



International conference  
on analytical techniques  
in art and cultural heritage  
**LISBON | 07-12 MAY**



**BOOK OF ABSTRACTS**

# TECHNICAL INFORMATION

## TECHNART2023 BOOK OF ABSTRACTS

### TITLE

TECHNART2023

Non-destructive and Microanalytical Techniques in Art and Cultural Heritage. Book of Abstracts

### EDITORS

Marta Manso, Vanessa Antunes, Maria Luísa Carvalho

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### NOTE

Authors are responsible for the text included in the abstracts, for the reliability and truthfulness of the information and for the rights to publish any material included in the text

# FOREWORD

The first **TECHNART** conference was held in Lisbon in 2007 by the initiative of the Atomic Physics Center from the University of Lisbon, current Laboratory for Instrumentation, Biomedical Engineering and Radiation Physics (LIBPhys). The conference aimed to provide a cultural heritage science forum where the use of analytical techniques in art and cultural heritage were presented and discussed.

After five editions held in different European cities and a hiatus of four years due to COVID, it is a privilege to welcome in 2023, once more in Lisbon, the **TECHNART** conference.

The conference topics covers the application of a large range of analytical methods to art and cultural heritage investigations, namely X-ray analysis, confocal X-ray microscopy, synchrotron, ion beam and neutron-based techniques, FT-IR and Raman spectroscopy and microscopy, UV-Vis and NIR absorption/reflectance and fluorescence, laser-based analytical methods, magnetic resonance techniques, chromatography and mass spectrometry, optical and coherent imaging techniques, remote sensing and hyperspectral imaging.

The **TECHNART2023** program is organized in thematic sessions on analytical methods and their application to art and cultural heritage. Eight invited speakers will open thematic sessions on analytical methodologies, textiles, pigments and dyes, varnishes and resins, and metals. For four days, **TECHNART2023** brings in over 180 oral communications in three parallel sessions and more than 260 posters distributed in four sessions. The abstracts from oral and poster communications are collected in this book.

The conference accounts circa 400 participants representing around 50 countries from all over the world, offering an outstanding opportunity for exchanging knowledge and establishing new networks with other cultural heritage science researchers.

**TECHNART2023** results from the straight collaboration between LIBPhys and the other organizing institutions (NOVA School of Science and Technology, Faculdade de Ciências da Universidade de Lisboa, Universidade de Coimbra, Associação para o Desenvolvimento do Departamento de Física da Universidade de Coimbra) with the support from the TECHNART International Scientific Committee. It was equally important the partnership with Centro HERCULES, Museu Nacional do Azulejo, Microchemical Journal, and Journal of Cultural Heritage, as well as the participation of the commercial companies (HIROX Europe, OPUS instruments, NIREOS, BRUKER, FORENSCOPE) and the sponsoring of Heritage journal, Xpecam commercial company and the European X-ray Spectrometry Association (EXSA).

*Marta Manso and Maria Luísa Carvalho, May 2023 (Chairs)*



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## CONFERENCE PROGRAMME - TIMETABLE

	07 May	08 May	09 May	10 May	11 May	12 May
08h30		Registration				
09h00		Opening session	Invited speaker	Invited speaker	Invited speaker	
09h20		Invited speaker				
10h00		OP	OP	OP	OP	
10h30		OP				Visit to MNaz
11h00		Coffee break	Coffee break	Coffee break	Coffee break	
11h30		OP	OP	OP	OP	
12h30						
13h00		Lunch break				
13h30		Lunch break	Lunch break	Lunch break	Lunch break	
14h00	Registration					
14h30		Invited speaker	Invited speaker	Invited speaker	Invited speaker	
15h00		OP	OP & CS	OP	OP	
16h00						
16h30		Coffee break	Coffee break	Coffee break	Coffee break	
17h00	Welcome reception	Poster Session 1			Poster Session 4	
18h00		Poster Session 2	Poster Session 3			
18h30					Closing session	
20h00				Conference dinner		

OP Oral Presentations

CS Commercial session

## THEMATIC SESSIONS

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## ORAL COMMUNICATIONS

SUNDAY 7TH   BUILDING C3 - HALL	
14h00	Registration
17h00	Welcome reception
18h00	
MONDAY 8TH   BUILDING C3 - AUDITORIUM 3.2.14	
08h30	Registration
09h00	Opening Session
SESSION A - ANALYTICAL METHODS   CHAIRED BY KOEN JANSSENS	
09h20	António Candeias <i>Non-invasive and imaging techniques for the study and conservation of cultural heritage - the HERCULES Lab experience</i>
10h00	441 Sebastian Schöder, Katharina Müller, Emilie Bérard, Angélique Rouquié, Laurent Tranchant, Pierre Gueriau, Mathieu Thoury, Serge Cohen and Loïc Bertrand <i>First results from the PUMA synchrotron beamline, dedicated to heritage studies</i>
10h15	1082 Maria Eugenia Villafane, Nathan Daly, Christine Kimbriel, Catherine Higgitt and Pier Luigi Dragotti <i>Registration of multimodal images of artworks: an approach based on mutual information</i>
10h30	891 Giuseppe Capobianco, Lucilla Pronti, Martina Romani, Simone Di Filippo, Giuseppe Bonifazi, Mariangela Cestelli Guidi and Silvia Serranti <i>Multi-sensor imaging coupled with chemometric techniques for the characterization of pictorial materials</i>
11h00	Coffee break
SESSION A - ANALYTICAL METHODS   CHAIRED BY ANTÓNIO CANDEIAS	
11h30	1597 Kalliopei Tsampa, Effrosyni Androulakaki, Panagiotis Assiouras, Pawel Wrobel and Andreas Germanos Karydas <i>Development and characterization of a modular MA-XRF spectrometer for Cultural Heritage applications</i>
11h45	1883 Francesca Assunta Pisu, Stefania Porcu, Pier Carlo Ricci, Carlo Maria Carbonaro, Carla Cannas, Valentina Mameli, Rita Teresa Melis, Stefano Naitza and Daniele Chiriu <i>Innovative method for provenance study: a new algorithm based on observables from high-resolution Raman spectra</i>
12h00	1403 Francesco Paolo Romano, Costanza Miliani, Claudia Caliri, Claudia Giuseppina Fatuzzo, Giulia Maria Privitera, Eva Luna Ravan, Dario Zappalà and Zdenek Preisler <i>A novel MA-XRD/MA-XRF scanner for pigment-specific mapping of paintings</i>
12h15	6005 Candida Moffa, Fernando Jr. Piamonte Magboo, Luigi Palumbo, Anna Candida Felici and Massimo Petrarca <i>Non-invasive identification of coloring materials based on terahertz continuous-waves (THz-CW) spectroscopy</i>
12h30	6281 Claudia Conti, Alessandra Botteon, Alberto Lux, Marco Realini, Pavel Matousek and Pietro Strobbia <i>Evolution of Raman Spectroscopy for Cultural Heritage: advanced prototypes</i>
13h00	Lunch break (Building C7)
SESSION A - ANALYTICAL METHODS   CHAIRED BY FRANCESCO GRAZZI	
14h30	Matthias Alfeld <i>Integrated Multi-modal approaches for Imaging of Cultural Heritage Objects</i>
15h00	6459 Giulia Marcucci, Antonella Scherillo and Daniela Di Martino <i>Advances in neutron resonance absorption imaging for material characterisation</i>
15h15	6566 Eugenia Geddes da Filicaia, David Peggie and Richard Evershed <i>Direct inlet pyrolysis GC-QToF-MS for the study of organic materials in cultural heritage</i>
15h30	7153 Claudia Caliri, Claudia Giuseppina Fatuzzo, Danilo Paolo Pavone, Giulia Maria Privitera, Eva Luna Ravan, Zdenek Preisler, Costanza Miliani and Francesco Paolo Romano <i>A novel mobile MA-XRF scanner based on a hodoscopic multi-detector system for application in the cultural heritage field</i>
15h45	7475 Loïc Bertrand, Sebastian Schoeder, Ineke Joosten, Samuel Webb, Mathieu Thoury, Thomas Calligaro, Étienne Anheim and Aliz Simon <i>Ten years of practical advances towards safer analysis of heritage samples and objects</i>
16h00	7802 Matteo Cataldo, Adrian D. Hillier, Katsu Ishida, Massimiliano Clemenza, Oliviero Cremonesi, Francesco Grazzi and Simone Porcinai <i>Using negative muons for the characterization of thin layers in cultural heritage science</i>
16h15	9580 Vasiliki Kantarelou, Timofej Chagovets, Nina Gamaiunova, Maksym Tryus, Filip Grepł, Francesco Schillaci, Daniele Margarone and Lorenzo Giuffrida <i>Optimization of a laser-driven X-ray source for X-ray Fluorescence applications on Cultural Heritage</i>
16h30	Coffee break
17h00	Poster session 1
18h30	



**MONDAY 8TH | BUILDING C3 - AUDITORIUM 3.2.15****SESSION B - CERAMICS | CHAIRED BY MARCIA RIZZUTTO**

10h00	2340	<u>Weronika Patrycja Polańska</u> , Lavinia de Ferri, Knut Ivar Austvoll and Calin Constantin Steindal <i>A multi-method approach to Bronze Age ceramics from Hunn, Eastern Norway</i>
10h15	4502	<u>Luis Filipe Vieira Ferreira</u> , Isabel Ferreira Machado, Manuel Francisco Costa Pereira and Celso Mangucci <i>Archaeometry of 16th to 18th c. tiles produced in the Lisbon area</i>
10h30	5808	<u>Mario Bandiera</u> , Umberto Veronesi, Marta Manso, Alexandre Pais, Lurdes Esteves, Andreia Ruivo, Marcia Vilarigues and Susana Coentro <i>Unveiling the colours of the 17th-18th century azulejos using a multi-analytical non-invasive approach</i>
11h00		Coffee break

**SESSION B + C - CERAMICS + GLASS AND RELATED MATERIALS | CHAIRED BY FRANCESCA ROSI**

11h30	6445	<u>Paolo d'Imporzano</u> , Haske Reiling, Jolanda van Iperen, Isabelle Garachon, Katrien Keune and Gareth Davies <i>Lead Isotope Analysis of Delftware via Portable Laser Ablation</i>
11h45	7645	<u>David Buti</u> , Claudia Caliri, Brenda Doherty, Davide Domenici, Giulia Privitera, Donata Magrini, Costanza Miliani, Loretta Paderni, Aldo Romani, Francesco Paolo Romano, Francesca Sabatini and Francesca Rosi <i>Mesoamerican Mosaics from the collection of Museo delle Civiltà (MUCIV): A Multi-analytical scientific study</i>
12h00	9268	<u>Maria Labate</u> , Maurizio Aceto, Mauro Palumbo, Lorenza Operti and Angelo Agostino <i>Predictions by pXRF raw spectra: classification of medieval enamels by machine learning</i>
12h15	4756	<u>George Karagiannis</u> , Theodoros Karagiannis, Evdioxios Mimis, Thomas Mafredas, Chrysafenía Pardalidou, Mattheos Koutsoumanis and Emmanuel Karagiannis <i>A holistic in-situ non-destructive approach for supporting the conservation on archaeological sites. The case of conservation of mosaics from ancient Plotinopoli, Didymoteicho, Greece.</i>
13h00		Lunch break (Building C7)

**SESSION D + E + F - SUSTAINABLE CONSERVATION + ARCHAEOLOGICAL MATERIALS + LEATHER  
CHAIRED BY ILARIA COSTANTINI**

15h00	1053	<u>Martina Romani</u> , Simone Lemmers, Lucilla Pronti, Gihan Kamel, Kirsi Lorentz and Mariangela Cestelli Guidi <i>Optimization of the methodology for the FT-IR spectroscopic characterization of archaeological human long bone samples</i>
15h15	1263	<u>Laura Giuliani</u> , Chiara Genova, Valeria Stagno, Alessandro Ciccola, Silvia Capuani and Gabriele Favero <i>HVPD-hydrogel as a smart cleaning solution for removal of corrosion patinas on carbonate stone materials</i>
15h30	2718	<u>Noemi Proietti</u> , Valeria Di Tullio, Cristina Carsote, Iliara Quaratesi and Elena Badaea <i>NMR spectroscopy and micro-analytical techniques for studying the corami (gilt and painted leather) wall coverings from Chigi Palace, Italy</i>
15h45	3545	<u>Federica Nardella</u> , Marco Mattonai, Riccardo Andreozzi and Erika Ribechini <i>Long-lasting flavor compounds of myrtle and helichrysum from ancient Egyptian tombs: a study by multi-shot analytical pyrolysis</i>
16h00	2283	<u>Mingrui Zhang</u> , Zonghui Zhang, Fang Wang, Jie Liu, Yong Lei and Keyong Tang <i>Pyrolysis Kinetics and Product Analysis of Vegetable-tanned Leather by TG and TG-FTIR-MS</i>
16h30		Coffee break
17h00		Poster session 1
18h30		

**MONDAY 8TH | BUILDING C3 - AUDITORIUM 3.2.13****SESSION G - EASEL PAINTINGS | CHAIRED BY IDOIA ETXEBARRIA**

10h00	146	<u>Catherine Defeyt</u> , Kevin Thomas, Dominique Marchal and David Strivay <i>Jean-Auguste-Dominique Ingres' pictorial praxis by a mutli-analytical approach</i>
10h15	880	<u>Marcella Ioele</u> , Alessandro Ciccola and Paolo Postorino <i>The Deposition by Raffaello Sanzio, analytical insights on cross sections for the characterization of pictorial palette</i>
10h30	1354	<u>Giulia Sara de Vivo</u> , Francesca Gabrieli and Annelies van Loon <i>New findings on the Rijksmuseum Holy Family attributed to Giovanni Larciani. The role of complementary non-invasive analytical techniques such as MA-XRF and RIS.</i>
10h45	1858	<u>Francesco Caruso</u> , Tine Frøysaker, Silvia Garrappa, Noëlle L.W. Streeton, Jan Dariusz Cutajar, Lena Porsmo Stoveland, Thierry Ford and Maite Maguregui <i>Non-destructive vibrational spectroscopy study of Edvard Munch's monumental Aula Paintings</i>
11h00		Coffee break

## SESSION G - EASEL PAINTINGS | CHAIRED BY ANA LUÍSA SILVA

11h30	2875	Anna Mazzinghi, Chiara Ruberto, <u>Lisa Castelli</u> , Pier Andrea Mandò, Lorenzo Giuntini and Francesco Taccetti <i>The Portrait of Leo X by Raffaello: characterisation of the painting materials and techniques by means of MA-XRF</i>
11h45	2936	<u>Guusje Harteveld</u> , Francesca Gabrieli, Kathrin Pilz, Muriel Geldof, Inez van der Werf, Luc Megens, Maarten van Bommel, Lars Maxfield, Dominique van Berkum, Anna Vilanova and Ana Martins <i>Multi-scale and multi-technical survey of Van Gogh's Small Pear Tree in Blossom to create a digital twin</i>
12h00	3468	<u>Frederik Vanmeert</u> , Elke Oberthaler, Sabine Penot, Katharina Uhler, Annelies van Loon, Anna Krekeler, Ige Verslype, Abbie Vandiver, Carol Pottash, Katrien Keune and Koen Janssens <i>An investigation into the materials of Vermeer's The Art of Painting using MA-XRF and MA-XRPD</i>
12h15	4550	<u>Elvira Scialla</u> , Jessica Brocchieri, Marianna Merolle, Palma Maria Recchia, Roberto Della Rocca, Antonio D'Onofrio and Carlo Sabbarese <i>Study of the 'Adoration of the Magi' by Artemisia Gentileschi with multispectral imaging and XRF analysis</i>
12h30	6842	<u>Raphael Moreau</u> , Svetlana Gasanova, Nikolas Bakirtzis and Sorin Hermon <i>New insights on Titian's Ecce Homo materiality by coupled MA-XRF, RIS and LIS scanning</i>
12h45	7402	<u>Dafne Cimino</u> , Angelo Agostino, Paola Artoni, Claudia Daffara and Monica Molteni <i>Beyond the youth smile: investigating techniques and materials in Caroto's paintings</i>
13h00		Lunch break (Building C7)

## SESSION G - EASEL PAINTINGS | CHAIRED BY SOFIA PESSANHA

15h00	7633	<u>Steven De Meyer</u> , Victor Gonzalez, Letizia Monico, Iryn Bijker, Sara Carboni Marri, Francesca Gabrieli, Mathieu Thoury, Roald Tagle, Michele Girona, Loïc Bertrand and Koen Janssens <i>Casting light on Robert Delaunay's palette: a multimodal approach using MA-XRPD/XRF</i>
15h15	7660	<u>Marcia de Almeida Rizzutto</u> , Renata D.F.M. Rocco, Julia Schenatto, Juliana Bittencourt Bovolenta, Wanda Gabriel Pereira Engel, Marcia Sampaio Barbosa and Ana G. Magalhães <i>Massimo Campigli, an Italian painter, studied with non-invasive and portable analytical techniques</i>
15h30	7844	<u>Ana Machado</u> , Sara Valadas, Peter Vandenabeele, António Candeias, Ana Teresa Caldeira, Luís Piorro and Teresa Reis <i>Combining in situ Elemental and Molecular Analysis: the Vice-Roys Portraits in Old Goa, India</i>
15h45	8384	<u>Frédérique Broers</u> , Annelies van Loon, Victor Gonzalez, Francesca Gabrieli, Jorien Duivenvoorden, Jan Garrevoet, Petria Noble, Koen Janssens, Florian Meirer and Katrien Keune <i>Correlative X-ray Fluorescence and Ptychography Tomography at the Nanoscale Elucidate Different Small Mixtures used in The Night Watch</i>
16h00	8765	<u>Kostas Hatzigiannakis</u> , Kristalia Melessanaki, Anna Moutsatsou, Agni Terlizi, Elina Kavalieratou, Kalliopi Tsampa, Effrossyni Androulakaki, Panagiotis Assiouras, Demetrios Anglos and Andreas Germanos Karydas <i>Evaluation of the combined application of elemental and imaging spectroscopies for the non-invasive analytical characterization of 19th century paintings</i>
16h15	6635	<u>Francesca Gabrieli</u> , Annelies Van Loon, Anna Krekeler, Ige Verslype and Katrien Keune <i>Johannes Vermeer under different wavelengths</i>
16h30		Coffee break
17h00		Poster session 1
18h30		

## TUESDAY 9TH | BUILDING C3 - AUDITORIUM 3.2.14

## SESSION H - TEXTILES | CHAIRED BY PAULA NABAIS

09h00		Diego Tamburini <i>From Europe to Asia: on the introduction of early synthetic dyes in traditional dyeing practice</i>
09h30	1288	<u>Ludovico Geminiani</u> , Cristina Corti, Moira Luraschi, Sila Motella and Laura Rampazzi <i>Analytical investigation into cellulosic materials from traditional Japanese samurai armours</i>
09h45	1470	<u>Alessia Melelli</u> , Camille Goudenhooff, Loren Morgillo, Sylvie Durand, Johnny Beaugrand, Anita Quiles, Timm Weitkamp, Mario Scheel, Frédéric Jamme and Alain Bourmaud <i>Cutting-edge techniques for the investigation of ancient flax textiles</i>
10h00	1682	<u>Constantina Vlachou-Mogire</u> , Moira Bertasa, John R Gilchrist, Jon Danskin and Kathryn Hallett <i>Historic tapestry dye analysis with hyperspectral imaging</i>
10h15	3848	<u>Hortense de La Codre</u> , Rémy Chapoulie, Laurent Servant and Aurélie Mounier <i>A comprehensive methodology for the characterisation of 18th-century tapestry dyeing materials: between point analyses and hyperspectral imaging</i>
10h30	5773	<u>Pauline Claisse</u> , Francesca Galluzzi, Floréal Daniel, Rémy Chapoulie, Mohamed Dallel and Aurélie Mounier <i>SWIR hyperspectral imaging to unveil the numerous restorations of the Lady and the Unicorn tapestry (15th C, Musée de Cluny)</i>

10h45	9005	<u>Mila Crippa</u> , Paula Nabais, João Carlos Lima and Dominique Cardon <i>New insight into lac dye reds: optimization of portable molecular fluorescence for the characterization of dyed textiles</i>
11h00		Coffee break
<b>SESSION A - ANALYTICAL METHODS   CHAIRED BY FRANCESCO PAOLO ROMANO</b>		
11h30	3322	<u>Zdenek Preisler</u> , Rosario Andolina, Andrea Busacca, Claudia Caliri, Costanza Miliani and Romano Paolo <i>MA-XRF imaging of paintings: comparative studies by using classical analysis and artificial intelligence</i>
11h45	3373	<u>Lauren Dalecky</u> , Simo Huotari, Jean-Pascal Rueff, Christoph Sahle, Alessandro Mirone, Laure Cazals, Agnès Desolneux, Ilaria Bonaduce, Uwe Bergmann, Aurélie Chevalier and Loïc Bertrand <i>Inelastic X-ray Scattering: A new probe to identify and image artists' materials</i>
12h00	5251	<u>Amelia Suzuki</u> , Cristiano Riminesi and Haida Liang <i>Assessment of synchrotron X-ray alteration on paintings with time and spatially resolved VIS-NIR Hyperspectral imaging</i>
12h15	5756	<u>Emanuela Grifoni</u> , Emma Vannini, Irene Lunghi, Petra Farioli, Andrea Santacesaria, Marina Ginanni and Raffaella Fontana <i>Multi-sensor points cloud Data Fusion for metrological analysis and monitoring of a Renaissance panel paintings</i>
12h30	4133	<u>Clément de Mecquenem</u> , Myriam Eveno, Katharina Müller, Sebastian Schoeder, Marine Cotte and Ina Reiche <i>Investigation of the influence of lead white on the alteration mechanism of smalt in paintings by SR <math>\mu</math>XRD and <math>\mu</math>XANES</i>
12h45	8874	<u>Tiago Veiga</u> , Paula Nabais, Andreia Ruivo, João Carlos Lima, Vanessa Otero and Márcia Vilarigues <i>Improving the identification of red lake pigments on historical hand-painted magic lantern glass slides</i>
13h00		Lunch break (Building C7)
<b>SESSION A - ANALYTICAL METHODS   CHAIRED BY MATTHIAS ALFELD</b>		
14h30		Francesca Rosi <i>Strengthening the MOLAB platform of E-RHIS through advanced hyperspectral chemical imaging at the macro-scale</i>
15h00	3394	<u>Maximilian Kiss</u> , Francien G. Bossema, Paul van Laar, Suzan Meijer, Tristan van Leeuwen, K. Joost Batenburg and Felix Lucka <i>Object-tailored CT scans for cultural heritage objects</i>
15h15	3699	<u>Miriana Marabotto</u> , Leila Es Sebar, Sabrina Grassini, Oleh Yatsuk, Monica Gulmini, Leandro Sottili, Alessandro Lo Giudice and Alessandro Re <i>Characterization of portable X-Ray Fluorescence instruments for non-invasive analyses in archaeometry</i>
15h30	9941	<u>Francien Bossema</u> , Paul van Laar, Daniel O'Flynn, Joanne Dyer, Tristan Van Leeuwen, Suzan Meijer, Erma Hermens and K. Joost Batenburg <i>Fusing 3D imaging modalities for the interior and external investigation of cultural heritage objects</i>
15h45	9948	<u>Alessia Di Benedetto</u> , Marta Ghirardello, Daniela Comelli and Gianluca Valentini <i>A novel multi-modal optical microscope combining Raman and photoluminescence mapping</i>
16h00	2953	<u>Vaclav Krupicka</u> , Florent Grelard, Landry Blanc, Julie Arslanoglu, Nicolas Desbenoit and Caroline Tokarski <i>Paint cross-section layer composition identification and prediction using MALDI-MSI</i>
16h30		Coffee break
17h00		Poster Session 2
18h30		
<b>TUESDAY 9TH   BUILDING C3 - AUDITORIUM 3.2.15</b>		
<b>SESSION I - GRAPHIC DOCUMENTS   CHAIRED BY JOÃO CRUZ</b>		
09h30	431	<u>Floriana Coppola</u> , Luca Frigau, Jernej Markelj, Jasna Malešič, Claudio Conversano and Matija Strlič <i>Machine learning and NIR spectroscopy for dating of books</i>
09h45	1313	<u>Jacek Bagniak</u> , Dominika Pawcenis, Monika Koperska, Adriano Mosca Conte, Mauro Missori and Joanna Profic-Paczkowska <i>Characterization of ancient paper degradation state - micro- and noninvasive multimethod approach</i>
10h00	1610	<u>Catarina Miguel</u> , Silvia Bottura-Scardina, Ana Teresa Caldeira, Pedro Flor and António Candeias <i>To be or not to be - what can material analysis say about the so-called Infante D. Henrique in the Crónica Geral da Guiné?</i>
10h15	1728	<u>Marc Vermeulen</u> , Claudia Conti and Alessandra Botteon <i>Seeing through the surface - micro-Spatially Offset Raman Spectroscopy Imaging on paper-based archival documents</i>
10h30	1885	<u>Lucile Brunel-Duverger</u> , Laurence de Viguerie, Victorien Georges, Jeremy Le Bellego, Leila Sauvage and Emeline Pouyet <i>In-situ multimodal study of 18th c. pastels</i>

10h45	9150	<u>Raphaël Moreau</u> , Charlotte Denoël, Laurent Pichon and Thomas Calligaro <i>Investigating the polychromy of the Saint-Sever Beatus illuminated manuscript by exploiting spatially coupled XRF/RIS/LIS mappings</i>
11h00		Coffee break
<b>SESSION I - GRAPHIC DOCUMENTS   CHAIRED BY OLIVER HAHN</b>		
11h30	2120	<u>Ekaterina Pasnak</u> , Sílvia Sequeira and Jasna Malešič <i>Multi-analytical survey of the Norwegian Sea Trade Archive collection of manuscripts with iron-gall ink</i>
11h45	2324	<u>Linguan Cao</u> , Xinyan Jiang, Chunsheng Yan and Hui Zhang <i>Research on Near-infrared Spectroscopy and Raman Spectroscopy of Handmade Paper Based on Machine Learning</i>
12h00	2357	<u>Márcia Vieira</u> , Maria João Melo and Paula Nabais <i>Going green: The secret behind a fragile yet remarkable medieval color</i>
12h15	3045	<u>Zina Cohen</u> , Till Hennings, Oliver Hahn, Philippe Depreux and Ira Rabin <i>Ink Analysis in Carolingian Manuscripts: A Study in black and red</i>
12h30	3504	<u>Gael Latour</u> , Margaux Schmeltz, Laurianne Robinet, Sylvie Heu-Thao, Giulia Galante and Marie-Claire Schanne-Klein <i>Non-invasive quantitative assessment of collagen degradation in parchments by polarization-resolved SHG microscopy</i>
12h45	3948	<u>Luís Manuel de Almeida Nieto</u> , Lukasz G. Migas, Joris Dik, Matthias Alfeld and Raf Van de Plas <i>Advancing the Analysis of Historical Manuscripts by Combining Machine Learning with Reflectance Imaging Spectroscopy</i>
13h00		Lunch break (Building C7)
<b>SESSION I - GRAPHIC DOCUMENTS   CHAIRED BY CATARINA MIGUEL</b>		
15h00	4507	<u>Gianluca Pastorelli</u> , Annette S. Ortiz Miranda, Ermanno Avranovich Clerici, Paolo d'Imporzano, Koen Janssens, Gareth R. Davies and Niels Borring <i>A multi-analytical study of lead white darkening in old master drawings at the National Gallery of Denmark</i>
15h15	5343	<u>Fabiana Di Gianvincenzo</u> , Hassan Ebeid, Irena Kralj Cigic and Matija Strlič <i>Chromatographic analysis of natural dyes used in Islamic paper manufacture</i>
15h30	5578	<u>Arthur Gestels</u> , Thomas De Kerf, Frederik Vanmeert, Francesca Gabrieli, Koen Janssens, Gunther Steenackers and Steve Vanlanduit <i>Calibration of reflectance imaging spectroscopy using MA-XRPD for 16th century illuminated manuscript</i>
15h45	5757	<u>Barbara Wagner</u> , Jakub Karasiński, Ludwik Halicz, Piotr Targowski, Dorota Jutrzenka-Supryn, Ewa Chlebuis, Paulin Pludra-Zuk, Monika Opalińska and Zofia Stos-Gale <i>Pb isotope-based studies of manuscripts' origin: non-invasive tracing of parchment fragments to the 11th century</i>
16h00	6022	<u>Natércia Teixeira</u> , Hugo Cruz, André Neto E Silva, Luís Cunha-Silva, Paula Nabais, Fernando Pina, Victor de Freitas and Maria João Melo <i>Medieval writing: the chemistry behind iron gall inks</i>
16h15	6086	<u>Grzegorz Nehring</u> , Oliver Hahn and Ira Rabin <i>Exotic writing inks and how to identify them</i>
16h30		Coffee break
17h00		Poster Session 2
18h30		

**TUESDAY 9TH | BUILDING C3 - AUDITORIUM 3.2.13****SESSION C - GLASS AND RELATED MATERIALS | CHAIRED BY SOPHIE WOLF**

09h30	2651	<u>Emma Paolin</u> , Fabiana Di Gianvincenzo, Irena Kralj Cigic and Matija Strlič <i>Chemical and sensory analysis of a perfume flask with gas chromatography-olfactometry</i>
09h45	1743	<u>Victoria Corregidor</u> , Luís C. Alves, Inês I. Mendes da Silva, Ana L. Rodrigues, António P. Gonçalves, Luís Ferreira, Miguel Reis, Cristina Chaves, Dulce Russo and Rosa Marques <i>Non-destructive characterization of colored mineral glazed beads</i>
10h00	2284	<u>Grégoire Chêne</u> , Bernard Gratuze, Patrick Degryse, David Strivay and Line Vanwersch <i>Early medieval age glass production techniques studies : an Inter-laboratory and multi-analytical techniques intercomparison campaign</i>
10h15	5939	<u>Francesca Gherardi</u> , Marine Cotte, Ewan Campbell, Rachel Tyson and Sarah Paynter <i>Investigating the role of iron and manganese oxides in colouring late antique glass by XANES and micro-XRF spectroscopies</i>
10h30	5718	<u>Carla Machado</u> , Mohamed Oujja, Marina Martínez-Weinbaum, Laura Maestro-Guijarro, Marta Castillejo, Márcia Vilarigues and Teresa Palomar <i>Laser-based techniques for the characterization of historically accurate grisaille paint reproductions</i>

10h45	6015	<u>Hon Wen Chen</u> and Chin Ssu Cheng <b><i>Nondestructive XRD (X-ray Diffraction) crystallization and XRF (X-ray fluorescence) analysis of Taiwan indigenous glass beads</i></b>
11h00		Coffee break
<b>SESSION C + A - GLASS AND RELATED MATERIALS + ANALYTICAL METHODS   CHAIRED BY ANDREAS KARYDAS</b>		
11h30	6341	Sophie Wolf, <u>Alessandra Vichi</u> and Francesco Caruso <b><i>Unveiling the secrets of 'verre églomisé' paintings: potential and limits of a non-destructive analysis</i></b>
11h45	8160	<u>Oleh Yatsuk</u> , Sabrina Molinaro, Patrizia Davit, Anzhelika Kolesnychenko, Stanislav Zadnikov, Iryna Shramko, Lorena Carla Giannossa, Annarosa Mangone, Giulia Berruto, Roberto Giustetto and Monica Gulmini <b><i>Analysis of vitreous beads from the Iron Age site of Bilsk hillfort (Ukraine): an insight into glass-making technology and trade networks.</i></b>
12h00	9426	<u>Stefania Martiniello</u> , Claudia Sciuto, Antonella Capitanio, Giulia Lorenzetti, Stefano Legnaioli, Filippo Sala, Paolo Torriti and Simona Raneri <b><i>Portable XRF and Raman spectroscopies to outline the story of Medieval precious objects</i></b>
12h15	1573	<u>Alexandra Rodrigues</u> , Mario Bandiera, Paul van Laar, Erma Hermens and Márcia Vilarigues <b><i>Blue enamels. A preliminary non-invasive study of the blue enamels in objects from the Fitzwilliam Museum</i></b>
12h30	4474	Joana Palmeirão, Margarida Nunes, Ana Manhita, Maria Coutinho, Eduarda Vieira and <u>Teresa Ferreira</u> <b><i>The ceroplastic simulacra of Vitoria, Eleonora and Martian</i></b>
13h00		Lunch break (Building C7)
<b>COMERCIAL SESSION   CHAIRED BY MAURO GUERRA</b>		
15h00		Emilien Leonhardt, Hirox <b><i>100 billion pixel 3D color scan of Vermeer's Girl with a Pearl Earring using the Hirox digital microscope</i></b>
15h15		Marta Ghirardello, NIREOS <b><i>HERA: a novel hyperspectral camera for cultural heritage analysis</i></b>
15h30		Michele Gironda, Bruker Nano Analytics <b><i>Bruker Nano Analytics, Iconic Instruments for Art</i></b>
15h45		Hannah Conway-Laws, Opus Instruments <b><i>An Introduction to Opus Instruments: Leaders in Art &amp; Analysis</i></b>
16h00		Jani Santos, XpectraCAM <b><i>Optimization of Art Analysis methods based on the XpeCAM Solution</i></b>
16h30		Coffee break
17h00		Poster Session 2
18h30		
<b>WEDNESDAY 10TH   BUILDING C3 - AUDITORIUM 3.2.14</b>		
<b>SESSION J - PIGMENTS AND DYES   CHAIRED BY KOSTAS HATZIGIANNAKIS</b>		
09h00		Victor Gonzalez <b><i>Investigating the synthesis, use and alteration of historical pigments at the multi-scale</i></b>
09h30	4352	<u>Sanne Berbers</u> , Rika Pause, Inez van der Werf, Klaas Jan van den Berg and Maarten van Bommel <b><i>Fanal® pigments in the spotlight</i></b>
09h45	4366	<u>Silvia Garrappa</u> , Valentina Pintus, Anthony J. Baragona, David Hradil, Ferenc Szabo and Katja Sterflinger <b><i>Different shades of cadmium soaps in mock-up oil paints: first multi-analytical investigation</i></b>
10h00	6025	<u>Nina Deleu</u> , Steven De Meyer, Frederik Vanmeert, Geert Van der Snickt, Jana Sanyova and Koen Janssens <b><i>Combined in situ MA-XRPD and cross-section SR-<math>\mu</math>-XRPD imaging for the study of copper sulfates: an overlooked group of green copper pigments in Flemish Renaissance art</i></b>
10h15	6174	<u>Paula Nabais</u> , Mara Santo, Natércia Teixeira, Mila Crippa and Dominique Cardon <b><i>Molecular fluorescence: disclosing the dyeing formulations of weld yellows from 18th-century recipe books</i></b>
10h30	7057	Cyrielle Messenger, <u>Lucile Beck</u> , Dominique Blamart, Patricia Richard, Katarina Batur, Victor Gonzalez and Eddy Foy <b><i>Carbon isotopes in lead white: absolute dating and manufacturing process identification of the pigment</i></b>
10h45	8529	<u>Camilla Tartaglia</u> , Maria Pia Riccardi, Gianlorenzo Bussetti and Alberto Grimoldi <b><i>Micromorphological observations as a potential method to study indigo blues</i></b>
11h00		Coffee break



## SESSION J - PIGMENTS AND DYES | CHAIRED BY VICTOR GONZALEZ

- 11h30** 1349 Giovanni Cavallo, Mariapia Riccardi and Roberto Zorzin  
*A mineralogical and geochemical database of Fe-bearing mineral pigments from North-Eastern Italy*
- 11h45** 1820 Marta Magalini, Alessandro Lo Giudice, Alessandro Re, Laura Guidorzi, Alessandro Borghi, Massimo Vidale, Denny Frenéz, Toshi Nozaka, Leonardo La Torre, Laurent Pichon, Quentin Lemasson, Brice Moignard and Claire Pacheco  
*New light on the provenance of lapis lazuli found in Shahr-i Sokhta site using Ion Beam Analysis.*
- 12h00** 5131 Corentin Cou, Hortense de la Codre, Xavier Granier and Aurélie Mounier  
*Pearson correlation-based method on hyperspectral images for the study of similarity of pigments and dyes*
- 12h15** 6901 Lucia Burgio  
*The Renaissance of Indigenous American Lacquer - a Review of Current Research*
- 12h30** 7462 Ekaterina Morozova, Irina Kadikova and Svetlana Pisareva  
*Titanium dioxide-based paints produced in the USSR: a study of archival materials and reference samples*
- 12h45** 8288 Jorien Duivenvoorden, Federico Caporaletti, Sander Woutersen, Katrien Keune and Joen Hermans  
*DSC and cryo-FTIR indicate presence of water clusters in zinc-white oil paint*
- 13h00** Lunch break (Building C7)

## SESSION K - VARNISHES AND RESINS | CHAIRED BY EMLINE POUYET

- 14h30** Stamatis C. Boyatzis  
*Non-invasive infrared spectroscopy of varnishes on artworks*
- 15h00** 2243 Victoria Beltran, Andrea Marchetti, Patricio Guerrero, Ferenc Borondics, Christophe Sandt, Mario Scheel, Wim Dewulf, Ligia Maria Moretto and Karolien De Wael  
*The interaction between geranium lake particles and drying oil assessed by SR- $\mu$ FTIR and SR-XCT*
- 15h15** 3633 Chiara Chillè, Charis Theodorakopoulos and Marianne Odlyha  
*Further studies on the breakdown of selected natural and synthetic artists' varnishes upon Er:YAG laser irradiation*
- 15h30** 8131 Valentina Pintus, Carlotta Cozzani, Silvia Miklin, Paula Gassmann and Katja Sterflinger  
*Mind the cracks! Chemical and physical changes of blended Thitsiol/Urushiol Asian lacquers elucidated through a novel multi-analytical study*
- 15h45** 5207 Elisabet Serrat, Javier Becerra, Anna Vila and Aleix Barberà  
*Use of 3D Scanning to the study of craquelures on Joan Miró's "Pintura"*
- 16h30** Coffee break
- 17h00** Poster session 3
- 20h00** Dinner at *Casa do Alentejo*

## WEDNESDAY 10TH | BUILDING C3 - AUDITORIUM 3.2.15

## SESSION L - MURAL PAINTINGS | CHAIRED BY MAITE MAGUREGUI

- 09h30** 2586 Alice Dal Fovo, Jana Striova, Enrico Pampaloni, Irene Lunghi, Marco Raffaelli and Raffaella Fontana  
*Revealing unseen evidence of the hand of Masolino, Masaccio and Lippi in the Brancacci Chapel frescoes*
- 09h45** 2623 Iliara Costantini, Idoia Etxebarria, Iñaki Vázquez de la Fuente, Julene Aramendia, Gorka Arana, Irantzu Martínez-Arkarazo, Juan Manuel Madariaga, Macarena Sanz, Lucia Pérez, Angel Yedra, Beatriz Yécora and Tamara Oroz  
*Multi-technical approach for the study of the conservation state of mural paintings of Navalcarnero (Spain)*
- 10h00** 2885 Tiziana Lombardo, Marta Caroselli, Camilla Martinucci, Erwin Hildbrand, Patrizia Moretti and Patrick Cassitti  
*Investigation of the Carolingian and Romanesque wall paintings detached from the church of St. Johann in Müstair*
- 10h15** 9809 Valeria Di Tullio, Noemi Proietti, David Buti, Sveva Longo, Alberto Felici, Donata Magrini and Cristiano Riminesi  
*Water profile distribution inside wall paintings by NMR-MOUSE in combination with evanescent-field dielectrometry technique and near-IR reflectance spectroscopy*
- 10h30** 719 Sihan Zhao, Zhibo Zhou, Lin Zhang and Hui Zhang  
*Identification of Fake Gold Gilding Material in the Ancient Wall Paintings by Mass Spectrometry Imaging*
- 11h00** Coffee break

## SESSION L - MURAL PAINTINGS | CHAIRED BY MILENE GIL

- 11h30** 3854 Giusemi Frantzi, Harikleia Brekoulaki, Andreas Germanos Karydas, Georgios P. Mastrotheodoros, Stamatios Boyatzis and Panayiotis Theoulakis  
*Investigating colour on Archaic architecture: A case study on the Peisistrateion Telesterion at Eleusis*
- 11h45** 3863 Francesca Sabatini, David Buti, Fauzia Albertin, Brenda Doherty, Letizia Monico, Aldo Romani, Francesca Rosi, Maria Sileo, Nicodemo Abate, Antonio M. Amodio, Nicola Masini, Antonio Pecci and Laura Cartechini  
*Urban art in Milan: non-invasive analytical strategies for the study of street art murals*

12h00	4468	<u>Maite Maguregui</u> , Francesco Caruso, Francesco Gianni, Alessandra Vichi, Claudio Ventura Bordenca, Olivier Mathon and Marine Cotte <b><i>Metallic mercury, at last! Synchrotron radiation-based study on Pompeian cinnabar wall paintings</i></b>
12h15	7854	<u>Ermanno Avranovich Clerici</u> , Steven De Meyer, Frederik Vanmeert, Letizia Monaco, Costanza Miliani and Koen Janssens <b><i>Cumengeite in wall paintings, intentional application or secondary product?</i></b>
13h00		Lunch break (Building C7)
<b>SESSION I - GRAPHIC DOCUMENTS   CHAIRED BY VICTORIA CORREGIDOR</b>		
15h00	6148	<u>Michela Perino</u> , Edoardo Colonna, Anna Candida Felici, Vittoria Bruni, Domenico Vitulano and Michela Rosellini <b><i>New insight into the palimpsests of Ars Prisciani</i></b>
15h15	6315	<u>Sara Mazzocato</u> , Dafne Cimino and Claudia Daffara <b><i>Integrated microprofiling and multispectral imaging for full-field analysis of ancient manuscripts</i></b>
15h30	6494	<u>Heinz-Eberhard Mahnke</u> , Tzulia Angos, Tobias Arlt, Klaus Lips, Joseph E. McPeak and Verena Lepper <b><i>A New Approach for Accessing Hidden Text on Papyri Written with Carbon Ink*</i></b>
15h45	7594	<u>Lucia Pereira-Pardo</u> , Paul Dryburgh, Marc Vermeulen, Elizabeth Biggs, Peter Crooks, Adam Gibson, Molly Fort, Constantina Vlachou-Mogire, Moira Bertasa, John R Gilchrist and Jon Danksin <b><i>Reading the Unreadable. Advanced Imaging to Recover Illegible Text in Historic Documents</i></b>
16h00	7948	<u>Juliana Bittencourt</u> , Márcia Rizzutto, Wanda Engel, Maria Aparecida Borrego, Phablo Fachin, Regina Hauy, Jean Souza, Igor Cassemiro, Maria Luiza Lamardo and Mariza Koga <b><i>Material investigation on Italian and Portuguese papers from the Republican Museum Convention of Itu, Brazil</i></b>
16h15	8493	<u>Andrei Kazanskii</u> , Jitka Neoralová, Rita Lyons Kindlerová, Dana Novotná, Petra Vávrová, Daniel Vavřík, Ivana Kumpová, Michal Vopálenký and Tomáš Kyncl <b><i>The use of X-ray computed tomography and X-ray fluorescence in the research of historical printing from the 17th century</i></b>
16h30		Coffee break
17h00		Poster Session 3
20h00		Dinner at <i>Casa do Alentejo</i>
<b>WEDNESDAY 10TH   AUDITORIUM 3.2.13</b>		
<b>SESSION M + A - POLYMERS + ANALYTICAL METHODS   CHAIRED BY EVA MARISOLE</b>		
09h30	148	Eva Mariasole Angelin, <u>Anna Micheluz</u> and Marisa Pamplona <b><i>Investigation of the discoloration of polyurethane elastomeric plastics in computer heritage: have we met an analytical challenge?</i></b>
09h45	288	<u>Tjaša Rijavec</u> , Matija Strlič and Irena Kralj Cigić <b><i>Predicting the yellowing of PVC objects in heritage collections</i></b>
10h00	635	<u>Jacek Bagniuik</u> , Monika A. Koperska, Dominika Pawcenis and Joanna Profic-Paczkowska <b><i>A systematic approach to study natural polymer ageing and condition. Analysis contra model</i></b>
10h15	1262	Irene Bargagli, Laura Cartechini, Brenda Doherty, Francesca Sabatini, Martina Alunni Cardinali, Lucia Comez, Marco Paolantoni, Valeria Di Tullio, Noemi Proietti, Costanza Miliani, Daniele Fioretto, Elisa Storace, Sara Russo, Rafaela Trevisan and Francesca Rosi - <b><i>Mechano-chemical monitoring of plastic degradation: surface and sub-surface modification of artificially aged ABS</i></b>
10h30	5972	<u>Ioanna Mantouvalou</u> , Leona Bauer, Oleksandra Marushchenko, Ioannis Siouris, Maram Naes and Birgit Kanngießner <b><i>SynLab for cultural heritage - joint X-ray imaging and spectroscopy measurements at the synchrotron and in the laboratory</i></b>
10h45	5852	Wolfgang Kautek, <u>Valentina Ljubic Tobisch</u> , Klaudia Hradil, Karin Whitmore, Christina Strelí and Peter Wobrauschek <b><i>Surface Characterization of Austrian Daguerreotypes</i></b>
11h00		Coffee break
<b>SESSION N - SCIENTIFIC AND TECHNOLOGICAL HERITAGE   CHAIRED BY ISABEL TISSOT</b>		
11h30	902	<u>Aurore Malmert</u> , Clarisse Chavanne, Alain Brunelle and Emeline Pouyet <b><i>Non-invasive analyses of E. Chevreul's chromatic circles</i></b>
11h45	3785	<u>Jacopo La Nasa</u> , Catharina Bleensdorf, Eleonora Dolcher, Riccardo Ducoli, Serena Del Seppia, Jeannette J. Lucejko, Antonella Mannariti, Anna Micheluz, Francesca Modugno, Neva Capra, Lucia Giovannini, Maria Luisa Tomasi, Marisa Pamplona, Maria Perla Colombini, Ilaria Degano and Ilaria Bonaduce - <b><i>Aerospace technology as part of our heritage: characterization of aircraft materials and study of their degradation processes by analytical pyrolysis</i></b>
12h00	4606	<u>Lorna Brundrett</u> , Rebecca Ploeger, Aaron Shugar, Juan Juan Chen, Emily Hamilton and Theresa J. Smith <b><i>19th-Century Medical Saddlebag: An Analysis of the Medicinal Contents</i></b>

12h15	2101	<u>Miriam Pressato</u> , Teresa Lança Ruivo, Catarina Miguel, António Candeias and Sara Valadas <b><i>Study of 18th century Chinese wallpapers from the National Museum of Ancient Art (Lisbon): a multi-analytical approach</i></b>
12h30	4288	<u>Taren Ginter</u> , Megan Gallagher, Shaelyn Horvath, Josephine La Macchia, Sonia Marotta and Fiona E. McNeill <b><i>The Beautifying Properties of Historical White Lead Makeup</i></b>
12h45	5051	<u>Jens Gold</u> , Francesco Caruso, Noëlle Lynn Wenger Streeton and Maite Maguregui <b><i>Discovering Lippmann interferential colour photography at the Preus Museum through a non-invasive multianalytical approach</i></b>
13h00		Lunch break (Building C7)
<b>SESSION O - MODERN MATERIALS AND CONTEMPORARY ART   CHAIRED BY CLAUDIA CALIRI</b>		
15h00	8390	<u>Tea Ghigo</u> , Kelly Domoney, Daniel Bone and Andrew Beeby <b><i>Archival research and material analyses to explore artists' attitudes towards pigments' durability: John Ruskin and the 19th-century Colour Revolution</i></b>
15h15	8043	<u>Francesca Galluzzi</u> , Rémy Chapoulie, Floréal Daniel, Regine Bigorne, Laurent Vedrine and Aurélie Mounier <b><i>Goupil &amp; Cie and the democratisation of art in the 19th century: A non-invasive investigation of mechanical reproductions of artworks</i></b>
15h30	8343	<u>Fauzia Albertin</u> , Aldo Romani, Claudio Costantino, David Buti, Letizia Monico, Francesca Sabatini, Donata Magrini, Claudia Caliri, Claudia G. Fatuzzo, Zdenek Preisler, Francesco Paolo Romano, Costanza Miliani, Aurélie Tournie, Christine Andraud, Irina Crina Anca Sandu, Jin Strand Ferrer, Giorgio Luciano, Laura Cartechini and Francesca Rosi - <b><i>Multi-source data fusion of modern complex paintings</i></b>
15h45	9962	Pierre Taugeron, Sullivan Bricaud, Cindie Kehlet and <u>Jens Dittmer</u> <b><i>New techniques for NMR depth profiles with enhanced resolution and sensitivity and the study of mobile phases in paint layers, applied to a white Nevelson sculpture</i></b>
16h00	297	Stefano Legnaioli, Giulia Lorenzetti, <u>Luca Nodari</u> , Rosa Costantini, Patrizia Tomasin and Luciano Pensabene Buemi <b><i>"Ce n'est pas la colle qui fait le collage": the analytical challenge of Ernst's multi-material artworks</i></b>
16h30		Coffee break
17h00		Poster Session 3
20h00		Dinner at <i>Casa do Alentejo</i>

**THURSDAY 11TH | BUILDING C3 - AUDITORIUM 3.2.14****SESSION P - METALS | CHAIRED BY ROBERT VAN LANGH**

09h00		Isabel Tissot - <b><i>Through a metal darkly: How analytical techniques brighten the conservation of cultural heritage metallic objects</i></b>
09h30	603	<u>Stephen Merkel</u> , Paolo D'Imporanzo, Rory Naismith, Gareth Davies and Jane Kershaw <b><i>New application of portable laser sampling for Pb isotope analysis of silver</i></b>
09h45	2594	<u>Isabel Rute Fontinha</u> , Maria João Correia and Elsa Eustáquio <b><i>Electrochemical techniques for patinas and coatings assessment in conservation studies</i></b>
10h00	2762	<u>Alexandre Gillon</u> , Charbel Koumeir, Charlène Pelé-Méziani, Gildas Salaün, Ferid Haddad and Guy Louarn <b><i>Investigation of the new world silver provenance and trade in Europe during the 16th and 17th centuries: HE-PIXE and p-XRF spectroscopic analysis</i></b>
10h15	4056	<u>Javier Moreno-Soto</u> , Miguel A. Respaldiza, Simona Scrivano, Ruth Pliego, Blanca Gómez-Tubío, Enrique García-Vargas and Francisca Chaves-Tristan <b><i>An approach to the metallic composition of the Carthage mint coins from the tetrarchic hoard of Tomares</i></b>
11h00		Coffee break

**SESSION A+ Q - ANALYTICAL METHODS + PAINTS | CHAIRED BY STAMATIS BOYATZIS**

11h30	6957	<u>Pedro Alexandre Caetano Alves</u> and Francesca Caterina Izzo <b><i>The Molecular Clock of Ageing Oils</i></b>
11h45	2880	Ophélie Ranquet, Giulia Caroti, Rafaella Georgiou, Patrick Dietemann, Norbert Willenbacher, Celia Duce and <u>Iliaria Bonaduce</u> <b><i>Mass spectrometry and thermoanalytical techniques to understand the transition from egg tempera to oil paint in Italian Renaissance</i></b>
12h00	4783	<u>Ida Fazlic</u> , Marine Cotte, Victor Gonzalez, Frederik Vanmeert, Arthur Gestels, Steven De Meyer, Frédérique Broers, Joen Hermans, Annelies van Loon, Ermanno Avranovich Clerici, Koen Janssens, Petria Noble, Jitte Flapper, Bas De Bruin and Katrien Keune <b><i>Lead(II) Formate: from Historical to Model Paints</i></b>
12h15	3533	Lucie Laporte, Guylaine Ducouret, Sophie Rochut, Frédéric Gobeaux and <u>Laurence de Viguerie</u> <b><i>Influence of lead driers on oil paint properties</i></b>

12h30	3713	<u>Lucilla Pronti</u> , Martina Romani, Marcella loele, Ilaria Sinceri, Elena Cianca, Eleonora Gorga, Gloria Tranquilli, Francesca Fumelli and Mariangela Cestelli Guidi <b><i>Micro and Macro FT-IR spectroscopic imaging and mapping as a tool for the detection of degradation products and for monitoring the cleaning processes of painted surfaces</i></b>
12h45	7043	<u>Alba Alvarez Martin</u> , Teresa Scovacricchi, Jusal Quanico, Ermanno Avranovich Clerici, Geert Baggerman, Frederik Vanmeert, Arthur Gestels and Koen Janssens <b><i>Tracking secondary products in aged paint cross-sections by MALDI-MS Imaging</i></b>
13h00		Lunch break (Building C7)
<b>SESSION P - METALS   CHAIRED BY DAVID BUTI</b>		
14h30		Francesco Grazzi <b><i>Non-invasive analysis of historical and archaeological metal artefacts through neutron imaging and neutron diffraction: highlights and case studio</i></b>
15h00	790	<u>Giulia Festa</u> , Claudia Caliri, Giulia Privitera, Claudia G. Fatuzzo, Danilo P. Pavone, Claudia Scatigno, Enrico Ferraris, Johannes Auenmüller, Costanza Miliani and Francesco Paolo Romano <b><i>Studying Ancient Egyptian metal vessels by X-ray diffraction and Machine Learning.</i></b>
15h15	955	<u>Yueer Li</u> , Lambert van Eijck, Francesco Cantini, Oriol Sans Planell, Marta Magalini, Johannes Auenmüller, Sara Aicardi, Valentina Turina, Luisa Vigorelli, Lorenzo Dotto, Alessandro Re, Alessandro Lo Giudice, Leila Es Sebar, Miriana Marabotto, Sabrina Grassini, Nicla Gelli and Francesco Grazzi <b><i>New insights into ancient Egyptian bronze votive coffins for animal mummies through Neutron Imaging and Neutron Activation Analysis</i></b>
15h30	8437	<u>Francesco Abate</u> , Michela De Bernardin, Maria Stratigaki, Giulia Franceschin, Fauzia Albertin, Matteo Bettuzzi, Rosa Brancaccio, Anita Bressan, Maria Pia Morigi, Salvatore Daniele and Arianna Traviglia <b><i>Renewing archaeological practice with modern technology: <math>\mu</math>XCT for the facile screening of excavated copper coins</i></b>
15h45	8566	<u>Francesco Armetta</u> and Maria Luisa Saladino <b><i>Methodological approaches for underwater archeological metals investigation</i></b>
16h30		Coffee break
17h00		Poster session 4
18h30		
<b>THURSDAY 11TH   BUILDING C3 - AUDITORIUM 3.2.15</b>		
<b>SESSION D - SUSTAINABLE CONSERVATION   CHAIRED BY KATRIEN KEUNE</b>		
09h30	276	<u>Maduka Lankani Weththimuni</u> , Chae-hoon Lee, Chiara Milanese, Barbara Vigani, Marco Malagodi, Silvia Rossi and Maurizio Licchelli - <b><i>A Comparative study of "green" and synthetic gels as tools for the cleaning of artifacts</i></b>
09h45	2796	<u>Lucrezia Barchi</u> , Gabriele Cencetti, Massimiliano Frattoni, Marco Michelozzi, Cristiano Riminesi, Aldo Romani, Francesca Rosi, Diego Sali, Francesca Vichi and Costanza Miliani <b><i>New strategies for VOCs control in museums showcases</i></b>
10h00	3363	<u>António Carrapiço</u> , Maria Rosário Martins, Ana Teresa Caldeira, Ana Cardoso, Elisabete Carreiro, José Mirão and Luís Dias <b><i>AgNPs applied to Cultural Heritage: Exploring its antimicrobial potential using "Green" approaches</i></b>
10h15	6250	<u>Chae-hoon Lee</u> , Maduka L. Weththimuni, Francesca Di Turo, Barbara Vigani, Fabio Beltram, Pasqualantonio Pingue, Silvia Rossi, Maurizio Licchelli, Marco Malagodi, Haejin Park, Yongjae Chung, Francesca Volpi and Giacomo Fiocco <b><i>Not Just for Eating! Alginate-based Gels and Their Application Studies</i></b>
10h30	7074	<u>Chiara Genova</u> , Marzia Beccaccioli, Alessandro Lazzara, Alessandro Ciccola, Simona Sennato, Gabriele Favero and Alessia Masi <b><i>Development of environmentally-friendly biocidal systems based on chitosan-nanoparticles loaded with R-(+)-pulegone to protect wood from fungal attack</i></b>
10h45	1612	<u>Francesca Ramacciotti</u> , Laure Cazals, Giorgia Sciotto, Rocco Mazzeo, Silvia Prati, Loïc Bertrand and Mathieu Thoury - <b><i>Photoluminescence MA-imaging for the assessment and study of new cleaning systems</i></b>
11h00		Coffee break
<b>SESSION E + R - ARCHAEOLOGICAL MATERIALS AND SITES + STONE   CHAIRED BY FRANCESCO CARUSO</b>		
11h30	3698	<u>Iñaki Vázquez de la Fuente</u> , Idoia Etxebarria, Ilaria Costantini, Marco Veneranda, Nagore Prieto Taboada, Giuseppe Di Girolami, Angela Di Lillo, Marina Caso, Mario Notomista, Rossella Di Lauro, Kepa Castro, Gorka Arana and Juan Manuel Madariaga - <b><i>Degradation of tuff buildings at the Archaeological park of Herculaneum (Italy): preliminary multianalytical study</i></b>
11h45	4798	<u>Ewa Bulska</u> , Mariusz Ziółkowski - <b><i>Analytical scenario for the investigation of Machu Picchu cultural heritage in Peru</i></b>

12h00	9285	<b>Jorge Sanjurjo Sánchez</b> , Rebeca Blanco-Rotea, Rosa Benavides, David Freire Lista, Jose Carlos Sánchez-Pardo, Isabel Prudêncio, Isabel Dias and Chris Burbidge <i>Absolute dating of building materials from the Santalla de Bóveda Monument (Lugo, NW Spain)</i>
12h15	7999	Rana Nur Karataş, <b>Amine Seyhun Alkan Reis</b> , Mahmud Çavur, Murat Güvenç, Yonca Erkan, Sude Erkmen and Fusun Alloğlu <i>Remote Sensing for Land Use and Land Cover Change: Interpretation of Iznik's Rural Heritage</i>
12h30	7243	Fernanda Carvalho, Maria Margarida Lima and João Pedro Veiga <i>Mineralogical identification of historical mortars from built heritage using Raman spectroscopy</i>
13h00		Lunch break (Building C7)
<b>SESSION R - STONE   CHAIRED BY PATRIZIA TOMASIN</b>		
15h00	783	<b>Sara Calandra</b> , Claudia Conti, Irene Centauro and Emma Cantisani - <i>Micro-Raman spectroscopy for identification of calcite types in historical mortars: applications in archaeometry</i>
15h15	3043	<b>Milena Anfosso</b> , Doria Costa, Laura Gaggero, Silvia Vicini, Francesca Piqué, Mauro Matteini and Angelita Mairani - <i>A new consolidation protocol with Di-ammonium phosphate for Italian Stones</i>
15h30	4670	<b>Paulina Guzman Garcia Lascurain</b> , Sara Goidanich, Irene de Giuli, Carlos Rodríguez-Navarro and Lucia Toniolo <i>Study of the influence of micro- &amp; nano-cellulose on the growth and carbonation kinetics of portlandite particles</i>
15h45	6147	<b>Andrea Campostroini</b> , Sabrina Manente, Alessandro Di Michele, Elena Ghedini, Michela Signoretto and Federica Menegazzo <i>High-tech multifunctional marmorino plaster with antimicrobial and self-cleaning properties</i>
16h00	6297	Luis Almeida, <b>António Santos Silva</b> , Rosário Veiga and José Mirão <i>Combined application of petrography and SEM-EDS: outputs for accurate identification of binders in hydraulic mortars</i>
16h30		Coffee break
17h00		Poster session 4
18h30		
<b>THURSDAY 11TH   BUILDING C3 - AUDITORIUM 3.2.13</b>		
<b>SESSION A + R - ANALYTICAL METHODS + ROCK ART   CHAIRED BY MÁRCIA VILARIGUES</b>		
09h30	2221	<b>Clarissa Dominici</b> , Chiaramaria Stani, Giovanni Birarda, Francesco Boschin, Lisa Vaccari and Adriana Moroni - <i>Monitoring changes in human activities across the Upper Palaeolithic: a statistical approach for the critical assessment of ancient organic residues through SR-FTIR microscopy</i>
09h45	5178	Daniela Puzio, Alessia Andreotti, Luca Bachechi, Giulia Lorenzetti, <b>Stefano Legnaioli</b> , Simona Raneri and Vincenzo Palleschi - <i>Discovering the rock paintings of the Ethiopian plateau: the Goda Daga Barru and Enda Aba Shillemun shelters</i>
10h00	5751	<b>Laura Rabbachin</b> , Guadalupe Piñar, Irit Nir, Ariel Kushmaro, Mariela Pavan, Elisabeth Eitenberger, Monika Waldherr, Alexandra Graf and Katja Sterflinger - <i>From the desert to the Alps: a study to unveil biodeterioration patterns of historical petroglyphs integrating metagenomics with analytical techniques</i>
10h15	5839	<b>José Tapia</b> , Myriam Eveno, Pablo Arias, Thomas Calligaro, Laurent Pichon, Sebastian Schöder, Katharina Müller and Ina Reiche - <i>Confocal XRF depth profiling combined with XRF mapping to non-destructively understand the stratigraphy of prehistoric cave art</i>
10h30	5922	<b>Victory Jaques</b> and Katarína Holcová - <i>Calcareous nanofossils assemblage in paintings chalk ground for provenance analysis: 3 original paintings compared to European source materials</i>
10h45	5145	Pablo Pérez-Vasallo, David Juanes and <b>Eusebio Solórzano</b> <i>WideXcan: An automated high resolution X-ray radiography system for large artwork pieces</i>
11h00		Coffee break
<b>SESSION E + A - ARCHAEOLOGICAL MATERIALS + ANALYTICAL METHODS   CHAIRED BY MIGUEL ANGEL RESPALDIZA</b>		
11h30	1729	<b>Dorothy Parungao</b> , António Candeias, Joao Lopes and Catarina Miguel <i>Are Infrared and Chemometrics up to the Tusk? On the Use of In-situ Infrared Spectroscopic Techniques for the Study of the Provenance of Historic Ivories</i>
11h45	8045	<b>Laurent Tranchant</b> , Pierre Gueriau, Sebastian Schöder, Serge Cohen, Loïc Bertrand and Mathieu Thoury <i>Detecting visual and chemical modifications induced by the high-flux synchrotron X-ray analysis of ancient teeth</i>
12h00	7832	<b>Enrico Greco</b> , Andrea Maria Gennaro, Daniela Costanzo, Dario Piombino-Mascali, Simona Accardo, Sabina Licen, Pierluigi Barbieri, Sara Signoretti, Caterina Gabriele and Marco Gaspari <i>Dental proteomic analyses reveal the sex of human remains from the Greek cemetery of San Giorgio Extra, Reggio Calabria (Italy)</i>
12h15	4916	<b>Leila Birolo</b> , Georgia Ntasi, Andrea Carpentieri, Manuela Rossi, Schisano Chiara, Chiara Melchiorre, Miriam Alberico, Brunella Cipolletta, Giovanna Scarano and Alessandro Vergara <i>Ancient proteins: from identification to characterization. A review and the case of the funeral equipment in a Hellenistic young woman tomb from Battipaglia</i>
13h00		Lunch break (Building C7)



## SESSION S + A - WOOD + ANALYTICAL METHODS | CHAIRED BY DIEGO TAMBURINI

**15h00** 3189 Costanza Cucci, Juri Agresti, Giovanni Bartolozzi, Francesco Grazzi, Marcello Piccolo, Lorenzo Stefani, Teresa Brancolini, Giulia Basilissi and Anna Consonni - **Technical studies in Egyptology. Multi-modal imaging and multi-range spectroscopies shed light on a rare wooden polychrome chest**

**15h15** 4882 Sveva Longo, Enza Fazio and Silvia Capuani

**Non-destructive identification of wood from XVII Century panel painting using clinical X-ray computed tomography Hounsfield Units scale**

**15h30** 8880 Chiara Ricci, Paola Buscaglia, Debora Angelici, Anna Piccirillo, Federica Pozzi, Paola Manchinu, Leila Es Sebar, Luca Lombardo, Sabrina Grassini, Federico Di Iorio, Sara Croci, Laura Vigo and Davide Quadrio

**Aiding the conservation of two wooden Buddhist sculptures with 3D imaging and spectroscopic techniques**

**15h45** 9209 Eva Hartlieb, Pascal Ziegler, Andreas Baumann, Peter Schöler and Peter Eberhard

**Newly developed transportation frame for a fragile wooden panel painting**

**16h00** 1910 Chiaromaria Stani, Claudia Invernizzi, Giovanni Birarda, Patrizia Davit, Lisa Vaccari, Marco Malagodi, Monica Gulmini and Giacomo Fiocco

**Revealing new secrets behind the Stradivari's craftsmanship: an infrared investigation at the nanoscale.**

**16h30** Coffee break

**17h00** Poster session 4

**18h30** Closing session

## FRIDAY 12TH | AZULEJO NATIONAL MUSEUM

**10H00** VISIT TO MNAZ

**13H00**

## POSTER SESSIONS

MONDAY 8TH   SESSION 1			
N.	Authors	Title	ID
1	Silvia Macedo-Arantes, <u>M. Rosário Martins</u> , António Candeias and A. Teresa Caldeira	<i>Essential Oils/Cyclodextrin Inclusion Complexes as eco friendly antimicrobials for Cultural Heritage: an approach with essential oils of Mentha pulegium and Mentha spicata and Calamintha nepeta from Alentejo (Portugal)</i>	252
2	<u>Alberto Viani</u> , Dita Machová and Petra Mácová	<i>The assessment of state of conservation of bone material in the UNESCO World Heritage site of Sedlec, Czechia.</i>	302
3	<u>Máté Szarka</u> , Ákos Csepregi, Boglárka Dönczö, Zsófia Kertész, Anikó Angyal and Zita Szikszai	<i>Considerations for improved monitoring in ion beam analysis of organic heritage materials</i>	464
4	Forough Armal, Luis Dias, José Mirão, Vera Pires, Fábio Sítzia, Sérgio Martins, Mafalda Costa and <u>Pedro Barrulas</u>	<i>Multi-analytical study and assessment of commercial coating hydrophobic effectiveness and durability in carbonate stones - a case study of built heritage protection and preservation</i>	516
5	<u>Simone Murgia</u> , M. Carla Aragoni, Gianfranco Carcangiu, Veronica Caria, Paola Meloni, Anna Pintus, Enrico Podda and Massimiliano Arca	<i>Protection of carbonate stone samples via treatment with ammonium N-2-picolyloxamate</i>	550
6	<u>Inês Silva</u> , Cátia Salvador, Ana Miller, António Candeias and A. Teresa Caldeira	<i>Microbial induced stone discoloration in Alcaça Monastery: a comprehensive study</i>	595
7	<u>Luisa Vigorelli</u> , Francesca Tansella, Alessandro Re, Laura Guidorzi, Miriana Marabotto, Sabrina Grassini, Gabriele Ricchiardi and Alessandro Lo Giudice	<i>Use of X-Ray imaging techniques for analysis in the Cultural Heritage field</i>	975
8	<u>Anna Fialová</u> , Jan Válek, Petr Kozlovce, Olga Skružná, Jana Maříková-Kubková, Iva Herichová, Dita Frankeová, Alberto Viani	<i>Characterization of mortars from Romanesque floors excavated in St. Bartholomew's church at Prague Castle</i>	1334
9	Anderson de Paula, Alessandra Machado, Olga Maria Araújo, Ricardo Lopes, <u>Davi Oliveira</u>	<i>Portable CT characterization for in situ analysis</i>	1382
10	<u>Aneta Gójska</u> , Ewelina Miśta-Jakubowska, Łukasz Kruszewski, Michał Przędziński, Michał Paczkowski, Leszek Marynowski, Magdalena Wilczopolska, Ryszard Diduszko, K Pyzewicz, Tymoteusz Kosiński, Michał Szubski and Krystian Trela	<i>Thermal transformation of chalcedonite artefacts from the Magdalenian site of Cmielów 95 "Mały Gawroniec" (Poland)</i>	1407
11	Águeda Sáenz-Martínez, <u>Marta Pérez-Estébanez</u> , Mónica Álvarez de Buergo, Margarita San Andrés	<i>Testing acid products thickened with xanthan gum for the removal of calcareous deposits on ceramics</i>	1493
12	<u>Jose F. García</u> , Raul Cabeza-Navarro, Pere Castanyer, Marc Bouzas, Josep Burch, Sònia Sentellas	<i>Identification of wine markers in ancient pottery using liquid chromatography coupled to tandem mass spectrometry (LC-MS/MS)</i>	1764
13	<u>Monica Dinu</u> , Lucian Cristian Ratoiu, Camelia Calin, Gerard Calin	<i>Statistical classification of LIBS and hyperspectral data for mapping the interventions on a historical building</i>	2034
15	Clarisse Chavanne, Laurence de Viguerie, Romain Berraud-Pache, Christelle Souprayan, Sophie Rochut, Brunelle Alain, Philippe Walter, Maguy Jaber, <u>Emeline Pouyet</u>	<i>Operando monitoring of photo-ageing in hybrid material using a Cultural Heritage dedicated platform</i>	2129
16	<u>Idoia Etxebarria</u> , Marco Veneranda, Ilaria Costantini, Nagore Prieto-Taboada, Aitor Larrañaga, Cristina Marieta, Bruno De Nigris, Alberta Martellone, Valeria Amoretti, Gorka Arana, Juan Manuel Madariaga and Kepa Castro	<i>Searching for a new pozzolanic component for the formulation of compatible preservation mortars</i>	2280
17	<u>Graciela Ponce-Antón</u> , Maria Cruz Zuluaga, Giuseppe Cultrone, Luis Angel Ortega, Ricardo Gómez-Val	<i>Multi-analytical characterization of 19-century bricks and plaster from the Church of Sant Rafael (Barcelona, Spain)</i>	2420
18	<u>Giuseppe Capobianco</u> , Daniela Isola, Luca Lanteri, Claudia Pelosi, Silvia Serranti, Oriana Trotta, Giuseppe Bonifazi	<i>Multi-technique approach to evaluate the effect and durability of biocides treatments on Peperino stone in the "Basilica San Francesco alla Rocca" (Viterbo, Italy)</i>	2940
19	<u>Laure Cazals</u> , Lauren Dalecky, Simo Huotari, Alessandro Mirone, Emmanuelle de Clermont-Gallerande, Christoph Sahle, Agnès Desolneux and Loïc Bertrand	<i>Spectral Denoising and Image Segmentation methods for the Processing of Inelastic X-ray Scattering and X-ray Raman Data</i>	3251

20	Patrícia Carvalho, Flávia Leite, Lara Carramate, Sofia Pessanha, Maria Luísa Carvalho, José Paulo Santos, João Veloso and <a href="#">Ana Luísa Silva</a>	<b>Analysis of large area Portuguese Ceramic Samples using a Full-Field EDXRF Imaging System with MPGDs</b>	3470
21	<a href="#">Luis Alves</a> and Victoria Corregidor	<b>Combining Ion Beam Analytical techniques for the characterization of cultural heritage materials</b>	3492
22	<a href="#">Valeria Godoy</a> , Isabel Amaya-Torres, Francisca Márquez and Carmen Royo-Fraguas	<b>Conservation science to rescue the collective memory of the conflict. The case of General Baquedano's public monument at the 18-O Chilean Social Outburst</b>	3541
23	Mustafa Kansiz	<b>Non-contact Submicron O-PTIR and Simultaneous Raman microscopy with Fluorescence imaging - Review of Cultural Heritage Applications</b>	3671
24	<a href="#">Ioana Corțea</a> , Aleksandru Chiroșca and Laurențiu Angheluța	<b>INFRA-ART Spectral Library: A New Open Access Infrastructure for Heritage Science</b>	3952
25	<a href="#">Jorge Sanjurjo Sánchez</a> , Victor Barrientos and Juan Luis Montero Fenollós	<b>Characterisation of Iron Age pottery from the archaeological site of Tell el-Fara (Palestine)</b>	3979
26	Clarimma Sessa, <a href="#">Eva M. Angelin</a> , Nadia Thalgiuter, Simon Mindermann, Randa Deraz, Rebecca Tehrani, Katja Lorenz, Hany Helal, Hector Bagán, Jose F. García, Markus Santner, Christoph Herm, Christoph Krekel, Marcello Picollo, Costanza Cucci, Christian Grosse, Marisa Pamplona, Heike Stege and Thomas Danzl	<b>insiTUMlab: the new analytical infrastructure for non-destructive in-situ studies of Cultural Heritage</b>	4011
27	Dâmăia Carina Dias Do Carmo, Pérside Omena Ribeiro, Selma Otília Gonçalves da Rocha, Alessandra Rosado and Luiz Antônio Cruz Souza	<b>Well preserved rare red glazes in Brazilian Baroque Polychrome Sculptures: Characterization and Conservation</b>	4071
28	Ainhoa Ainhoa Alonso-Olazabal, Iosu Etxezarraga Ortuondo, Luis Angel Ortega, <a href="#">Maria Cruz Zuluaga</a> and Ana Martínez Salcedo	<b>New insights of manufacturing tradition of roof tiles from Basque Country, north of Iberian Peninsula</b>	4083
29	<a href="#">Bilyana Kostova</a> , Boyan Dumanov and Katerina Mihaylova	<b>Archaeological bricks and tiles from Southeast Bulgaria - determination of production technology by methods of archaeological chemistry</b>	4146
30	<a href="#">Marcus Vinicius Oliveira Andrade</a> , Dâmăia Carina Dias Do Carmo, Alessandra Rosado and Luiz Antônio Cruz Souza	<b>GOIA Project - An initiative between the Federal Police and Universities in Brazil against Crimes involving Cultural Property and Works of Art</b>	4375
31	Raysa Nardes, Francis Sanches, Ramon Santos, Hamilton Gama Filho, Eliane Zanatta, Renato Freitas, Roberta Leitão, Catarine Leitão, Davi Oliveira, Ricardo Lopes, Joaquim Assis and <a href="#">Marcelino Anjos</a>	<b>Pigment identification in a 19th century carriage by non-destructive analytical techniques</b>	4549
32	<a href="#">Vera Hubert</a> , Charlotte van de Walle, Erwin Hildbrand, Tiziana Lombardo and Katharina Schmidt-Ott	<b>Evaluation of handheld XRF for the assessment of biocide contamination in cultural heritage objects</b>	4587
33	Suset Barroso-Solares, Elvira Rodríguez-Gutiérrez, Carlos Sanz-Minguez, Javier Pinto and <a href="#">Eusebio Solórzano</a>	<b>X-ray microtomography: unveiling hidden information from historical and cultural heritage</b>	4600
34	Ewa Bulska	<b>Analytical scenario for the investigation of Machu Picchu cultural heritage in Peru</b>	4798
35	Federica Nardella, Alessio Giannaccini, Marco Mattonai, Jacopo La Nasa, Gloriana Pace, Andrea Camilli and Erika Ribechini	<b>Development and optimization of organic residue analysis methods in potsherds from "Cantiere delle Navi Antiche di Pisa"</b>	5018
36	<a href="#">Idoia Etxebarria</a> , Marco Veneranda, Iñaki Vazquez de la Fuente, Ilaria Costantini, Nagore Prieto-Taboada, Giuseppe Di Girolami, Angela Di Lillo, Marina Caso, Rossella Di Lauro, Mario Notomista, Gorka Arana, Juan Manuel Madariaga and Kepa Castro	<b>Selecting a tuff from the Italian active quarries for future restoration works at the Archaeological Park of Herculaneum</b>	5236
37	<a href="#">Dzemila Sero</a> , Frans Pegt, Bodill Lamain, Bieke van der Mark, Isabelle Garachon, Erma Hermens and Kees Joost Batenburg	<b>Analyzing epidermal ridge impressions and tool marks on Rijksmuseum terracotta sculptures</b>	5405
38	<a href="#">Pattria Lertsarawat</a> , Weerawat Pornroongruengchok, Sarinrat Wonglee, Sakchai Laksee, Thitirat Rattanawongwiboon, Kasinee Hemvichian	<b>Characterization and consolidation of wooden artifacts by radiation-assisted curing of HPMA for wood preservation</b>	5594

39	<u>Silvia Pizzimenti</u> , Tomas Markevicius, Alessia Andreotti, Anton Nikiforov, Nina Olsson, Agnieszka Suliga, Gianluca Pastorelli, Nan Yang, Geert Van der Snickt, Klaas Jan van den Berg, Dieuwertje Schrijvers, Jurate Markeviciene, Ilaria Bonaduce	<b>MOXY project: preliminary investigation of a non-contact cleaning of some typical art materials using atomic oxygen</b>	5672
40	<u>Simon Brenner</u> , Hans Clausen, Gerlinde Schneider, Ivana Dobcheva, Wilfried Vetter, Manfred Schreiner, Robert Sablatnig	<b>A Repository for Storage, Linking and Dissemination of Multidisciplinary Manuscript Research Data</b>	5684
41	<u>Federica Nardella</u> , Jacopo La Nasa, Ilaria Degano, Francesca Modugno, Ana-Maria Grui, Ioana Cova, Andrea Beatrice Magó, Márta Guttmann, Erika Ribechini	<b>A multi-analytical approach to disclose the composition of 18th century ointments from the "History of Pharmacy Collection" in Cluj</b>	5803
42	<u>Luminita Ghervase</u> , Monica Dinu, Victoria Atanassova, Ioana Gomoiu	<b>Monitoring the outcome of new biocleaning methods with the help of spectroscopic techniques</b>	5835
43	<u>Gael Latour</u> , Giulia Galante, Maëlle Vilbert, Céline Bonnot-Diconne, Laurianne Robinet and Marie-Claire Schanne-Klein	<b>In situ non-invasive measurement of varnish thickness on historical artefacts by line-field confocal OCT</b>	5991
44	<u>Mihaela-Doina Niculescu</u> , Lucretia Miu, Emanuel Vacalie and Cristina Carsote	<b>Multi-analytical Evaluation of Glues Obtained from Various Types of Hides and Skins</b>	6130
45	Anastasios Asvestas, Emmanouel Kechaoglou, Dimosthenis Chatzipanteliadis, Theofanis Gerodimos, Georgios P. Mastrotheodoros, Konstantina Athanasia Agrafioti, Anastasia Tzima, <u>Mareike Gerken</u> , Roald Tagle, Aristidis Likas, Konstantinos Kosmidis and Dimitrios Anagnostopoulos	<b>MA-XRF AND LIBS INVESTIGATION OF GREEK RELIGIOUS ICONS</b>	6132
46	<u>Maria Cruz Zuluaga</u> , Céline Rémazeilles, Abdelali Oudriss, Egle Conforto, Haizea Portillo, Luis Angel Ortega, Ainhoa Alonso-Olazabal and Juan José Cepeda-Ocampo	<b>A metallurgical study to the understand the manufacturing process of iron nails from the archaeological site of Loiola (Vizcaya, Northern Spain)</b>	6245
47	<u>Vaclav Krupicka</u> , Julie Arslanoglu and Caroline Tokarski	<b>Top-Down MS: the next frontier in MS proteomic analysis of cultural heritage samples?</b>	6275
48	<u>Weronika Machowicz-Musiał</u> , Elżbieta Szmít-Naud, Wojciech Kujawski and Joanna Kujawa	<b>Attempts to use head space gaschromatography to determine solvent retention in easel painting paint layers subjected to conservation treatments</b>	6601
49	Sarinnat Wonglee, <u>Weerawat Pornroongruengchok</u> , Pattrra Lertsarawat, Sutasinnee Kotayee and Piyanut Thongjerm	<b>Preliminary study of irradiation effect on polymer-impregnated wood for cultural heritage preservation using neutron imaging</b>	6803
50	<u>Alberto Viani</u> , Dita Machová, Petra Mácová	<b>Quantitative approach to the conservation of bone collections by means of solid state NMR spectroscopy.</b>	7065
51	Victor Gonzalez, Marine Cotte, <u>Fredrik Vanmeert</u> , Letizia Monaco, Catherine Dejoie, Manfred Burghammer, Wout de Nolf, Loïc Huder, Ida Fazlic	<b>The Heritage "BAG" at the European Synchrotron Radiation Facility: a new collaborative access modality for the structural analysis of historical materials</b>	7198
52	Ana Cristina Hernández Santomé, <u>Jorge Sanjurjo Sánchez</u> , Carlos Alves	<b>Use of hand-held gamma-ray spectrometry to assess decay of granite buildings of a coastal area of NW Spain (Barbanza, Galicia)</b>	7214
53	<u>Luminita Ghervase</u> , Ioana Maria Cortea, Lucian Cristian Ratoiu	<b>New ways of assessing biodeteriogens in cultural heritage</b>	7968
54	Alessandro Re, <u>Miriana Marabotto</u> , Luisa Vigorelli, Andrea Alessio, Laura Guidorzi, Chiara Donazzolo, Alessandro Lo Giudice, Federico Picollo, Marco Truccato	<b>A multi-technique setup based on a liquid anode X-ray source for the non-invasive characterization of materials</b>	7998
56	<u>Jolanda van Iperen</u> , Isabelle Garachon, Margot van Schinkel, Annelies van Hoesel, Neha Verma, Femke Diercks and Katrien Keune	<b>The White Glaze of Delft Blue. Variations in composition in its glory period, from 1625 to 1800.</b>	8237
57	<u>Sveva Longo</u> , Federica Egizi, Valeria Stagno, Maria Giovanna Di Trani, Gianni Marchelletta, Tommaso Gili, Enza Fazio, Gabriele Favero and Silvia Capuani	<b>Magnetic Resonance Imaging clinical scanner for archaeological waterlogged wood investigations</b>	8304
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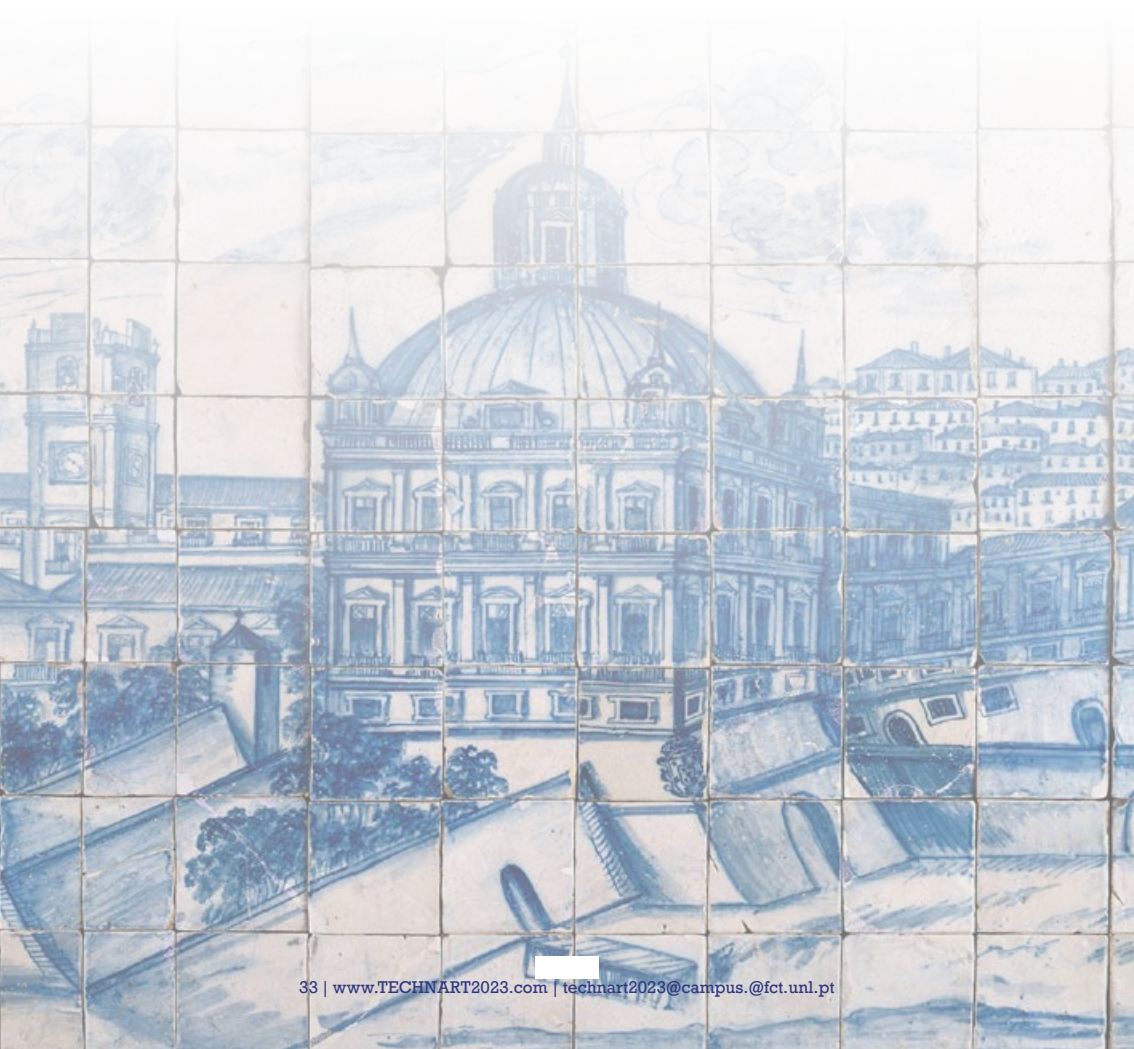


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# ABSTRACTS PLENARY LECTURES



## Development of environmentally-friendly biocidal systems based on chitosan-nanoparticles loaded with R-(+)-pulegone to protect wood from fungal attack

Chiara Genova<sup>(1)</sup>, Marzia Beccaccioli<sup>(2)</sup>, Alessandro Lazzara<sup>(3)</sup>,  
Alessandro Ciccola<sup>(1)</sup>, Simona Sennato<sup>(4)</sup>, Gabriele Favero<sup>(2)</sup> and Alessia Masi<sup>(2)</sup>

(1) Department of Chemistry, Sapienza University of Rome, P.le Aldo Moro 5 - 00185 Rome, Italy

(2) Department of Environmental Biology, Sapienza University of Rome, P.le Aldo Moro 5 - 00185 Rome, Italy

(3) Department of Science, University of Roma Tre, Viale Marconi 446 - 00146 Rome, Italy

(4) Institute for Complex Systems (ISC), National Research Council (CNR), P.le Aldo Moro 5 - Rome, Italy

As society is increasingly aware to environmental issues, research into new sustainable strategies is becoming a central topic in the field of Cultural Heritage conservation. This study is aimed to develop a novel biocidal system for the conservation of wooden artworks, by employing reagents, products and synthesis procedures consistent with Green Chemistry principles. To this aim, R-(+)-pulegone (Pu), which is a natural derivative having assessed biocidal properties against several microorganisms [1], also responsible of biodegradation of wood, was selected to be loaded in chitosan nanoparticles (ChNPs) and applied on wooden sample artificially aged and colonized with *Aspergillus niger*, causing soft-rot on wooden artefacts. Nanoencapsulation was performed with a simple and harmless synthesis method, based on ionic gelation of chitosan, which is a versatile polysaccharide derived from chitin and is attracting attention for its non-toxicity, biocompatibility, biodegradability, biocidal properties as well as its consolidant action, recently studied for the conservation of archeological and waterlogged wood [2]. The inhibition properties and the concentrations of pure chitosan and pulugone against *A. niger* were established *in vitro* through a *Multiwell Assay* (MA) and chitosan nanoparticles loaded with pulugone (ChNPs-Pu) at different Ch:Pu ratios (1:0; 1:0.25; 1:0.5; 1:1) were obtained following experimental procedures described in other studies [3], with some modifications to obtain ChNPs-Pu having suitable characteristics for the application on wooden samples. The morphological characteristics of the NPs and their stability on time were considered and characterized through different analytical methods, included dynamic and dielectrophoretic light scattering (DLS), UV-Visible spectrophotometry, Fourier Transformed Infra-Red (FTIR) spectroscopy and SEM analysis. The biocidal and inhibitory potentials of ChNPs at different R-(+)-pulegone concentrations were evaluated against *A. niger* at different experimental conditions. After the successful results obtained with MA, we are experimenting the spray application of the ChNPs-Pu on wooden samples with variable degree and type of biological colonization. Antimicrobial effect of ChNPs will be evaluated by several methodologies, such as colorimetric assays, measurements *A. niger* colonization and relative vitality.

The valuable achievements obtained suggest that adopting natural compounds represent a promising strategy to preserve the Cultural Heritage from biocolonization.

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