Conservation Science Education Online: Inaugural Conference

Final Program

June 14 – 16, 2022

KRESS

BUFFALO STATE
The State University of New York

Queen's University

Introduction

Welcome to the inaugural conference of *Conservation Science Education Online*. We are pleased that you are able to attend and be part of this exciting and interactive conference. *Conservation Science Education Online (CSEO)* is a resource that highlights the use of "threshold concepts", an educational approach currently attracting international pedagogical interest in various fields. Threshold concepts identify and elucidate key concepts in a specific subject that are challenging for teachers to explain or students to learn.

This virtual conference is designed to allow international educators in the field of Heritage Science to showcase innovative teaching strategies, case studies and laboratory exercises that they have found to be successful in their teaching, breaking boundaries in making science more relevant to students.

Invited speakers and poster presenters come from various international locations, offering a global perspective on the difficulties involved in teaching heritage science to a broad range of students.

All presentations and posters will be front-loaded online to permit them to be viewed in advance to allow for more dialogue during the conference. Questions can be placed in the comment section on the YouTube video and asked during the conference via the Q&A tab. Links to the talks will be made available to the participants a week prior the conference.

We will be recording the conference. We may be using quotations for research in the future, but we would contact you for consent beforehand.

Thank you all for attending and participating in this important initiative.

The Conference Organizers,

Alison Murray, Rebecca Ploeger, Aaron Shugar and Kyna Biggs

Conference Outline

(all times are listed in ET – Toronto/New York time)

Day 1 (June 14)

- 8:15-8:30 – Opening Remarks: Welcome & Introduction to CSEO
- 8:30-10:30 – Discussion Session 1 of Invited Panelists: *Overarching Theme: Learning Scientific Language through Examples with Meaning*
- 10:30-10:50 – Pause for Refreshments
- 10:50-13:00 –Discussion Session 1 of Poster Presenters: *Overarching Theme: Finding Relatable Examples - Threshold Concepts, Teaching Methods, Research and Teaching to Non-Conservators*

Day 2 (June 15)

- 8:30-8:35 – Opening Remarks: Welcome
- 8:35-10:35 – Discussion Session 2 of Invited Panelists: *Overarching Theme: Theory to Practice - Engagement through Training*
- 10:35-11:35 – Pause for Refreshments and Breakout Sessions

Day 3 (June 16)

- 8:30-8:35 – Opening Remarks: Welcome
- 8:35-10:35 – Discussion Session 2 of Poster Presenters: *Overarching Theme: Shifts in Teaching and Self-Reflection - Social-Media, Pandemic, E-Learning and Teaching Strategies*
- 10:35-10:55 – Pause for Refreshments
- 10:55-11:45 – Comments from Moderators and Closing Remarks

Detailed Preliminary Program: Including Presenters, Titles, and Abstracts for the Invited Speakers

June 14th

Opening Remarks (8:15-8:30)

Welcome & Introduction to CSEO and the Conference

Discussion Session 1 of Invited Panelists (8:30-10:30): Moderated by ***Laura Fuster López****, Professor, Department of Conservation and Restoration of Cultural Heritage, Universitat Politècnica de València, Spain*

Overarching Theme: *Learning Scientific Language through Examples with Meaning*

Abstracts and Biographies of Panelists

Teaching Fundamental Concepts to Understand and Predict the Microclimate in Packages, Showcases, Microclimate Vitrines and Backing Board Protected Paintings

Giovanna Di Pietro*, Department of Conservation of Works of Art, Bern University of the Arts, Bern, Switzerland*

Abstract
While meteorology describes the climate in large open spaces like the atmosphere, conservators deal most of the times with closed or semi-closed spaces like transport boxes, show-cases or backing board protected paintings. The proposed teaching unit looks at how fundamental microclimate concepts can be taught to enable students to predict relative humidity changes in closed and semi-closed systems under external relative humidity and temperature changes. At the end of this unit students are expected to be able to apply these concepts to challenges in the conservation-restoration practice. Examples of these challenges are estimating under which conditions packing a pest-infested object with impermeable film increases the risk of mold growth on the object, predicting the factors that govern the relative humidity within a transport

box, and at an advanced stage, be able to suggest the best backing board material for a painting depending on the surrounding environmental conditions.

The lesson builds on the fundamental concepts of relative humidity of a volume and of equilibrium moisture content of hygroscopic materials. Both concepts are presented as dynamic equilibrium states in closed systems. The most commonly observed misconceptions are addressed. These concern the difficulty of estimating the order of magnitude of the quantities involved: how much water vapor can be found in the volume of a box at a certain relative humidity? And how does this quantity relate to the moisture found within the hygroscopic materials present in the same box? The notion that in a closed system the equilibrium moisture content of the hygroscopic materials determines the relative humidity is central and it is used to analyze climatic data in packages, microclimate vitrines and show-cases subjected to constant and varying temperature. Later semi-closed spaces like permeable packages, leaking boxes or backing board protected paintings are considered. Central is the concept of comparing fluxes to predict the resulting relative humidity and why hygroscopic materials are said to buffer relative humidity changes. For advanced students the challenging case of backing-board paintings subjected to relative humidity gradients is presented together with possibilities to model it with the aim of identifying the physical characteristics of the best backing board material.

This unit is the result of more than 10 years of experience of teaching courses developed in collaboration with my colleagues conservators-restorers. The scientific method (observation-hypothesis-test experiment) is used throughout the unit. A number of simple experiments are proposed both with model systems (plastic bottles) and on systems close to the reality of conservators-restorers.

Dr. Giovanna Di Pietro is professor of Physics at the Department of Conservation and Restoration of the Academy of the Arts in Bern, Switzerland. After her master in Physics at the University of Milano, Italy, she worked at the Centraal Laboratorium in Amsterdam on microclimate in back protected paintings and then earned a PhD from the University of Basel with a thesis on the degradation of silver gelatin glass plates. In the last ten years beside her research activity she has been responsible for the curriculum development of her department and involved in developing a didactics of physics for conservators-restorers

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How to Overcome Conservation Students' Resistance to/Fear of Science by the Way the Syllabus is Taught from the Start.

***Maggi Loubser**, Tangible Heritage Conservation, School of the Arts, University of Pretoria. South Africa*

Abstract

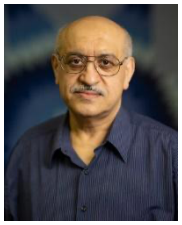
Our programme is only at the start of its fourth year, and every year I have systematically tried to address what emerged as Threshold Concepts, but even so, when I asked the 2021 group what their biggest stumbling block was, apart from the expected "redox reactions" and "reaction equations", I still got "Science". When I told the students they had to be more specific, the answer I got was: "When there is math with the Science". At this point I need to explain that our delegates come from various undergraduate backgrounds, Fine Arts, Visual Studies, Archaeology, Historical and Heritage Studies, Museum Studies and even Tourism, and these are the students who mostly left science behind in their 9th schoolyear and focussed on the humanities.

I realised from the start that teaching these students the necessary science principles they need to understand the materiality of conservation would be a challenge, and I have always attempted to conclude every topic by bringing it back to the conservation principles they would need. I also ensured that their assessment assignments were not necessarily testing their chemistry but served as a tool for them to investigate the links between the chemistry they learned and the associated conservation practices.

This year I want to take my approach a step further and see if I cannot overcome the "Science is the scariest part of the science module". I am going to use the hybrid teaching approach we were forced to develop over the past two years and give the students pre-study work in the form of a specific case study using an article, a recording or video. I'm going to explain that it is not necessary to understand everything – it is OK if the science is unfamiliar. Then we will do the theory, and afterwards I plan to return to the original case study and ensure that the class can make the necessary links.

In this paper, I will report on how this worked, using the very first introductory lectures as an example: Matter and Materials, Atoms, Molecules and Ions and the Periodic Table.

In a career as analytical chemist spanning three decades in the Mining and Manufacturing Industry, Maggi Loubser worked in government, academia, as well as industry and ran her own consulting company. At the beginning of 2019 she was appointed by University of Pretoria to run the new Masters Programme in Tangible Heritage Conservation, so currently she is teaching science to students with a humanities background to equip them to better understand the materials they work with in conservation and research of cultural heritage objects.




Use of Indigenous Elements in Teaching Mathematics and Science

Arzu Sardarli and Jana Sasakamoose*, First Nations University of Canada, Regina, Saskatchewan, Canada*

Abstract

It is remarkable that the word "Science" that we educators use as a title for the group of subjects (Physics, Biology, Chemistry, etc.) taught in academia, is translated into many languages (Arabian, Ukrainian, Turkish ...) as "Knowledge", giving the meaning of gaining and analysis of integrated information about both Nature and Community. This is not just a linguistic nuance. I try to bring elements of the Indigenous Knowledge and Art to the teaching of my post-secondary Mathematics and Science courses in order to add this missing piece to the puzzle, combining the so-called “Western” and Indigenous knowledge. My view of this integration is very close to the “Etuaptmumk” - Two-Eyed Seeing principle explained by Elder Albert Marshall, which refers to "learning to see from one eye with the strengths of Indigenous knowledge and ways of knowing, and from the other eye with the strengths of Western knowledge and ways of knowing ... and learning to use both these eyes together, for the benefit of all" [1].

Some teaching materials with Indigenous content have been collected during my community-based research projects in First Nations communities in Canada [2 – 5] and another significant part was obtained from the interviews made with Indigenous Elders and Knowledge Keepers. Modern technologies allow us to incorporate the original interviews into the teaching materials in various media formats. I also used the elements of Indigenous Art in the “Cree Dictionary of Mathematical Terms with Visual Examples”, co-authored by me and Indigenous educator Ida Swan.

Within my projects supported by the First Nations University of Canada and the University of Regina, I have created examples with Indigenous content for introductory Physics, Calculus and Statistics courses. My graduate student Jana Sasakamoose helped me with developing examples for my Statistics course. Some of the examples with Indigenous content will be published in the introductory Physics and Statistics textbooks that I co-author with my colleagues from the University of Regina.

[1] “Two-Eyed Seeing”, Mi'kmaw Elder Albert Marshall, retrieved from: http://www.integrativescience.ca/Principles/TwoEyedSeeing/
[2] A. Sardarli, Use of Indigenous Knowledge in Modeling the Water Quality Dynamics in Peepeekisis and Kahkewistahaw First Nations Communities, *Pimatiswin: A Journal of Aboriginal and Indigenous Community Health 11*(1), 2013, 55-63
[3] A. Sardarli, S. Pete, T. Ngamkham, S. Suraphee, A. Volodin, The Determinants of Annual Income in Aboriginal and Non-Aboriginal Communities: Comparative Statistical Analysis, *Thailand Statistician, 17*(2), 2019, 235-241

[4] A. Sardarli, “Studies of Physical Parameters of Indigenous Artifacts. Collecting and preserving the relating oral stories”, 160 p, Print ISBN-13: 978-0-7731-0767-0, Online ISBN-13: 978-0-7731-0769-4, University of Regina, 2021 http://indigenous-artifacts.ca/brochure/
[5] A. Sardarli, A. Volodin, Kh. Osmanli, E. Siegfried, Statistical Analysis of Physical Parameters of Indigenous Artifacts, *Lobachevskii Journal of Mathematics,43* (2), 2022

Dr. Sardarli joined the First Nations University of Canada in 2007. He led a number of community-based projects. Dr. Sardarli uses Indigenous elements in his teaching. He co-authored the first Cree Dictionary of Mathematical with elements of Indigenous Art. In 2008, Dr. Sardarli initiated a nationwide annual Wiseman Mathematics Contest. He coordinated the research project on mathematical modelling of water quality using Indigenous knowledge. Dr. Sardarli’s projects have been supported by agencies, such as NSERC, SSHRC, Health Canada, and Canadian Heritage. He received The Recognition Event Awards of The Regional Centre of Expertise (Saskatchewan) for his innovative Indigenous community-based projects.

Considerations Regarding the Teaching of Reflectance Imaging Spectroscopy

Erich Uffelman, *Department of Chemistry and Biochemistry, Washington and Lee University, Lexington, Virginia, USA*

Abstract

Reflectance Imaging Spectroscopy is a powerful tool in cultural heritage science because it noninvasively provides large scale maps containing chemical information, large scale images of layered compositional information, or both. This talk will briefly provide useful examples in the visible to near-infrared (VNIR) and short-wave infrared (SWIR) of underdetermined multispectral data sets and overdetermined hyperspectral data sets and indicate the types of questions that can be answered from such data. The talk will also provide an overview of how these techniques can be introduced to novices seeking a greater understanding of these methodologies.

Dr. Erich Uffelman received his PhD as an NSF Predoctoral Fellow from the California Institute of Technology in 1991 and completed an NIH Postdoctoral Fellowship at Stanford University in 1993. In 1993, he joined the faculty of Washington and Lee University. In 2009, he was one of twelve faculty in the Commonwealth of Virginia to win the State Council of Higher Education of Virginia’s Outstanding Faculty Award. He is currently the Robert O. and Elizabeth M. Bentley Professor of Chemistry. He has collaborated with numerous museums and academic institutions in the US and Europe.

PAUSE FOR REFRESHMENTS (10:30-10:50)

Discussion Session 1 of Poster Presenters (10:50 – 13:00): Moderated by ***Edgar Casanova-González****, CONACyT Researcher, National Laboratory of Sciences for the Research and Conservation of Cultural Heritage, Universidad Nacional Autónoma de México, Mexico*

Overarching Theme: *Finding Relatable Examples - Threshold Concepts, Teaching Methods, Research and Teaching to Non-Conservators*

Discussion group 1

Megan Creamer and Emy Kim - Complex Systems & Constructive Failures: Experimental Workshops with Dyes and Electrochemical Cleaning **CANADA**

Kirsten Moffitt - Mastering the Microscope: Approaches in Polarizing Light Microscopy Instruction **USA**

George Wheeler - It's a Material World: Bringing Material Science and Mechanical Engineering to a Laboratory Exercise **USA**

Discussion group 2

Pilar Bosch-Roig, Lucía Bosch-Roig, Melani Lleonart-García, and José A. Madrid-García *Instagram to Promote Motivation and Learning Environments in Higher Education: A Preliminary Study.* **SPAIN**

Yerko Quitral - On-site Assessment of the Status of Historical Libraries as Part of the Conservation Training Process **CHILE**

Sagita Mirjam Sunara- From Tomatoes to Chocolates: Teaching Conservation Students How to Take a Representative Sample **CROATIA**

Discussion group 3

Maria Kokkori, Francesca Casadio and Ken Sutherland - Bringing Materials into Focus: Teaching Initiatives at the University of Chicago and the Art Institute of Chicago **USA**

Catherine Matsen, Jocelyn Alcántara García and Rosie Grayburn - The Expansion of Conservation Science Student Research Projects **USA**

Corina Rogge - Is the Message in the Media? Object-based Learning and Brazilian Constructive Art **USA**

June 15th

Opening Remarks (8:30-8:35)

Session 2 (8:35-10:35): Moderated by ***Gregory Dale Smith,*** *The Otto N. Frenzel III Senior Conservation Scientist, Indianapolis Museum of Art at Newfields, USA.*

Overarching Theme: *Theory to Practice: Engagement through Training*

Abstracts and Biographies of Panelists


A Collaborative Project-Based Approach for Teaching Instrumental Analysis in a Cultural Heritage Context

Patricia Gonzales and Betty Galarreta*, Department of Science, Chemistry Section, Pontificia Universidad Católica del Perú, Lima, Peru*

Abstract

The Chemistry Section at the Pontificia Universidad Catolica del Peru offers a variety of mandatory and elective courses that are open to a broader audience, both as part of our regular curricula and, recently, as open courses. The applications of chemistry in art and archaeology constitute an excellent opportunity to promote active learning in an interdisciplinary context, and it is an attractive topic for non-Chemistry majors. With this idea in mind, we designed a course focused on the interdisciplinary analysis of cultural heritage objects, with emphasis on their chemical components and on the techniques used for their study.

In order to make it easier for our students to understand instrumental analysis in this context, we designed a mini research project activity. The students, organized in groups, would select an object that was of interest to them, propose a question and try to solve it using techniques available to us in the laboratory (XRF, Raman, FORS, FTIR, XRD). The COVID-19 pandemic presented a serious challenge to our course design, as we were not allowed to hold in-person activities; however, we decided to keep as much as possible from our original design of this activity. To this end, we selected papers that had very detailed instrumental analysis information on several and very diverse objects. We gave the students an overview of the problem that needed to be solved in each case and they chose the topic/object that they were most interested in. Once they had selected their project, data was provided to each group gradually, over the course of three class sessions, and in response to the sequence of analyses they would propose in the object of their study. We asked them to refrain from actively looking for the paper/papers where the information had come from, which they did honor. Each week they had to present their

findings to their classmates, professors and guest specialists, and justify the need for their next analysis step. At the end of the term, we had an oral presentation, open to the public, with the results of their investigations.

Working in this manner, students got a better idea of the questions that can be answered through chemistry and instrumental analysis and of the limitations one can encounter both due to the techniques and the objects. Additionally, even though we had originally planned to use techniques that were accessible to us on campus, the approach forced on us by the COVID-19 pandemic ended up working very well and it can be used in cases in which there is limited accessibility to instrumentation.

Dr. Patricia E. Gonzales is a chemistry professor and a member of the Cultural Heritage Material Analysis Research Group (GAMPAC) at the Pontificia Universidad Católica del Perú. She obtained her Ph.D. In Biochemistry and Molecular Biophysics from the University of Pennsylvania, Philadelphia, USA. Her current research is focused on the chemical analysis of archaeological objects and works of art, by means of techniques such as XRF, Raman, FTIR, among others.

Dr. Betty C. Galarreta is a professor of analytical chemistry, and member of the Cultural Heritage Material Analysis Research Group (aka. GAMPAC) at Pontificia Universidad Católica del Perú. She obtained her Ph.D. at the University of Western Ontario, Canada. Her current research interest focus on the development of nanosensors and spectroscopic protocols that could be applied to food analysis and cultural heritage materials, in particular those related to the use of Raman, FTIR, and UV-vis spectroscopy.

Teaching Solubility to Conservators: From Salt Solutions to Dissolving Varnish

***Austin Nevin**, Department of Conservation, Courtauld Institute of Art, London, United Kingdom*

Abstract

This talk will focus on the threshold concept of solubility, an area that is challenging both for teachers and students. Solubility is a concept that is essential for the understanding of conservation issues related to the behavior of inorganic salts in water as found in wall painting and stone conservation, and the cleaning of organic varnishes in easel painting conservation. The

integration of science and conservation teaching, and the gradual increase in the level of learning from basic knowledge of chemistry to more advanced critical assessments of scientific data have been identified as key challenges in teaching science for conservation students. It is useful here to see science teaching in conservation within a larger perspective that includes studies of teaching in chemistry where challenges relate to understanding macroscopic, sub-microscopic, and symbolic levels. The concept of solubility is a particularly tricky subject in chemistry with specific limitations associated with heuristics in teaching, with student misconceptions regarding the nature of saturation of solutions and intermolecular forces. Strategies for improving student learning about potentially quite abstract concepts like solubility can be improved principally through more direct engagement with students' conceptions and misconceptions, and the use of experiments and observation of chemical reactions to help students address specific concepts in solubility. Condensed teaching in lectures and short laboratory are insufficient for deep learning; instead sufficient time to learn and apply knowledge in extensive laboratories play a fundamental role in understanding of chemistry by undergraduates, and the consolidation of knowledge for conservators in practical work at The Courtauld.

Dr. Austin Nevin, chemist and conservator is the Head of the Department of Conservation at the Courtauld Institute of Art. His research focuses on the analysis of paintings and painting materials, and the study of ancient and modern cultural heritage using optical and spectroscopic techniques. He is a Vice President and Fellow of the International Institute for the Conservation of Artistic and Historical Works of Art.

Parallel Training Programs - A Network Approach

Anupam Sah*, Head of Art Conservation, Research, and Training, CSMVS Museum Art Conservation Centre, Mumbai, India*

Abstract

Heritage Conservation is gradually becoming a household word in India and resources are being allocated to it and to its related sectors faster than the seasoning of trained heritage conservation practitioners implementing technically and ethically consistent work. The pool of conservation trainees comprises aspirants from backgrounds such as the sciences, fine arts, humanities, vocational studies and architecture. To add to the efforts by the existing training delivery platforms in India, a series of ten 4-month long intensive training courses in as many materials has been launched across five strategically located institutions in India. With the realization that just practicing art conservators are not enough, there is need for the engagement of administrators, art historians, museologists, architects and scientists to bring any holistic heritage conservation-restoration effort to fruition. Another program that brings all of them together is also underway with the purpose of creating a temper of technical art history and heritage

conservation science. This presentation discusses a part of the hybrid methodology that guides the participants to approach the technical study of the art objects by employing their respective strengths and acquired competence and collaborating with each other to build up enough information to be able to engage in fruitful conversation with each other. A soon-to-be-launched Master's program in Art Conservation in India aims to incorporate all these learnings into its curriculum.

Anupam Sah (B.Sc., M.A. Art Conservation) is an art conservation-restoration practitioner, strategist, and educator, trained in India, Italy and United Kingdom, over the past three decades he has worked across the length and breadth of the Indian subcontinent, and employs a Systems Approach to address heritage conservation issues and also link them with multi-sectoral development. With a commitment to strengthening the profession, he has helped develop art conservation facilities and training programs for various government, educational, and cultural institutions, and presently provides expertise as the head of art conservation, research, and training, at Chhatrapati Shivaji Maharaj Vastu Sangrahalaya Museum, Mumbai.

The Identification of the Binding Agent used in Turquoise-inlayed Bronze Objects in Ancient China

Shuya Wei, *Institute of Cultural Heritage and History of Science & Technology, University of Science and Technology Beijing, China*

Abstract

Several turquoise-inlay bronze artifacts were excavated by the archaeologists in Henan Province of China, which dates back to late Shang Dynasty and Zhou Period (1600-1046BC). In order to know the techniques and materials used to inlay the turquoise on the bronze artifacts, analytic techniques of pyrolysis gas chromatography/mass spectrometry with thermal assisted hydrolysis and methylation (THM-Py-GC/MS) were applied. Marker compounds of Chinese lacquer including methylated pentadecyl catechol and the oxidation products: 6-(2,3- dihydroxyphenyl) hexanoic acid; 7-(2,3-dihydroxyphenyl) heptanoic acid and 8-(2,3-dihydroxyphenyl) octanoic acid as their methylated forms were found in the bow-shaped bronze object, indicating lacquer was used as binding agents for the inlay. While, based on the detection of marker compounds of Mastic resin: 3-oxo-olean-18-en-28-oic acid, 3-oxo-olean-12-en-28-oic acid and ursa-2, 12-dien-28-oic acid in the sample taken from the bronze pot, it could be deduced that Mastic resin is the binding agent to inlay turquoise on the bronze pot. Interestingly, Beeswax was determined as the binding agent used on turquoise-inlayed bronze sword according to the detection of a series of alkanes, long chain fatty acids and long chain alcohols. The results clearly demonstrate that different binding agents were used to inlay turquoise onto artifacts respectively during Shang

Dynasty and Eastern Zhou Period in China, the technique of Py-GC/MS is suitable for the characterization of organic binding media materials.

Dr. Shuya Wei, professor in *University of Science and Technology Beijing,* her research mainly focuses on organic materials used in cultural heritage, supervising Master/PhD Students in the field of Cultural Heritage Science. She obtained her doctorate degree in the *Institute for Chemical Technologies and Analytics, Vienna University of Technology* in 2007. During 2007-2013, as a scientist she worked in the *Institute of Natural Sciences in Arts, Academy of fine arts Vienna*. From 1999-2002 she *studied in University College of London, U.K*. and gained two master degrees: M.Sc. in Principles in Conservation as well as M.Sc. in Conservation for Archaeology and Museums.

PAUSE FOR REFRESHMENTS AND BREAKOUT SESSIONS (10:35-11:35)

Time to breakout into smaller groups to have more detailed discussions.

June 16h

Opening Remarks (8:30-8:35)

Discussion Session 2 of Poster Presenters (8:35-10:35): Moderated by **Maartje Stols-Witlox**, Programme director and associate professor, Conservation and Restoration of Cultural Heritage, University of Amsterdam (UvA), the Netherlands

Overarching Theme: *Shifts in Teaching and Self-Reflection - Social-Media, Pandemic, E-Learning, and Teaching Strategies*

Discussion group 1

Ester S. B. Ferreira - Flipped Learning: Strategies towards Improving Learning Outcomes in Applied Sciences in Conservation and Restoration of the Bachelor Degree at the Cologne Institute for Conservation Sciences **GERMANY**

Elizabeth Peacock and Gordon Turner-Walker - *Organic Chemistry for Chemistry-Shy Emerging Conservators* **NORWAY**

Nora Ariadna Pérez-Castellanos and Yareli Jáidar-Benavides- *Coloring Science at UNAM, Mexico.* **MEXICO**

Abbie Vandivere and Annelies van Loon - *The Pigment Reference Set: A Resource for Technical Art History and Scientific Analysis* **NETHERLANDS**

Discussion group 2

Daniele Baltz da Fonseca and André Alexandre Gasperi - *Introductory Aspects to Discuss Transdisciplinarity in the Training of Conservators-Restorers* **BRAZIL**

Susana França de Sá and Márcia Vilarigues - Integrating Expertise for Teaching Collaborations in Conservation Science **PORTUGAL**

Dominique Scalarone - *The CAPuS E-Learning Platform for the Conservation of Art in Public Spaces* **ITALY**

Johanna Maria Theile Bruhns, *Conservation Science Education Online in Difficult Moments* **CHILE**

PAUSE FOR REFRESHMENTS (10:35-10:55)

Comments from Moderators and Closing Remarks (10:55-11:45): Moderated by Organizing Committee

Moderators and Conference Organizers

Moderators

Edgar Casanova-González, CONACyT Researcher, National Laboratory of Sciences for the Research and Conservation of Cultural Heritage, Universidad Nacional Autónoma de México, **Mexico**.

With a background in Radiochemistry (ISCTN, Cuba) and a Ph.D. in Materials Science and Engineering from the (UNAM, Mexico), Dr. Edgar Casanova-González is currently a CONACyT Researcher at the National Laboratory of Sciences for the Research and Conservation of Cultural Heritage, at the Physics Institute of the UNAM. Over the last decade his research has been dedicated to the development and application of non-destructive and portable analytical techniques for the study of cultural heritage. Such techniques include Raman, SERS, FTIR, XRF and FORS spectroscopies, together with imaging methods, applied to the analysis of a wide variety of materials.

Laura Fuster López, Professor, Department of Conservation and Restoration of Cultural Heritage, Universitat Politècnica de València, **Spain**

Dr. Laura Fuster-López is a Professor at the Conservation Department in the Universitat Politècnica de València (UPV), Spain. Apart from her research on the study of paintings' behavior and degradation published in peer reviewed journals, books, conferences and symposia, she has supervised many BA, MA and PhD projects and research internships. She is particularly interested in education, lifelong learning and dissemination, having served as assistant coordinator of ICOM-CC Education & Training Working Group (2011-2021). She is currently Vice-chair of the European Network for Conservation Restoration Education (ENCoRE), where she has been actively involved since 2010. Finally, she is founding member AcCESS- Academic Conservation Education Sharing Site.

Gregory Dale Smith, The Otto N. Frenzel III Senior Conservation Scientist, Indianapolis Museum of Art at Newfields, **USA**.

Dr. Greg Smith designed, outfitted, and now operates the conservation science laboratory at the Indianapolis Museum of Art at Newfields where he conducts technical studies of the museum's collections. His research interests include undergraduate education at the Arts-Science interface, assessing pollution off-gassing of museum construction materials, and understanding the chemical degradation of artists' materials. Dr. Smith was selected by the American Institute for Conservation (AIC) to receive their National Advocacy Award in 2018 for his work in public lecturing and curating exhibitions that focus on the role of Science in the Arts.

Maartje Stols-Witlox, Programme director and associate professor, Conservation and Restoration of Cultural Heritage, University of Amsterdam (UvA), **the Netherlands**.

Dr. Maartje Stols-Witlox currently heads UvA's programme of conservation and restoration, which offers nine different tracks in conservation and a track in technical art history. She has a background in art history and was educated as paintings conservator at SRAL in Maastricht. Maartje's research interests include reconstruction methodologies within the context of conservation/art technological investigations, conservation methodologies and green conservation. She is one of the founding members of the AcCESS platform (Academic Conservation Education Sharing Site) and is active (inter)nationally in a several committees focused on conservation education and research.

Conference Organizers

Alison Murray, Associate Professor of Conservation Science, Department of Art History & Art Conservation, Queen's University, **Canada**

Alison Murray is an Associate Professor in the Art Conservation Program, at Queen's University in Kingston, Canada. She received her Ph.D. degrees in Materials Science and Engineering from Johns Hopkins University in Baltimore, specializing in Conservation Science, offered through a joint program with the Smithsonian Institution. Her research has integrated information from mechanical testing data, chemical analysis, and surface analysis, with the goal of quantifying changes brought about by the cleaning process, ageing, and environmental conditions. Another area of research is improving the teaching of science to art conservation students. She is a Fellow of the International Institute for Conservation.

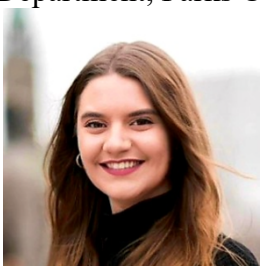
Rebecca Ploeger, Associate Professor of Conservation Science (organic materials) Art Conservation Department State University of New York, Buffalo State, **USA**

Dr. Rebecca Ploeger is an Associate Professor of Conservation Science in the Garman Art Conservation Department at Buffalo State College. She received her Ph.D. in Chemical Sciences from the University of Torino, Italy. Her main research interests are in the design, characterization and stability of synthetic polymeric materials use by artists and conservators.

Aaron Shugar, Mellon Foundation Professor of Conservation Science (inorganic materials), Art Conservation Department, State University of New York, Buffalo State, **USA**

Dr. Aaron Shugar received his PhD in Archaeometallurgy from the Institute of Archaeology, UCL. Aaron served as Co-Director of the Archaeometallurgy Laboratory at Lehigh University, PA and was a visiting scientist at the Smithsonian Center for Materials Research and Education. He has published widely and conducted scientific analysis on archaeology material as well as works of art in museums and academic settings for over 20 years and taught in archeological, materials science, and art conservation programs over that time.

Kyna Biggs, Conservation Scientist, Conservation Science and Preventive Conservation Department, Parks Canada, **Canada**



Kyna Biggs is a conservation scientist at Parks Canada. She conducts material analysis of heritage objects from Canadian built heritage and archaeological sites. She obtained a Bachelor of Science in Molecular/Cellular Biology with a minor in Art History from the University of Ottawa, then completed a Master of Art Conservation at Queen's University in conservation science. Her research explored the susceptibility of acrylic paints to mould under different environmental conditions. Kyna has previously held positions at the Geological Survey of Canada and the Canadian Conservation Institute and has taught within the Master of Art Conservation program at Queen's University.