

## METALS WORKING GROUP NEWSLETTER

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### FROM THE COORDINATOR

Dear Metals Working Group Members and Friends,

I hope everyone had a good and restful holiday. It is with great pleasure that I welcome you to the first newsletter of the Triennium that will serve as an introduction to the new coordination team and give a short update on our activities.

Planning ahead and continuing to function in the midst of a global pandemic has certainly been a bumpy road for all of us, paved with uncertainties. Working in isolation, travel restrictions, missing family, friends and colleagues has taken a toll on all of us. Hopefully this change of pace has given you an opportunity to complete a book chapter, prepare a new teaching curriculum or get started on a new research idea.

The ICOM-CC Triennial Conference in Beijing that was scheduled to be held in September 2020 was pushed back due to the pandemic and took place virtually in May 2021. The conference was a huge success despite all the challenges of organizing such a huge virtual event. While we will always regret not meeting our Chinese colleagues in person and visiting this amazing country, the experience and spirit of camaraderie

among all participants - was palpable. The virtual setting made it easy to shoot from one session to another in seconds, which was quite wonderful, considering the parallel sessions.

The Metals Working Group was well represented in Beijing, and I would like to thank the previous coordination team, the organizing committee, our colleagues from all over the world, and all the authors for their hard work. All the conference papers are freely available on the ICOM-CC Publications Online website: [www.icom-cc-publications-online.org/](http://www.icom-cc-publications-online.org/)

The call for papers and posters for Metal 2022, the next Interim Meeting of the Metals Working Group to be held in Helsinki Finland, were met with an unprecedented response from authors of 37 countries, as well as strong interest from young conservation professionals. Our program committee was thrilled by the quality and variety of the submissions, and we look forward to sharing the final conference program with you as soon as possible. We remain focused and hopeful that an in-person meeting will be possible. However, Metal 2022 will be a hybrid meeting, meaning that it will occur virtually regardless of whether we meet in person in Helsinki. Stay tuned for updates in the new year.

The next ICOM-CC Triennial Conference will be held in Valencia Spain in September 2023. I encourage you to start thinking about submitting a paper and/or joining us in Spain!

Please consider submitting an article, announcement, short project, or news item for this newsletter to share with colleagues! Short articles about current research or book reviews are also welcome. See page 14 for more information.

Thank you to Assistant Coordinators Nicola Emmerson and Vandana Singh for producing this beautiful Newsletter and the coordination team at large for their support and assistance.

With my warmest regards and best wishes for 2022.

Paul Mardikian

[paul@terramareconservation.com](mailto:paul@terramareconservation.com)



*Metals Working Group Coordinators incoming (Paul Mardikian - left) and outgoing (Claudia Chemello - right)*

## INTRODUCING THE ASSISTANT COORDINATORS

### Jerrad Alexander



I am an objects conservator specializing in aerospace objects and other large technology having served in the U.S. Air Force as an Aircraft Armament Systems Specialist and Flight Engineer. My introduction to the field of conservation was as a technical consultant on the Apollo F-1 Engine Recovery and Conservation project where my expertise in aerospace systems, engineering, and mechanics aided the conservation team. Fascinated by the work of the conservators, I stayed on as a Conservation Technician until the project's completion. Afterward, I attended graduate school at the University of Melbourne, Australia, completing a Masters of Cultural Materials Conservation and interning at the Australian War Memorial. At the National Air and Space Museum, I use my training and experience to help preserve the museum's unique collection of aerospace heritage.

### Valentin Boissonnas



I was born amongst jars of turpentine and starch into a paintings and paper conservation dynasty. As teenagers do, I rebelled and became a conservator for those lesser archaeological and ethnographic objects - the punk rock equivalent in the world of conservation. At the time such studies did not exist in Switzerland, so I was shipped off to the London Institute of Archaeology at UCL. In those pre-Brexit times living in the UK was a great and life enhancing experience. Later I was snatched up by the National Museum of Switzerland, a university-trained conservator being a rare species back then. When asked to participate in the newly established conservation degree in La Chaux-de-Fonds (now HE-Arc in Neuchâtel), I figured it could not be worse than blasting iron corrosion all day. It turned out that I liked it, which probably explains why I still train conservators after more than 20 years. I always kept a foot in my independent workshop in Zurich that allows me to have a healthy balance between training and doing actual conservation. When I am not

looking at corrosion or working with students, I like to dabble in cultures that were happy metal-free societies before Europeans arrived at their shores and changed their lives forever. Metals changed mine too, for the better, who knows....

## Nicola Emmerson



I trained in archaeological conservation at Cardiff University where I was inspired by David Watkinson and his research and interest in all things metal. When a career in private practice was cut short by the global recession, I retrained as a high school chemistry teacher but was rescued from this by an offer to return to Cardiff to study a PhD in coatings for historic wrought iron structures. It has been my privilege to work extensively with metals conservation practitioners and their questions inspire my research which continues in my lectureship at Cardiff where I teach

undergraduate, postgraduate and doctoral conservators.

I was delighted take up an Assistant Coordinator role and support the triennial programme which culminates in the Metal conference, a calendar highlight for the metals conservation community.

## Elodie Guilminot



I completed my engineering diploma at Polytech Nantes in 1996 and obtained a PhD in electrochemistry at the Institut National Polytechnique de Grenoble in 2000. Since my studies, I have sought to associate science with the conservation of cultural heritage. My PhD thesis focused on the conservation of waterlogged wood/metal composites in collaboration with the French conservation-restoration laboratories Arc'Antique and ARC-Nucléart.

I joined the Arc'Antique laboratory in Nantes as conservation scientist in 2006 to conduct and coordinate research projects. My research

interests include the corrosion of metals and the development of restoration treatments. I am interested in the heaviest metals through study of curse tablets (lead tablets with engraved magic spells) as well as in the lightest metals by studying the conservation of aluminium alloys in WWII aircraft. Through these projects, but also through the organisation of national conferences and workshops, I wish to bring together scientists and conservators.

## Vandana Singh



Beginning as a scientist in natural science (MSc. in Chemistry), I have been in Conservation since 2008 and Head of the Metal Conservation laboratory at the City Palace Museum, Udaipur since 2018. I have embraced international opportunities whenever possible, including a fellowship at the Object Conservation Department, The Metropolitan Museum of Art, New York in 2017, where I worked on the use and basics of operating

different non-invasive imaging and analytical techniques in the conservation of metallic cultural heritage. My interdisciplinary research focuses on uniting traditional knowledge, conservation and natural sciences (chemistry and physics) and exploring the impressive material culture of a traditional metal craftsmen community of South Asia.

I also work in private practice (Kalasampadaa) and am the co-founder of a conservation and research centre CARE Centre for Art Conservation and Research Experts, LLP in New Delhi. In addition to the ICOM-CC Assistant Coordinator role, I am Joint Secretary and Executive body member of IASC (Indian Association for the study of Conservation of Cultural Property) in New Delhi.

## Ellen van Bork



As a teenager, I somehow got the idea that becoming a conservator was my calling. With a love for all things shiny, I decided that my focus would be on metals. At just 18 years old, I was still rather young to start conservation training and was advised to first become a gold- and silversmith in Schoonhoven, the Netherlands, a decision that has proven especially useful to this day. After one year of Museum Studies at the Reinwardt Academy, I was thrilled to discover that I was accepted to become a metals conservator at the Cultural Heritage Agency (RCE) in Amsterdam. After graduating in 2009, I worked for the British Museum, largely on archaeological objects. I subsequently started as a Junior Conservator at the Rijksmuseum in Amsterdam, coordinating the restoration of about 2500 metal-based objects going on display for the reopening of the museum in 2013. This project also included the conservation treatment of largely historical objects, such as the jewellery and silver collections. I also ran a metal

conservation studio (van Bork Metal Conservation), where I carried out conservation and consultancy projects for museums, art dealers, and art collectors. From 2011 to 2019, I was a lecturer and coordinator for the Master and Post Graduate conservation programme at the University of Amsterdam. I am currently a metal conservator at the Rijksmuseum and my main focus is (gilded and shiny!) silver objects, particularly their manufacturing techniques and the associated deterioration processes. I also run the Dutch Hallmarks Project, building a database of silver hallmarks coupled to an automated recognition system and online portal where users can upload and compare their own marks to those in associated collections.

## **ICOM-CC METALS WORKING GROUP TRIENNIAL PROGRAMME 2020-2023**

The Coordinator and Assistant Coordinators have taken inspiration from the conversations and presentations at Metal 2019 to arrive at the triennial themes for 2020-2023.

While the themes of this Triennial remain solidly anchored in the practice of conserving and studying metal artifacts, it is equally important to widen our scope and invite the overarching theme of sustainability into our forum. It is hoped that this effort will help our group explore new directions and engage in a more diverse and inclusive dialogue.

Our themes are:

### **Elevating the voice of the conservator – interpreting objects and the conservator’s role.**

- Growing discourse surrounding social justice and objects with contentious narratives; vandalism.
- Exploring the preservation and presentation of difficult objects.
- Teaching metals conservation – adapting the curriculum to evolving social and economic realities.
- Giving a voice to emerging conservation professionals and their vision for the future of the field.

### **“Going Green” – sustainability in practice in the metals conservation community.**

- Alternative treatments.
- Eco-friendly products.
- Innovative chemical recycling.
- Developing affordable mass treatment solutions.
- Preventive conservation, defining green policies adapted to the conservation of metals.

### **Cross-disciplinary collaborations – opportunities for innovation and cross-fertilization.**

- Working with conservators from other specialties, engineers, scientists, artists, volunteers and the general public.
- The value of traditional knowledge sharing and craftsmanship.
- Technology transfer from the industry.
- Defining a more holistic and inclusive approach to the conservation of composite objects.
- Technological, engineering, historic objects, public art. The pros and cons of preserving functionality, defining alternatives and refining best practices.

## PROJECT SHOWCASE

### Tears of the moon, corrosion and gelling agents: a MA student lab-project at the HE-Arc Conservation Restauration

Valentin Boissonnas and Laura Flückiger  
HE-Arc, Neuchatel, Switzerland

Every year MA students at the Haute-Ecole Arc have the opportunity to develop an individual project around metal artefacts as part of their curriculum. One object of interest in 2021 was a pre-Columbian funerary mask from Peru from the Museum of Art and History of La Neuveville. Despite a lack of information concerning its archaeological context the iconography closely associates it to the Lambayeque (Sicàn) culture (700-1350 AC).

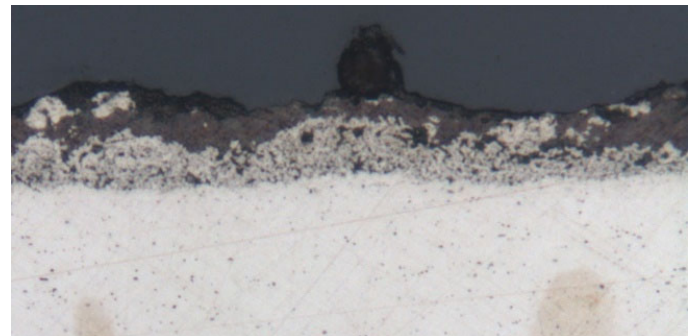


*The funerary mask before treatment (30.7 cm x 17.5 cm x 3.5 cm)*

This mask is assembled from thin metal sheets that were obtained by cold working. Even though the corrosion products made it look like a ternary tumbaga alloy, XRF analysis identified it as a rather pure silver alloy (97.2%

Ag and 2.8% Cu). Referred to as the tears of the moon, silver was highly valued by pre-Columbian Andean cultures. It was treasured for its brilliance, workability and mythical association with the female, in contrast to gold that was considered male and associated with the sun.

In order to better understand the composition of the alloy and its corrosion layers a small fragment was detached from an already damaged area, cold mounted and polished. The cross-section revealed a thick layer of silver chloride (AgCl) with spots of copper chlorides. The limit of the original surface was still well preserved in the metallic silver alloy.



*Top: the cross-section under bright field. Bottom: an interpreted stratigraphy: Probable but unidentified copper bromide (pink), silver chloride (black), green copper corrosion products, copper chlorides (light green) and sediments (brown).*



After an extended series of tests, the treatment protocol was defined as follows: gentle mechanical cleaning of soil residues, removal of copper corrosion products with trisodium EDTA (pH 7, 0.03M) and reduction of silver chlorides with 5% sodium dithionite (pH 12, diluted in a 4% sodium hydroxide solution). As the back of the mask was to be left untouched, the action of the chemical solutions had to be limited to the front side. To achieve this, perforations and border areas were covered with melted Cyclododecane as a temporary protective layer. EDTA was applied twice in a gel of Klucel E (20%) for a duration of one hour. In areas of joints a thicker gel of Agar was used to avoid seeping of the solution into the crevices.



*The two nose pendants are still in their original state, the surrounding mask has been cleaned with the EDTA in a Klucel gel and the nose is undergoing an EDTA/Agar facial.*

In order to reduce the silver chloride layers a 5% solution of sodium dithionite was used. Its high pH does not allow the use of most gelling agents, but a satisfactory result was achieved

with a 16% Laponite solution. After a 30 minute application, the gel showed brownish discoloration as reduced corrosion products had migrated into the lower gel layers. This gray-black paste could be removed with cotton swabs. Between five and seven applications were necessary to remove all silver corrosion products. The oxidation of the solution was minimized by covering the gel with a clingfilm. In the literature alkaline dithionite is attributed as having a consolidative reduction effect. In our case it appeared more like a dissolution of the black silver chloride layers.



*Top: The mask covered with a layer of sodium dithionite in Laponite that is turning brown after 30 minutes, indicating a reduction of the silver chloride. Bottom: Some darker areas remaining after EDTA and sodium dithionite treatment.*

After cleaning, the surface retained some grey discolored areas where thick layers of silver chlorides had been removed. These were removed with cotton swabs using a precipitated calcium carbonate/ethanol mixture. None of the original surface polishing marks were affected by this final treatment. The mask was thoroughly rinsed after each application of EDTA and sodium dithionite. It was returned to the museum in a custom-made packaging lined with layers of pollutant absorbent 'Pacific Silvercloth' that should prevent, or at least slow down, future tarnishing.



*The mask after the complete treatment that revealed not only a well-preserved original surface but also a multitude of tool and wear marks. The back side retains all its original corrosion layers for future studies.*

All relevant information on the object, its corrosion layers, and the analysis, will be accessible in the MiCorr database. This non-invasive diagnostic tool developed by the HE-Arc is freely accessible under <https://micorr.org/> and we would like to encourage professionals and students in conservation to submit their findings on other

metal objects having undergone close examination.

All photographs © HE-Arc, 2021, Laura Flückiger

## **REPORT OF A TRAINING PROGRAMME ON SCIENTIFIC EXAMINATION AND CONSERVATION OF COPPER BASED OBJECTS**

Karni Singh Jasol and Sunayana Rathore  
*Mehrangarh Museum Trust, Mehrangarh Fort,  
Jodhpur, Rajasthan, India*

A one-week in-house training program on the conservation of cupreous objects (copper and copper alloys) was conducted by The Mehrangarh Museum Trust, Jodhpur under the Tata Trusts - Art Conservation Initiative. The workshop was hosted by the Mehrangarh Art Conservation Centre, Mehrangarh Fort, Jodhpur from February 8–13 2021.

Mehrangarh Museum Trust (MMT) was established in 1972 by the 36th custodian of Marwar-Jodhpur, His Highness Maharaja Gaj Singh II. The trust is at the forefront of conservation-restoration, a generous patron of the arts, and a lively centre of academic study. The Mehrangarh Fort and the museum are a center for excellence in the field of cultural heritage, the museum collection nurtures the artistic and historic endeavors of Marwar - Jodhpur, Rajasthan. MMT has collaborated

with the Tata Trusts Project - Art Conservation Initiative as a regional institute with a vision to initiate and develop the conservation movement across the region. The objective of this project is to expand and strengthen the Mehrangarh Art Conservation Centre, and to create a cohort of trained art conservators over the period of four years.

An in-house training course was held for the best practice in conservation of copper-based objects at the Mehrangarh Art Conservation Centre, Jodhpur. The museum houses a wide range of copper and copper alloy objects. The full training session was instructed by Dr. Vandana Singh, metal and scientific expert in the field of metallic cultural heritage and Director of the Centre for Art Conservation and Research Experts, New Delhi. The training was intensive and detail-oriented, the participants were taught photo-documentation, condition assessment, conservation reporting, and customized cleaning techniques for their objects. The objects for conservation were part of the museum collection, and the range varied from household utensils, animal decoration jewellery and the decorative arts.

A special interest within the program is the scientific examination using a hand-held X-ray fluorescence spectroscopy, which was highly important in the preparation of a proposed treatment plan. The XRF analysis provided information on the elemental characterization



*Attendees identifying factors affecting deterioration of metals*

and alloy concentrations (semi-quantitative) which further enhanced the documentation process. The participants identified areas of soldering, welding and inscriptions, since they could be damaged under uncontrolled cleaning conditions. Thus, complexities of metal conservation were broken down into simplified techniques which truly helped the conservators assess their performance on the metal objects.



*Microscopic analysis of an artefact*

The training program ended with the evaluation of the treatment and conservation process. The participants were encouraged to make decisions regarding the examination, scientific

analysis, documentation and conservation of copper-based objects and also simultaneously gained confidence to prepare a plan of action for the remaining objects. Not only conservators, but art historians and private stakeholders also participated in the theoretical sessions and discussions to gain comprehensive knowledge of material identification and storage of the copper-based objects in the collection.



*The XRF technician shows how the measurements are made using the HH-XRF instrument, Hand-held XRF Analysis*

This training course helped in capacity building for the experienced in-house conservators and young conservation professionals. Such partnerships are an example of best practice in a collaborative exercise with allied vision - that of Tata Trusts Art Conservation Initiative and its regional partner MMT.

## **FELLOWSHIP OPPORTUNITIES AT THE RIJKSMUSEUM**

The Rijksmuseum Fellowship Programme strengthens the bonds between museums and universities and encourages exchange of

knowledge. We offer highly talented candidates the opportunity to base part of their research at the Rijksmuseum, with access to the museum's expertise, collections, library and laboratories, workshops and excursions.

Of particular interest may be the Migelien Gerritzen Fellowship for conservation and scientific research. This fellowship enables candidates to collaborate with conservators, curators and scientists active at the Rijksmuseum. Research proposals should focus on the Rijksmuseum collection or ideation that has been initiated at the Rijksmuseum. A suitable project might entail technical research into objects in the Rijksmuseum's collection or analytical techniques, preventive conservation, or treatment methodologies.

The deadline for applications is 10 January 2022. The newly selected fellows will start in September 2022.

You can find all further details and eligibility requirements here:

[www.rijksmuseum.nl/en/fellowships](http://www.rijksmuseum.nl/en/fellowships)

[www.rijksmuseum.nl/en/migelien-gerritzen-fellowship](http://www.rijksmuseum.nl/en/migelien-gerritzen-fellowship)

Contact: Barbara Tedder

Coordinator Academic Programs

[Fellowships@rijksmuseum.nl](mailto:Fellowships@rijksmuseum.nl)

## UPCOMING CONFERENCES



**inArt 2022**

5th International Conference on Innovation in  
Art Research and Technology

Paris, France

28 June – 1 July 2022

Deadline for Abstracts: 10 January 2022

Themes include:

Comprehension of materials and techniques  
involved in Cultural Heritage

Degradation mechanisms and conservation  
strategies

Technological developments and data analysis

<https://inart2022.sciencesconf.org/>



**EuroCorr 2022**

Berlin, Germany

28 August – 1 September 2022

Join the session of Working Party 21 Corrosion  
of Archaeological and Historical Artefacts

Deadline for Abstracts: 14 January 2022

<https://dechema.de/EUROCORR2022.html>



**Metal 2022**

10th Interim Meeting of the ICOM-CC Metals  
Working Group

Helsinki, Finland and virtual

5 – 9 September 2022

Join us in Finland – or virtually - for the next  
Interim Meeting of the Metals Working Group  
at the spectacular Suomenlinna Fortress, a  
UNESCO World Heritage Site located at the  
entrance to Helsinki's harbour.

Following an enthusiastic response to the call  
for papers and posters, we look forward to a  
packed program and another wonderful Metals  
meeting.

[www.metal2022.org/](http://www.metal2022.org/)



# ICOM-CC

## Valencia 2023

20<sup>th</sup> ICOM-CC Triennial Conference

Valencia, Spain

18 – 22 September 2023

Call for Papers – to be announced

[www.icom-cc.org/en/conferences/triennial-conferences/20th-icom-cc-triennial-conference-in-valencia-spain](http://www.icom-cc.org/en/conferences/triennial-conferences/20th-icom-cc-triennial-conference-in-valencia-spain)



**Big Stuff 2022**

Conservation and safeguarding of industrial and technological heritage.

Seixal, Portugal and virtual

28 – 29 September 2022

Deadline for Abstracts: 5 February 2022

<https://sites.google.com/fct.unl.pt/big-stuff-2022>

## HOW TO JOIN ICOM-CC

Joining ICOM, ICOM-CC and membership in the Metals Working Group is an easy 3 step process.

1. Start by joining ICOM in your country of residence.

2. Select the Committee for Conservation as your preferred International Committee. This is part of the membership form and you can only select one International Committee as your official committee.
3. Once you receive your membership card and membership year sticker from your ICOM National Committee, set up an online account at <http://www.icom-cc.org/> and then choose the Metals Working Group as one of your Working Groups by clicking the 'Join this Working Group' button on the ICOM-CC website. You can choose as many Working Groups as you want to participate in. Note that you are not officially a Metals Working Group member until your online account is set up and you click 'Join this Working Group'.

Some of the great benefits of joining are:

- Build a strong international professional network
- The ICOM card which grants free (or sometimes reduced rate) entry to many museums around the world.
- Reduced registration fees at ICOM-CC Triennial conferences and the Metals Working Group Interim Meetings.
- Priority consideration for paper/poster acceptance at the ICOM-CC Triennial

Conferences and the Metals Interim Meetings.

- The possibility to join any working groups you like and receive regular updates, news and information.
- Advocate for conservation

## **ICOM-CC FUND**

Please consider making a donation to the Stichting ICOM-CC Fund. Financial support is urgently needed to promote the conservation and care of cultural heritage worldwide and support and expand the exceptional work of ICOM-CC and its 21 Working Groups.

For more information:

[www.icom-cc.org/en/icom-cc-fund](http://www.icom-cc.org/en/icom-cc-fund)

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