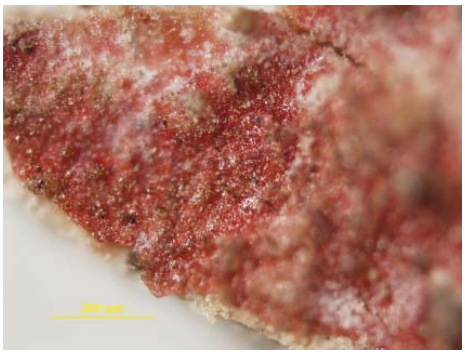
In September, 2014, SPring–8 in Japan, one of the world's largest Synchrotron facilities, began offering prioritized access to beam lines relating to materials of social interest, including cultural heritage and archaeological subjects (www.spring8.or.jp/en/users/announcements/priority_social/). SR-based X-ray analyses have already spurred remarkable results through the characterization of materials such as ancient glasses; bronze-iron 'bimetallic' swords from Luristan; pipe-shaped red ochre from prehistoric and ancient sites; and coloring mechanisms found in Neolithic artificial blue beads.

Samples from paintings typically provide only a limited amount of material for identification. Moreover, paintings have stratigraphic structures that make it difficult to separate layers and analyze the composition of each layer. Cross–section examination is one method for overcoming such a difficulty; μFTIR analysis is frequently applied for organic materials. In many cases, however, the thickness of a paint layer may be too thin for the special resolution of a lab-based μFTIR. In such cases, SR-μFTIR, with its narrow beam of approximately 10 microns, demonstrates a great advantage by allowing for the analysis of even minute sample amounts.



FTIR specta of red paints and shellac (obtained at SPring–8, beamline BL43IR). © ASI/NRICPT.

Cave 2, within the Ajanta caves of India and decorated with magnificent polychromed basalt reliefs and wall paintings, is currently being studied in an ongoing research project on wall paintings in Asia. Its late fifth-century AD reliefs contain a translucent reddish colorant that shows a strong reddish-pink fluorescence under 360nm UV radiation. Similar reddish colorants have been found in other Asian wall paintings, such as in Cave 224 of the Kizil grottoes.



From Ajanta Cave 2: light microscopy image of the red paint surface. © ASI/NRICPT.

UV-VIS measurements and FTIR spectra taken of a red paint sample from Ajanta's Cave 2 revealed the presence of a lac-based red resinous material. This material was then reproduced by postulating a connection to historical Indian and Iranian inks and utilizing historical recipes that included boiling the stick lac and dissolving it with borax, a natural alkali. Such processes give us new insight into the manufacture of organic lac-made red paint in ancient Asia.

Reference:
K.S. Rana and K. Yamauchi (eds). Indo-Japanese Research Project for the Conservation of Ajanta Paintings—Conservation and Scientific Investigation of the Paintings of Ajanta Caves 2 and 9 (2009-2011). Archaeological Survey of India and National Research Institute for Cultural Properties, Tokyo. March 2015.

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Binders and pigments used in traditional Aboriginal bark paintings

In conjunction with the upcoming exhibition Everywhen: The Eternal Present in Indigenous Art from Australia, Narayan Khandekar and Georgina Rayner (the Straus Center for Conservation and Technical Studies, Harvard Art Museums), and Dan Kirby (an independent conservation scientist), have conducted a major survey of the pigments and binders used in traditional Aboriginal bark paintings from Arnhem Land, Groote Eylandt, the Kimberley and the Tiwi Islands.

Steve Anderson (left) and Gordon Pupangamirri (right) from Tiwi Design with Stephen Gilchrist (center), curator of "Everywhen: The Eternal Present in Indigenous Paintings from Australia" collecting white ochre on Bathurst Island.

Paints were analyzed for: 1) binding media using Fourier transform infrared spectrometry (FTIR) and pyrolysis gas chromatography mass spectrometry (Py-GC/MS); and 2) pigments by laser ablation–inductively coupled plasma-mass spectrometry (LA-ICP-MS) to determine if an elemental fingerprint could be identified. Approximately two hundred samples from fifty paintings were analyzed from Museum Victoria; The Ian Potter Museum of Art, the University of Melbourne; the National Gallery of Australia; Art Gallery of New South Wales; the Australian Museum; National Gallery of Victoria; the Macleay Museum, The University of Sydney; and the Peabody Museum of Archaeology and Ethnology, Harvard University. The following art centers provided standard pigments and binders: Buku Larrnggay Mulka, Yirrkala, Northern Territory; Tiwi Design, Bathurst Island, Northern Territory; and Warringarri, Kununurra, Western Australia.

Binders were present in 77% of the samples we analyzed. No proteins, waxes, fats or blood were detected as a binder. The presence of nitrocellulose on Groote Eylandt paintings was connected to records from the 1948 expedition, linking the condition of the paintings to a consolidation application of Duco. Orchid juice was chemically identified as a binder in a painting for the first time, and was identified in the oldest bark paintings dating to pre-1878.

A deposit of yellow ochre from Bathurst Island.

The use of a variety of blacks from Groote Eylandt was identified as originating from natural manganese ore, dry cell batteries and charcoal. The differences in elemental fingerprints between ochres of the same location, as well as from painting samples, indicates that more studies are required on a local level to determine the source and movement of ochres. A collaboration in the characterization of ochres has developed with Rachel Popelka–Filcoff and Claire Lenehan from Flinders University. Samples analyzed by neutron activation are being analyzed by LA-ICP-MS and vice versa in an attempt to correlate the results from the two different techniques. Here is a link with more information: (http://www.harvardartmuseums.org/visit/exhibitions/4983/everywhen-the-eternal-present-in-indigenous-art-fromaustralia)

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JPI-Cultural Heritage ArCo Project: An Aging Study of Treated Composite Archaeological Waterlogged Artifacts

List of participants: University of Oslo; National Museet of Denmark; ARC-Nucléart; University of Pisa; and ARCHA Pisa

Museums and prominent preservation workshops around the world specializing in the treatment of archaeological organic materials have been confronted in recent years with a phenomenon of "leprosy," or rashes which appear after treatment on wet wooden archaeological objects due to the presence of unstable salts. After drying the object by air contact, salt compounds oxidize to cause swelling and cracking of the wood, leading to a catastrophic acidification of the object.

A prime example of an acidic attack on wood is the famous Swedish warship Vasa, housed in the Vasa Museum in Stockholm (www.vasamuseet.se/en/). A similar example is the Oseberg Collection (www.khm.uio.no/english/visit-us/viking-ship-museum), the most important archaeological find in Norway. In the 1920s, many of the objects in the collection were immersed in a solution of hot alum salts, causing major damage. Other European countries have experienced similar problems in their own collections and have begun to consider alternative treatment options.

The ArCo project aims to develop systems to choose the most suitable treatments to limit or even eradicate the oxidation of salts on wood. But how does one evaluate all the numerous treatments proposed by the scientific and professional communities? There is no one answer, because the long-term behavior of unstable concretions using different consolidants and/or bulking agents is not yet well-known.

Therefore, the ArCO project seeks to develop original characterization protocols to assess available treatments, especially the more hydrophobic ones. The experimental campaign is made from composite sampling of archaeological wood artifacts in different conditions: treated with different protocols, or humid state not yet treated.

Current archaeological findings under investigation include: the alum-treated wood from the Oseberg collection (Norway); the "L'Aimable Grelot", the Roman river barge of Lyon (France), originally treated with PEG and then post-treated with a solution of PEG 20% and disodium sebacate 10%; and the Skuldelev and the Nydam ships (Denmark), respectively treated with PEG 4000 and PEG 2000.

An example of efflorescence in archaeological waterlogged wood.

A wide range of analytical techniques are being used to investigate both the organic and the inorganic components present in these treated composite archaeological wooden artifacts: pyrolysis coupled with gas chromatography and mass spectrometry (Py–GC/MS); infrared spectroscopy (FTIR); scanning electron microscopy-energy dispersive X-ray analysis (SEM–EDX); X-ray fluorescence (XRF); X-ray diffraction (XRD); and inductively coupled plasma optical emission spectroscopy (ICP-OES).

Analyses have been performed on archaeological wood samples "as they were", and repeated after about a year of aging in a climate chamber under extreme conditions. A full diagnostic of the degradation level of composite objects was performed. Biomimetic materials, such as bakelite, crystalline cellulose, chitosan, and synthesized lignin were taken into consideration as possible wood consolidants [1,2].

ARC-Nucléart (Grenoble) studied fatty acid systems with the aim of stabilizing soft degraded archaeological wood [3,4]. A common aspect of these innovative materials is that no available aging studies exist: providing them is one of the main goals of the ArCo project.

The project will ultimately make recommendations for choosing the most relevant conservation treatments, suitable for use on unstable composite materials in cultural heritage collections.

1 Christensen, M., H. Kutzke, and F.K. Hansen, New materials used for the consolidation of archaeological wood - past attempts, present struggles, and future requirements. Journal of Cultural Heritage, 2012. 13(3): p. S183–S190.

2 Kutzke, H. and S. Braovac, Conservation of archaeological wood: the Oseberg find, in Yearbook of Science and Technology, J. Rennie, et al., Editors. 2013, McGraw-Hill. p. 89-92.

3 Chaumat, G., L. Blanc, and C. Albino. Development of new consolidation treatments from fatty acid resin solution. in Proceedings of the 10th ICOM-CC Group on Wet Organic Archaeological Materials Conference. 2007. Amsterdam, The Netherlands.

4 Chaumat, G., L. Blanc, and C. Albino. Study of the azelaic/palmitic acids association to treat waterlogged archaeological wood. in Proceedings of the 11th ICOM-CC Group on Wet Organic Archaeological Materials Conference. 2010. Greenville, North Carolina.

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European Lacquer in Context (ELinC): art-historical, technological and chemical characterization of European lacquer in Federal collections

Lacquered objects began to be imported from Asia to Europe in the sixteenth century. Their immense popularity inspired European craftsmen to imitate these luxury products employing their own familiar materials and techniques. Many of these lacquer recipes have survived, using combinations of various natural resins, including sandarac, shellac, copal and mastic; with additives such as elemi and gamboge. Although the basic raw materials used differ strongly—true lacquer in Asia and natural resins available in Europe—the final aspects of European lacquers closely resemble those of their Oriental equivalent.

Through the study of historical sources and physico-chemical analysis of museum objects and reconstructions, the European Lacquer in Context project (ELinC) aims to illuminate the history, techniques, materials and degradation phenomena of European lacquer. The four-year project (2014-2018) focuses on its technological history, with special attention given to a selected number of japanned objects in the collections of the Royal Museums of Art and History in Brussels (RMAH).

French craftsmen were commissioned to add a lacquered base and gilt bronze mounts to Chinese porcelain wine cups and figures, creating this inkstand in the J. Paul Getty Museum Collection. In the 1700s and earlier, writers sprinkled sand on wet ink to speed drying.
© J. Paul Getty Museum

The lacquers will be characterized by joint efforts of art-historical, technological and chemical research.

The project is funded by the Belgian Research Action through Interdisciplinary Networks (BRAIN.be), a framework program for research, which is part of the Belgian Science Policy Office (BELSPO). This multidisciplinary project involves three Belgian partners and one foreign partner: the Royal Institute for Cultural Heritage (KIK-IRPA, Brussels); the University of Antwerp (UA, Antwerp); the RMAH; and the Getty Conservation Institute (GCI, Los Angeles).

A large volume of information will be acquired during the project: old recipes, data on ingredients used, results of scientific analyses, art-historical data, data on the objects from the RMAH collection to be studied, and so on. In order to manage all these data, and to facilitate sharing the information between the different partners (and in a later phase, with the scientific community), a web application has been developed.

Emphasis is placed on the functionality of the database, allowing flexible search and adding data within the database. The database is designed to take into account the needs from ELinC partners working in different scientific disciplines. Data will be continuously added to the database by the partners as the project progresses.

By combining research on art-history, chemistry and technology, the ELinC project will shed new light on the tradition of European lacquering. Researchers of different disciplines will inspire each other in the exploration of historical recipes, objects and documents.

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CONFERENCE REVIEWS

Subliming Surfaces: Volatile Binding Media in Heritage Conservation
April 15–16, 2015
Cambridge, United Kingdom

Organized by the University of Cambridge Museums, this conference provided the first opportunity for the profession to gather, share papers and posters, and discuss volatile binding media (VBM), principally cyclododecane (CDD). Combining invited and submitted papers and posters, participants came from Europe, the United Kingdom, and the United States. Attendees were presented with critical reviews of use; current research; and case studies from a broad range of conservation disciplines.

The conference began with an overview presented by the organizers, "Subliming surfaces: the first 20 years." The program was then divided into sections. Reviews of VBM's in practice featured case studies of use (mainly CDD) in archaeological fieldwork; the cleaning of fossil vertebrates; wall painting and fresco conservation; easel painting consolidation; textiles, book and paper conservation; archaeological ceramics desalination; and the mounting of sensors in historic buildings. *VBM's under scrutiny* discussed chemical purity; the sublimation rate and its relation to paper characteristics; the consolidation of ceramics to be desalinated; and long-term use in archaeological contexts, and as an enhancement for tetrahertz imaging of frescoes.

Many presentations raised questions of *health, safety, and environmental concerns*, and the talks presented in this well attended section generated much discussion. The speakers pointed out CDD's low persistence in the environment, the difficulty of bioaccumulation sufficient to be a hazard, lack of mutagenic or eco-toxic effect, and lack of

toxicity to humans. Nevertheless, the conservative nature of, well, conservators, caused many to remain concerned about possible risk, particularly due to fairly relaxed suggestions regarding personal protective equipment (PPE) and ventilation.

The poster presentation, containing many worthy presentations, was well attended.

Highlights of the conference were its meticulous organization and the determination of the organizers, Christina Rozeik and Sophie Rowe, who made sure there were generous opportunities for questions and discussion between talks as well as extended conversations throughout the day, at meals and during breaks.

Standouts were guest lecturers Hans Hangleiter and Leonie Saltzmann, who presented "20 years of Volatile Binding Media." Hangleiter was part of the original German group which first developed the use of volatile binding media in conservation in the early 1990s. They discussed these origins, less well-known alternatives to cyclododecane, and ingenious uses for these materials that they have developed in their conservation practice.

The lecture was followed by a reception in the Fitzwilliam Museum and private view of the exhibition, *Treasured Possessions from the Renaissance to the Enlightenment.*

The conference concluded on Friday with conservation lab tours and a half-day practical workshop on the use of cyclododecane and other VBM's. The workshop was so well attended that an additional session was added to meet the demand. Participants had the opportunity to try cyclododecane with a variety of tools in a range of situations across conservation disciplines. Afterwards, experiences were shared at a cozy wrap-up session over tea. Altogether, this was one of the most practically useful and well-organized conferences I've attended. The collected postprints will be presented in an online publication, and should prove to be essential reading for conservators from many disciplines.

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TECHNART 2015
April 27–30, 2015
Catania, Sicily
Non-destructive and micro-analytical techniques in art and cultural heritage

TECHNART 2015 was organized by LNS–INFN, IBAM-CNR, and the University of Catania (Dipartimento di Scienze Chimiche), jointly with the ICOM–CC Scientific Research Working Group and the Italian Association of Archaeometry (AIAr). Chaired by Paolo Romano, Giuseppe Spoto and Austin Nevin, with support from the international Permanent Scientific Committee and Local Scientific Committee, the conference took place April 27–30, 2015 in Catania, Italy, at one of the largest former Benedictine monasteries in Europe in the center of Catania.

The city of Catania in Sicily provided a lovely backdrop for the TECHNART 2015 conference.

The aim of TECHNART 2015 was to provide a scientific forum to present and promote the use of analytical spectroscopy techniques in the field of cultural heritage. The conference built on previous TECHNART editions of Lisbon, Athens, Berlin and Amsterdam, and offered an outstanding and unique opportunity for exchanging knowledge on cutting edge developments in the following fields:

X-ray microanalysis (XRF, PIXE, XRD, SEM-EDX)
Confocal X-ray microscopy (3D Micro-XRF, 3D Micro-PIXE)
Synchrotron, ion beam and neutron based techniques/instrumentation
FT-IR and Raman microscopy
UV-Vis and NIR absorption/reflectance and fluorescence
Laser–based analytical techniques
Magnetic resonance techniques
Chromatography (GC, HPLC) and mass spectrometry
Optical imaging and coherence techniques
Mobile spectrometry and remote sensing

The book of abstracts (see link below) is a testament to the range and depth of work presented at TECHNART 2015.

TECHNART attendees enjoyed a conference dinner at the magnificent Palazzo Biscari in Catania.

By all measures, TECHNART 2015 was a resounding success: a high level of innovative scientific presentations combined with a wonderful setting. Many ICOM-CC Scientific Research Working group members attended, with overall participation totaling 518 people from 51 countries (a conference attendance record). Support from many sponsors provided travel grants for participation from third world countries; and the many young scientists attending and presenting at the conference were an inspiration to all and a strong indicator for the future of Conservation Science. In addition to four full days of over one hundred plenary and oral presentations and over 350 posters, a rich social program culminated in an exquisite confer-

ence dinner at the magnificent Palazzo Biscari, in addition to day tours to the breathtaking sites of Taoromina and Siracuse.

A virtual special issue in Microchemical Journal is currently under preparation of critical reviews or full research papers and present original, unpublished work focusing on analytical and bioanalytical themes presented at TECHNART2015. The papers from the special issue should be online before the end of 2015.

We look forward to the next Technart Conference, to be held in September 2017 in Bilbao, Spain (details to follow).

Images from the Conference: (www.facebook.com/media/set/?set=a.834446233275898.1073741889.481396421914216&type=3&uploaded=417)

Website of the Conference: http://technart2015.lns.infn.it/

Book of Abstracts: (http://technart2015.lns.infn.it/images/BoA.pdf)

Links to coverage of the Conference online: (http://cen.acs.org/articles/93/i21/Taste-Artful-Science.html)

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WORKSHOP REVIEWS

The 7th Workshop and Meeting of the Users' Group for Mass Spectrometry and Chromatography (MaSC)
May 17-22, 2015
Chicago, Illinois

The proceedings began with the three-day workshop hosted by the Art Institute of Chicago, Northwestern University, the Field Museum and Agilent Technologies. It differed from previous sessions, focusing on the application of mass spectrometry for the analysis of inorganic materials. It also included sessions on the application of isotopic analysis.

The workshop was divided into a series of morning lectures which focused on the theory of MS for inorganic materials and isotopic analysis, followed by presentations of a wide range of interesting case studies. In the afternoon there were hands-on practical sessions in the laboratory. The organizers, Marc Walton and Ken Sutherland, gathered together an impressive suite of international experts as instructors, including Patrick Degryse (Leuven University Belgium); Andrew Shortland (Cranfield University, United Kingdom); Marc Walton, Monica Ganio and Alain Potrel (Northwestern University); Laure Dussubieux and Mark Golitko (The Field Museum); and Jon Talbott (Agilent Technologies).

The lectures spanned a wide range of materials and case studies, including Bronze Age and Roman glass, Athenian ceramics, medieval paintings, and sixteenth to eighteenth century American copper alloys. Participants were then divided into three groups for the laboratory sessions which were held at the three widely separated host sites.

The laboratory sessions were unified through a common question: could samples of lapis lazuli (and hence ultimately natural ultramarine) be sourced, and what would be the best technique for this? At Agilent Technologies, Jon Talbott showed the group how to analyze lapis lazuli from diverse geological sources using solution inductively coupled plasma mass spectrometry (ICP-MS), followed by a discussion on how to examine and process the data. This hands-on exercise highlighted the problems with dissolution of the various phases in natural lapis lazuli and the need for careful selection of the best acids and analytical conditions.

At the Field Museum, Laure Dussubieux demonstrated how to undertake laser ablation ICP-MS on samples of lapis lazuli with minimal sample preparation and then demonstrated to the group how they could run LA-ICPMS samples themselves. The demonstration showed how difficult it can be to identify the different phases in the samples, and how results will differ from phase to phase. At the radiogenic isotope laboratory at Northwestern University, Monico Ganico and Alain Potrel demonstrated the meticulous preparation required for isotopic samples and gave the groups the opportunity to suit up and prepare samples in the "clean room."

The laboratory sessions were drawn together by Mark Golitko at the Field Museum, who provided a hands-on session on statistical processing of the analytical data and how to decide which statistical techniques were the most useful and appropriate. The mixture of theoretical lecture-based sessions and hands-on practical sessions provided the perfect combination for learning about the application of MS techniques to inorganic analysis. All the participants left with a much better understanding of both the advantages and difficulties of analyzing natural inorganic materials.

The three-day workshop was followed by the larger and more formal two-day MaSC meeting, held at the Art Institute of Chicago. The first day continued the theme of inorganic and isotopic analysis, allowing this research to be presented to a wider audience. This was followed by sessions which returned to the more traditional range of MaSC presentations, focusing on organic materials and their degradation. Presentations within the inorganic and isotopic sessions ranged from provenancing of glass and silver to understanding the onset of dairying and correlating radiocarbon dating

with traditional ancient Egyptian chronologies.

MaSC Workshop and Meeting Participants

The organic sessions included presentations on the degradation of modern materials, such as cellulose acetate; the characterization of plant gums and proteins (including those from human skin) in a wide range of art works and books; analysis of Asian and European lacquers; and analysis of binding media from medieval paintings to nineteenth and twentieth century art works. The combination of inorganic and organic MS and the diversification of the group was welcomed by all participants and will hopefully continue in future meetings.

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UPCOMIMG MEETINGS

Colore e Conservazione VII Congresso Internazionale
November 13-14, 2015
Politecnico di Milano, Italy
(www.coloreeconservazione2015.com)

Eastern Analytical Symposium (EAS) and Exposition
November 16-18, 2015
Somerset, New Jersey
http://eas.org/

Materials Research Society Fall Meeting & Exhibit
November 29 - December 4, 2015
Boston, Massachusetts
http://www.mrs.org/fall2015/

AAAS Annual Meeting
February 11 -15, 2016
Washington, DC
(http://meetings.aaas.org/washington-dc/#sthash.G184Kcf9.dpuf)

Pittcon 2016
March 6-10, 2016
Atlanta, Georgia
http://pittcon.org/exposition/

American Institute for Conservation (AIC) 44th Annual Meeting
May 13-17, 2016
Montreal, Canada
http://www.conservation-us.org

41st International Symposium on Archaeometry
May 15-20, 2016
Kalamata, Greece
http://isa2016.uop.gr/

IRUG12 Biennial Conference
May-Early June, 2016
Ormylia, Chalkidiki, Greece
http://www.irug.org/

6th MCA4CH Mediterranean Meeting
June 12-15, 2016
Parma, Italy
http://www.cma4ch.org/index2.html

Gordon Research Conferences: Scientific Methods in Cultural Heritage
July 31–August 5, 2016
Newry, Maine, USA
http://www.grc.org

International Institute for Conservation of Historic and Artistic Works (IIC) Los Angeles Congress
September 12-16, 2016
Los Angeles, California, USA
(https://www.iiconservation.org/node/5586v)

UPCOMIMG WORKSHOPS

RAdICAL on Tour!
Spring 2016
Amsterdam, The Netherlands

The Getty Conservation Institute, the Dutch Cultural Heritage Agency (RCE) and the Rijksmuseum in Amsterdam are pleased to announce the fourth workshop of the 'Recent Advances in Characterizing Asian Lacquer' (RAdICAL), to be held at the Atelier Building in Amsterdam (exact dates to be announced).

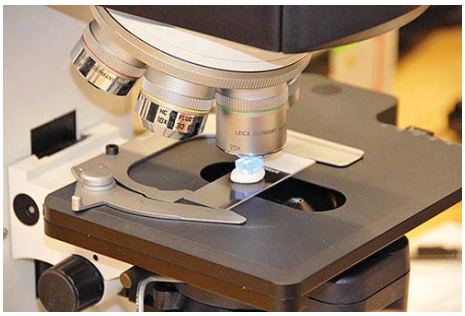
GCI senior scientist Michael Schilling (right) reviews Py-GC/MS results with workshop participants using AMDIS software.

The RAdICAL workshop offers a unique opportunity to explore recent developments in the analysis of organic materials in Asian lacquers and beyond. The developments are so powerful and surprising that it will likely change the way one approaches an object or sample. The information provided and training techniques are not only applicable to Asian Lacquers but also to European lacquers, paintings and furniture.

Conservators and scientists work together in research teams to prepare and test samples of historic lacquers, which conservators bring with them.

This workshop provides a unique opportunity for scientists and conservators to work together in close collaboration, facilitating dialogue on such diverse topics as understanding compositional variations in lacquered

objects made in different countries and time periods, identifying research priorities, opportunities for collaboration, and exploring the relevance of analytical research to the conservation of lacquered objects.



Examining layer structure in a lqcquer cross section using UV-fluorenscence spectroscopy.

Information on how to register for the next RAdICAL workshops will be posted on various conservation websites later this year.

For additional information on the RAdICAL workshops, please use this link: (http://www.getty.edu/conservation/our_projects/education/radical/index.html)

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JOB POSTINGS

Senior Scientist
Detroit Institute of Arts

(www.dia.org/employment/1747/Andrew-W-Mellon-Senior-Conservation-Scientist.aspx)

OTHER NEWS

Modern Oils Research Consortium (MORC)

Twentieth- and twenty-first-century oil paintings and painted surfaces present a range of complex treatment challenges to conservators that are distinct from those noted from previous centuries. These include the formation of 'surface skins' of medium on painted surfaces, efflorescence, unpredictable water and solvent sensitivity and the recent phenomena where previously stable surfaces begin to drip.

Modern oil paints are used by artists in the creation of paintings and sculpture and many of these surfaces are unvarnished and exposed directly to the environment. In response to the need for research in this area, Tate, the Courtauld Institute of Art, the Getty Conservation Institute, the Cultural Heritage Agency of the Netherlands and Hamilton Kerr Institute have come together and committed to work collaboratively to address these issues.

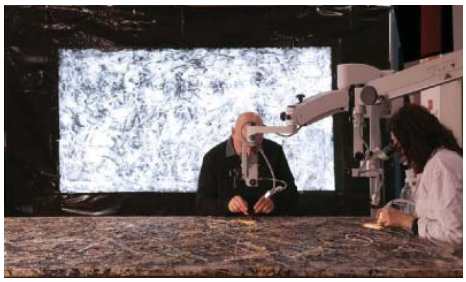
As part of the Modern Oils Research Consortium, Aviva Burnstock, professor at the Courtauld Institute of Art, examines historic Winsor & Newton artists' oil paints, which belong to Tate. Photo: Gary Mattison

(http://www.tate.org.uk/about/projects/modern-oils-research-consortium)

IPERION CH (Integrated Platform for the European Research Infrastructure ON Culture Heritage)

The IPERION CH consortium is determined to take up the challenge outlined in the Horizon 2020—Work Programme 2014–2015 for European research infrastructures, which calls for the establishment of a unique European research infrastructure for restoration and conservation of Cultural Heritage, encompassed in this proposal by the term Heritage Science.

IPERION CH consists of twenty-three partners from twelve member states plus one partner from the U.S., together with a large network of affiliations and collaborations. The consortium joins together major centers of research in heritage science, including outstanding research institutes, prestigious research laboratories, and conservation centers at both museums and universities.



*Jackson Pollock's "*Alchemy*" restored by the Opificio delle Pietre Dure in Florence, after the analysis campaign by MOLAB. © Opificio delle Pietre Dure. © Peggy Guggenheim Museum.*

The consortium's high reputation arises not only from its facilities but also from the international reputation of the scientists within them whose research combines technical expertise with great historical knowledge of material cultural heritage of all types.

IPERION CH is also affiliated with the Digital Research Infrastructure for the Arts and Humanities (DARIAH ERIC, www.ehri-project.eu/launching-dariah-eric-arts-and-humanities-go-digital represented in the consortium by INRIA. www.iperionch.eu