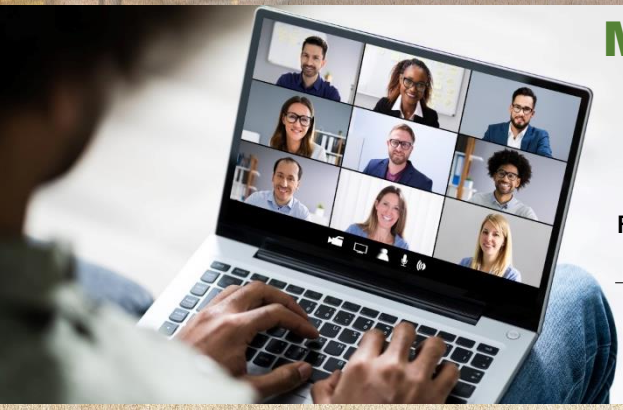
UNIVERSITÀ DI TRENTO

IMEKO TC-4 International Conference on

METROLOGY FOR ARCHAEOLOGY AND CULTURAL HERITAGE

VIRTUAL CONFERENCE - OCTOBER 22, 24, 2020



MetroArchaeo2020

Virtual Conference

For further information, visit the website
www.metroarcheo.com

CONFERENCE PROGRAM

ATHENA SRL
Business and technology consulting

TABLE OF CONTENTS

MetroArchaeo 2020 Committee

GENERAL CO-CHAIRS
Pasquale Daponte, *University of Sannio, Italy*
Stefano Gialanella, *University of Trento, Italy*
Dario Petri, *University of Trento, Italy*

TECHNICAL PROGRAMME CO-CHAIRS
Michele Fedel, *University of Trento, Italy*
Annaluisa Pedrotti, *University of Trento, Italy*
Fabio Santaniello, *University of Trento, Italy*
Marco Zanatta, *University of Trento, Italy*

INTERNATIONAL PROGRAM COMMITTEE
Emma Angelini, *Politecnico di Torino, Italy*
Fabrizio Antonelli, *LAMA - LabCoMaC - Iuav University of Venice, Italy*
Lucio Calcagnile, *University of Salento, Italy*
Franco Cambi, *University of Siena, Italy*
Stefano Campana, *University of Siena, Italy*
Piergiulio Cappelletti, *University of Naples, Italy*
Luca Cappuccini, *University of Florence, Italy*
Paolo Carafa, *University of Roma La Sapienza, Italy*
Lorenzo Ciani, *University of Florence, Italy*
Juan Antonio Quirós Castillo, *Universidad del Pais Vasco, Spain*
Andrea Cataldo, *University of Salento, Italy*
Cristina Corsi, *University of Cassino and Southern Lazio, Italy*
Giuseppe Cultrone, *University of Granada, Spain*
Egidio De Benedetto, *University of Salento, Italy*
Lucio Del Corso, *University of Cassino and Southern Lazio, Italy*
Zaccaria Del Prete, *Sapienza University of Rome, Italy*
Maria Grazia D'Urso, *University of Bergamo, Italy*
Francesco Fontanella, *University of Cassino and Southern Lazio, Italy*
Venice Gouda, *National Research Centre, Egypt*
Sabrina Grassini, *Politecnico di Torino, Italy*
Francesco Lamonaca, *University of Sannio, Italy*
Marco Laracca, *University of Cassino and Southern Lazio, Italy*
Giovanni Leucci, *Istituto di Scienze del Patrimonio Culturale (ISPC-CNR), Italy*
Paolo Liverani, *University of Florence, Italy*
Carmine Lubritto, *Università degli Studi della Campania "Luigi Vanvitelli", Italy*

MetroArchaeo 2020 Plenary Speakers

Thursday, October 22, 2020 - 10.00 CET

Early Pyrotechnology: Lithic Heat Treatment

Patrick Schmidt
University of Tübingen, Germany

ABSTRACT
Heat treatment of silica rocks chert and silcrete is one of the oldest transformative technologies used to alter the properties of materials. Its first use dates back to the southern African Middle Stone Age (MSA), and several examples are known from the Asian and European Upper Palaeolithic and Australia. The research questions associated with heat treatment are related to its purpose for tool manufacture, the investment in time and resources needed for it or the social and cognitive capacities it requires. Intensive research on these questions has been conducted for almost ten years now. In this presentation I will summarise the most recent progresses and discuss the methodological developments.

SPEAKER BIOGRAPHY
Patrick Schmidt works at the interface of prehistoric archaeology and mineralogy. Research topics are the spectroscopic signature of minerals, the properties of archaeo-materials, mineralogy and crystallography of raw materials, provenance studies and stone heat treatment. His main focus lies on silica minerals like quartz, opal-CT and moganite, and siliceous rocks like flint, chert and silcrete.

Friday, October 23, 2020 - 09:30 CET

In-situ differentiation of black rock paintings in the palaeolithic caves

Ina Reiche
Research director at PCMTH team, Institut de recherche de Chimie Paris (IRCP)
Centre de recherche et de restauration des musées de France (C2RMF)

ABSTRACT
Prehistoric cave art represents a key marker for a better understanding of the evolution of mankind. Interdisciplinary approaches using methods from archaeology, geology, biology, chemistry and physics have addressed many questions about the environment of these archaeological sites, the dating and the material nature of the decorated walls. The combination of these results allowed the field to reach conclusions about the cultural and technical practices and improved our knowledge of our distant ancestors. However, cave art still remains mysterious, despite the fact that it has been the subject of many interpretations.
Physico-chemical analyses of the painted works have also been applied for thirty years to the archaeological parietal representations, such as those found in prehistoric caves. The analysis of the constituting materials of these drawings and paintings (nanosized iron oxides for the reds and yellows, nanocrystalline manganese oxides and charcoal for the blacks) ultimately reveals characteristics that provide insight into the artistic techniques and cultural practices of prehistoric humans. Analysing cultural materials also gives information on alteration processes. The knowledge acquired this way is valuable, as it provides original information that is impossible to obtain by another means.
The availability of new and advanced physicochemical techniques allowed for a renewal of the research on cave paintings. The research started with analyses carried out on samples from the paints, archaeological artefacts and raw material. They showed the existence of precise recipes of "paint pots" consisting of pigments, extender and binder. In some cases, the results allowed for an analysis of the creation sequence of the prehistoric figures. In other cases, the pigments were differentiated depending on characteristics related to their geological origin (trace elements).
Elementary analyses are used to answer questions such as the differentiation of parietal representations presenting the same mineralogical phase, the origin of raw materials, or the determination of the sequence of production.
The fragile nature of cave art has been known since its discovery. Strict conservation procedures have been applied to protect these UNESCO world heritage listed paintings. The awareness of the fragility of important cultural artefacts has led to a rapid transition from destructive studies to micro-sampling and then finally to non-invasive analyses, carried out in situ. Thus, portable X-ray diffraction, Raman spectroscopy and XRF have been used for the characterization of the paint layers directly. However, portable technologies are still not as efficient as their lab-based counterparts. Their sensitivity and precision frequently lower than the methods available in the lab. Additionally, the differentiation of the compounds in the pigments from those in the wall is difficult because the colouring matter analysed on the cave walls is not geometrically regular nor chemically homogeneous, both laterally and in depth. Taphonomical phenomena may also contribute to the heterogeneity of the chemical composition of the

paint layer and the wall substrate. Encouraging results have however been obtained in several studies, due to an active methodological research on these techniques.
In particular, p-XRF enables determining the geochemical signature of colouring matter, helping to answer archaeological questions without altering the work under study. For black pictorial layers based on manganese oxides, it was possible to develop a semi-quantitative analytical protocol that allowed the differentiation of black prehistoric figures in the case of the Rouffignac and Font-de-Gaume caves in Dordogne, France. This is all the more important in the absence of a direct dating of the figures made with three types of manganese oxides as it is the case at the Rouffignac cave. The research is carried out thanks to the combination of non-invasive chemical analyzes using X-ray fluorescence in situ as well as the stylistic study and that of the overlays of the figures. In the absence of a general organization of the panel of the Grand Ceiling of the Rouffignac cave it was possible to show that all of the figures were produced in stages in small subsets by small groups of humans. This is consistent with the creation of the friezes, in particular that of the ten mammoths present in other galleries of this cave by a small group of prehistoric artists.

SPEAKER BIOGRAPHY

Ina Reiche: research director at PCMTH team, Institut de recherche de Chimie Paris (IRCP) - Centre de recherche et de restauration des musées de France (C2RMF) - UMR 8247 CNRS

- Degree in Chemistry and bachelor in Art history: 1997;
- PhD in Material Science: 2000;
- Researcher at the Rathgen research laboratory, National Museums in Berlin, Prussian Cultural Heritage Foundation: 2000-02;
- Researcher at French National Research Council (CNRS) from 2003;
- Habilitation in Analytical Chemistry: 2009;
- CNRS research director since 2012;
- Head of the Rathgen research laboratory (on leave from CNRS): 2014-19;
- Research fields: Archaeometry of historical and archaeological biominerals (bone, ivory, antler, corals) as well as pigments, glass and minerals. Identification and understanding of alteration processes by using analytical methods such as synchrotron methods, ion beam analysis and other laboratory and mobile equipment, especially Raman and X-ray fluorescence analysis.
- Recent studies: depth resolved chemical analysis and imaging of easel paintings; analysis of the late use of smalt in paintings; PIXE analysis of early Egyptian glass from Amarna; in situ identification of prehistoric pigments in Palaeolithic caves (Rouffignac and Font-de-Gaume, Dordogne); non-invasive ion beam analysis of Palaeolithic mammoth ivory artefacts and their origin.

Friday, October 23, 2020 - 14:30 CET

What's next in past landscapes studies? Drone-based platform a killer application in archaeological survey

Stefano Campana
Università degli Studi di Siena, Italy

ABSTRACT
In the last decade new and progressively more sophisticated aerial platforms – UAVs or drones – have become widely available for archaeological applications traditionally carried out through the use of balloons, kites or light aircraft. More recently archaeologists have been testing both the drones and their sensors for the 3D recording of excavations, monuments and historic buildings as well as for the survey of whole archaeological sites and their landscape contexts. The scale and market expansion of these platforms has been driving the rapid development of both active and passive sensors specifically designed for UAVs.
Today, drones are becoming more and more versatile through the creation of multiple devices that can undertake activities traditionally treated as either airborne (LiDAR) or ground-based (geophysical prospection). Drones are now available for 3D data capture in exploratory air photography and landscape survey, capable, with the aid of semi-automation and AI, of identifying and documenting surface scatters of archaeological material. High-resolution LiDAR survey, multispectral imaging and geophysical prospection by both radar and magnetometry can now be successfully undertaken through the use of drones – a real 'life-giver' in terms of archaeological technique. These advances promise to revolutionize the practice of archaeological survey as a whole.

SPEAKER BIOGRAPHY

Stefano Campana has been working for the past fifteen years at the University of Siena (Italy) and the University of Cambridge (UK). He is specializing in landscape archaeology, remote sensing and archaeological methodology for purposes of research, recording and conservation. His work is focused on the understanding of past landscapes from prehistory to the current age. The principal cultural context for his work has been Tuscany but he has also participated in and led research work in the UK, Spain, Turkey, Palestine, Iraq and Asia. Since 2006 he has been a faculty member of the University of Siena (Italy), in the Department of History and Cultural Heritage, where he has engaged in teaching and research as associate professor in Landscape Archaeology. From 2016 he has also been invited from the Department of Social, Political and Cognitive Sciences of the University of Siena to teach "Cultural Diplomacy and Archaeology" within the international master course in Cultural Diplomacy. From September 2014 to June 2016 he became Senior Research Fellow at the University of Cambridge (UK), Faculty of Classics.
He has established a sound reputation as an international authority in the field of landscape and digital archaeology. He promoted concepts such as 'emptyscapes' and the 'archaeological continuum' within

rural studies and he have demonstrated their relevance to theoretical and practical approaches within Mediterranean archaeology, notably through the systematic application of large-scale geophysical survey, aerial exploration and air photography, including the use of drones and drone-based lidar.
In 2011 he was proposed and admitted as a Fellow of the Society of Antiquaries of London (FSA) and in 2012 he was invited to be a member of the General Management Board of HIST, the Governing Board of the International Centre on Space Technologies for Natural and Cultural Heritage, under the auspices of UNESCO and the Chinese Academy of Sciences. He was invited as visiting professor in 2014 at University of Lund, Department of Archaeology (Sweden), in 2016 at École Normale Supérieure (Paris), in 2017 at the Institute of Archaeology of Erbil (Erbil-Iraq) and in 20202 at the University of Bucharest, Faculty of History.

Saturday, October 24, 2020 - 09:20 CET

Long-distance timber trading in the Roman Empire

Mauro Bernabei
National Research Council of Italy - Institute of BioEconomy (IBE), Italy

ABSTRACT

Throughout antiquity wood was the most important raw material and energy source. In contrast to other archaeological finds e.g. pottery, stone tools and metal, the in general poor preservation conditions for organic material make archaeological records of wood very rare. It is preserved over a long period of time only in very humid or very dry locations. Hence archaeological wooden remains are of particular interest for research: they provide insight into former environmental conditions, wood technology and ancient economic history. In addition yield annually resolved dendrochronological data that allows precise dating of archaeological features. During an archaeological excavation in the center of Rome 24 oak (Quercus sp.) planks were found as part of the foundation of a richly decorated portico, in a vast and wealthy property. Due to waterlogged conditions wood was remarkably well-preserved and the processing traces are still clearly visible. Most of the material belongs to a single lot of timber and shows no signs of reuse. Dendrochronological analyses were performed in order to date the structure. Further researches regarding the wood provenance were possible through statistical cross-dating. Our results demonstrated that the oak trees had been felled between 40 and 60 CE in the Jura Mountains of north-eastern France. It is most likely that the wood was transported to the Eternal City on the Saône and Rhône rivers and then across the Mediterranean Sea. This rare dendrochronological evidence from the capital of the Roman Empire gives fresh impetus to the ongoing debate on the likelihood of transporting timber over long distances within and between Roman provinces. This study reconstructs the administrative and logistic efforts required to transport high-quality construction timber from central Europe to Rome. It also highlights an advanced network of trade, and emphasises the enormous value of oak wood in Roman times.

SPEAKER BIOGRAPHY

- Degree in Forestry: 1993
- PhD in Wood Science: 1997
- Researcher at the National Research Council – Institute of BioEconomy (CNR-IBE) from 1998
- Head of the Laboratory of Dendrochronology of the CNR-IBE
- Research fields: wood science and all the aspects related to wood dating, conservation, species identification in archaeology, art history and cultural heritage.
- Recent studies: wood from Pompeii; olive trees from the Gethsemane garden in Jerusalem; the roof of the Basilica of Nativity in Bethlehem; the foundations of the Rialto Bridge in Venice; the Cherubini Collection musical instruments; the timber from historical buildings in Florence (Giotto's Bell Tower, Basilica of Santa Croce, Baptistry).

MetroArchaeo 2020 Tutorials

Thursday, October 22, 2020 - 17.40 CET

Measuring the sound: metrology of historical bow stringed instruments

Franco Zanini
Elettra - Sincrotrone Trieste, Italy

ABSTRACT

In the past years X-ray computed tomography (CT) has successfully entered the field of applied metrology because it offers several advantages with respect to traditional coordinate measuring systems at the micro scale: non-destructive inspection of internal geometrical features, verification of parts in assembled state, simultaneous dimensional quality control and material quality control, and reconstruction of complete and high-density pointclouds in relatively short time. As exhaustively described in literature, this non-destructive dimensional measuring technique is based on the acquisition of multiple X-ray projections taken from different angular positions and allows a holistic three-dimensional reconstruction of the geometry of the measured object. The use of synchrotron radiation (SR) as a source of X-rays, adds additional advantages to the technique. SR facilities produce high-flux, monochromatic, highly collimated X-ray beams with high brightness, allowing reduced exposition times and a more efficient data analysis. The energy of the emitted beams can also be tuned in a way that contributes to the optimization of the signal-to-noise ratio as a function of the sample composition, shape and size.

A common application of SR-CT metrology applied to the field of cultural heritage is the analysis of historical violins in order to produce high-quality replicas. SYRMEP, the X-ray imaging beamline at Elettra, has been working routinely on the CT structural analysis of ancient bow stringed instruments during the last decade, and some related results will be shown.

Friday, October 23, 2020 - 17.40 CET

Digital Replica Of An Ancient Artefact

Paolo Bosetti
University of Trento, Italy

Ciro Malacarne
ProM Facility, Italy

ABSTRACT

The advent of digital manufacturing can prove a powerful tool for Archaeologists: from 3-D scanning technologies to additive manufacturing, it is now possible to create one (or more) precise replica of an artefact or - by exploiting reverse engineering techniques - to create lost parts of an existing artifact that perfectly match fracture surfaces, in a matter of minutes.

The 3-D digital models are also a valid tool per se: easy to share and safely study/explore, even with tools and approaches taken from industrial dimensional metrology.

TOOLS AND DEVICES

The demo is presented from the laboratories of ProM Facility (http://promfacility.eu), a prototyping facility co-operated by the University of Trento.

Among the rest, the facility has significant equipment for additive manufacturing and reverse engineering. For this demo, we are proposing the usage of relatively lowcost devices and systems, which yet allow to obtain high quality results.

In particular, we are going to show the usage of:

SLA 3-D printer

Software for dealing with triangulated surface models

Software for basic metrology analysis

Software for print job preparation

TASKS

The demo follows a schedule that goes from the description of setup to the final result:

In particular, we are going to show the usage of:

1. Description of devices and tools needed for making the replica;
2. 3D scan of the artefact with a structured light scanner;
3. Digital model: resolution, reconstruction of triangulated model from point cloud, model cleanup, watertightness, consistency of surface normals, dimensional verifications, dimensional metrology, boolean operations;
4. Setup of digital model for SLA additive manufacturing;
5. Choice of available materials for SLA;
6. SLA process setup, printer preparation, and print process;
7. Finishing of the replica.

Saturday, October 24, 2020 - 12.20 CET

Evidence of thermal processing of iron-rich materials during Prehistory

Giovanni Cavallo
Institute of Materials and Constructions
University of Applied Sciences and Arts of Southern Switzerland - SUPSI, Switzerland

ABSTRACT

The intentional use of fire by the first human beings is a topic still debated. The general agreement is that the use of fire has been one of the most prominent development during Prehistory (Aldeias et al., 2012, p. 2414). In this regard, the pyro-technological transformation of the yellow goethite into red hematite was common, intentional (Salomon et al., 2015, p. 109), and consolidated practice in Prehistoric archaeological contexts. Mineralogical structural analyses using X-ray Powder Diffraction (XRPD) and Transmission Electron Microscopy (TEM) have been successfully used for studying artificial hematite and for the estimation of the relevant transformation temperature (Cavallo et al., 2018, p. 1058). This protocol was developed in collaboration with the Dept. of Industrial Engineering of the University of Trento (Italy). This is possible thanks to the selective peak broadening of (proto)-hematite in diffraction profiles, and characteristic size and morphology of the pores consequent to water loss in TEM images of synthetic goethite (Pomiès et al., 1999, p. 284-285).

Experimental thermal treatments, over a temperature range of 250 up to 1000 °C, have been carried out on natural goethite with the scope to compare the effects of heat treatment on natural goethite with (heated) synthetic goethite, also for reviewing the temperature values reported in archaeological ochre samples (Cavallo et al., 2018, p. 1058).

The mineralogical analysis demonstrated that selective broadening of some diffraction peaks occurs during the transformation for temperatures between 200-600 °C, in accordance with experiments conducted on synthetic goethite samples (Pomiès et al., 1999, p. 284-285)The TEM analyses confirmed the crystallographic data obtained from XRD and at the same time provided a complete insight into the microstructural features brought about by the thermal treatments conducted on goethite. In particular, it was observed that small and well-aligned pores form in the temperature range 200-400 °C whilst at temperature of 600 °C the morphology of the pores, their distribution and the size change significantly. At 800 °C this change is more marked, and at 1000 °C the recrystallization process is complete. The combination of XRPD and TEM analysis represents a valid analytical methodology for evidencing heat treatment of goethite mineral pigment and temperatures reached during the thermal process.

Technical Sessions - Thursday, October 22

09:30 - 10:00 CET
OPENING CEREMONY
Room: *Virtual Room #1*

Flavio Deflorian - *Deputy Rector - University of Trento*

Pasquale Daponte - *Chairman IMEKO & MetroArchaeo2020*

Dario Petri - *Head of the Dept. of Industrial Engineering - University of Trento & Chairman MetroArchaeo2020*

Stefano Gialanella - *University of Trento & Chairman MetroArchaeo2020*

10:00 - 10:50 CET
PLENARY SESSION
Room: *Virtual Room #1*
Chair: *Fabio Santaniello, University of Trento, Italy*

Early Pyrotechnology: Lithic Heat Treatment

Patrick Schmidt
Department of Early Prehistory and Quaternary Ecology
Department of Geosciences, Applied Mineralogy
University of Tübingen, Germany

11:00 - 12:40 CET
SESSION 1.1 – SPECIAL SESSION ON MULTISCALE AND MULTITEMPORAL HIGH RESOLUTION REMOTE SENSING AND NON-DESTRUCTIVE TESTING FOR ARCHAEOLOGY AND MONUMENTAL HERITAGE: FROM RESEARCH TO PRESERVATION - PART 1
Room: *Virtual Room #1*
Chairs: Giovanni Leucci, *ISPC - CNR, Italy*
Nicola Masini, *ISPC - CNR, Italy*
Salvatore Piro, *ISPC - CNR, Italy*

11:00 Integrated use of GPR and TDR for wood permittivity evaluation
Filippo Comisi, University of Catania, Italy
Lara De Giorgi, Institute of Cultural Heritage Sciences, CNR, Italy
Giovanni Leucci, Institute of Cultural Heritage Sciences, CNR, Italy

11:20 From causes to effects. Integration of heterogeneous data from non invasive imaging for the diagnosis and restoration of monuments. The case of the Church of S. Francesco della Scarpa in Lecce (Southern Italy)
Giovanni Leucci, Institute of Cultural Heritage Sciences, CNR, Italy
Francesco Gabellone, Nanotec CNR, Lecce, Italy
Fabrizio Terenzio Gizzi, Institute of Cultural Heritage Sciences, CNR, Italy
Nicola Masini, Institute of Cultural Heritage Sciences, CNR, Italy

11:40 A multiscalar research project, following an ancient decumanus in Montenegro
Lucia Alberti, National Research Council of Italy, Italy
Francesca Colosi, National Research Council of Italy, Italy
Pasquale Merola, National Research Council of Italy, Italy

12:00 Warscapes: A "Submerged Information Basin". The Contribution of LiDaR Data to the Unveiling
Joel Aldrighettoni, University of Trento, Italy
Alessandra Quendolo, University of Trento, Italy

12:20 Acoustic remote sensing for seabed archaeology
Crescenzo Violante, CNR, Italy

11:00 - 13:00 CET
SESSION 2.1 - SPECIAL SESSION ON GEOMATERIALS FOR CULTURAL HERITAGE - PART 1
Room: *Virtual Room #2*
Chairs: Marco Lezzerini, *University of Pisa, Italy*
Stefano Pagnotta, *University of Pisa, Italy*

11:00 Evaluating the Effects of High Tide on Venetian Stone Buildings: A Multi Analytical Approach
Gloria Zaccariello, Iuav University of Venice, Italy
Elena Tesser, Iuav University of Venice, Italy
Rebecca Piovesan, Iuav University of Venice, Italy
Fabrizio Antonelli, Iuav University of Venice, Italy

11:20 Petro-archaeometric characterization of historical mortars in the city of Ravenna (Italy)
Elena Marrocchino, University of Ferrara, Italy
Chiara Telloli, ENEA, Italy
Paola Novara, National Museum of Ravenna, Italy
Carmela Vaccaro, University of Ferrara, Italy

11:40 Thermal decay of monzogranite from Elba Island (western Tuscany, Italy): properties of an ancient building material
Andrea Aquino, University of Pisa, Italy
Michele Antola, University of Pisa, Italy
Alessio Pacchini, University of Pisa, Italy
Stefano Pagnotta, University of Pisa, Italy
Marco Lezzerini, University of Pisa, Italy

12:00 Macigno sandstone from Garfagnana and Vellano (north-western Tuscany): chemical, mineralogical, petrographic and physical characterization of a building material
Andrea Aquino, University of Pisa, Italy
Claudio Di Petta, University of Pisa, Italy
Stefano Pagnotta, University of Pisa, Italy
Marco Tamponi, University of Pisa, Italy
Marco Lezzerini, University of Pisa, Italy

12:20 Macigno sandstone from Monti d'Oltre Serchio: chemical, mineralogical, petrographic and physical characterization of a building material
Andrea Aquino, University of Pisa, Italy
Paolo Baglini, University of Pisa, Italy
Stefano Pagnotta, University of Pisa, Italy
Marco Tamponi, University of Pisa, Italy
Marco Lezzerini, University of Pisa, Italy

12:40 Geopolymer mortar: metakaolin-based recipe for Cultural Heritage Application
Stefano Pagnotta, University of Pisa, Italy
Anna Lluveras Tenorio, University of Pisa, Italy
Maria Rosaria Tinè, University of Pisa, Italy
Marco Lezzerini, University of Pisa, Italy

11:00 - 13:00 CET
SESSION 3.1 - SPECIAL SESSION ON INTEGRATED DIGITAL SURVEY METHODOLOGIES FOR THE KNOWLEDGE AND ENHANCEMENT OF ARCHITECTURAL AND URBAN HERITAGE- PART 1
Room: *Virtual Room #3*
Chairs: Marco Giorgio Bevilacqua, *University of Pisa, Italy*
Assunta Pelliccio, *University of Cassino and Southern Latium, Italy*

11:00 Rome: NE slopes of the Palatine hill. Analysis and quantification of ancient architectures
Emanuele Brienza, Università degli Studi di Enna Kore, Italy
Lorenzo Fornaciari, Università degli Studi di Salerno, Italy

11:20 Archives enhancement through design drawings survey, BIM modeling and prototyping
Giulia Bertola, Politecnico di Torino, Italy

11:40 Baroque banded vaults with independent arches: from literature to realizations in Turin atria
Fabrizio Natta, Politecnico di Torino, Italy

12:00 3D modelling trough planar slides, from digital to physical. Experiments on Palazzo Mazzonis'atrium in Turin
Francesca Ronco, Politecnico di Torino, Italy

12:20 Archaeology of buildings and HBIM methodology: integrated tools for documentation and knowledge management of architectural heritage
Ilaria Trizio, Italian National Research Council, Italy
Francesca Savini, Italian National Research Council, Italy

12:40 Experiences of industrial archaeology in I taly: from survey to museum use
Francesco Gabellone, National Research Council, Italy

13:30 - 14:30 CET
POSTER SESSION 1
Room: *Virtual Poster Room*

PS 1.1 The old scientific-technological instrumentations in the Museo dell' Arte della Lana of Stia
Emma Angelini, Politecnico di Torino, Italy
Andrea Gori, Museo dell'Arte della Lana, Italy

PS 1.2 Mineralogical and chemical characterization of surfa ce orange layers on the limestone of the Monastery of Batalha, Central Portugal
Yufan Ding, University of Évora, Portugal, Polytechnic of Turin, Italy
Pedro Redol, Mosteiro da Batalha, Portugal
Emma Angelini, Polytechnic of Turin, Italy
José Mirão, University of Évora, Portugal
Nicola Schiavon, University of Évora, Portugal

PS 1.3 Overview of structural health monitoring systems for the foundations of historic buildings
Matilde Zarrella, University of Sannio, Italy
Carmelo Scuro, University of Calabria, Italy
Domenico L. Carnì, University of Calabria, Italy
Renato S. Olivito, University of Calabria, Italy
Francesco Lamonaca, University of Sannio, Italy

PS 1.4 Artificial Intelligence based monitoring system for historical building preservation
Domenico Luca Carnì, University of Calabria, Italy
Carmelo Scuro, University of Calabria, Italy
Renato Sante Olivito, University of Calabria, Italy
Maria Caterina Crocco, University of Calabria, Italy
Francesco Lamonaca, University of Sannio, Italy

PS 1.5 Full scale Dynamic Tests on Unreinforced and GFRCM reinforced Apulian Tuff Masonry Arches
Anna Castellano, Polytechnic University of Bari, Italy
Aguinaldo Fraddosio, Polytechnic University of Bari, Italy
Jacopo Scacco, Politecnico di Milano, Italy
Gabriele Milani, Politecnico di Milano, Italy
Mario Daniele Piccioni, Polytechnic University of Bari, Italy

PS 1.6 Dynamic Identification of the Damage for a Parabolic Tuff Barrel Vault with Differential Settlements of the Supports
Anna Castellano, Polytechnic University of Bari, Italy
Aguinaldo Fraddosio, Polytechnic University of Bari, Italy
Jacopo Scacco, Politecnico di Milano, Italy
Gabriele Milani, Politecnico di Milano, Italy
Mario Daniele Piccioni, Polytechnic University of Bari, Italy

PS 1.7 GPR prospecting for the search of St .Canio's lost bones (Acerenza, southern Italy)
Lara De Giorgi, CNR ISPC, Italy
Giovanni Leucci, CNR ISPC, Italy
Maurizio Lazzari, CNR ISPC, Italy
Raffaele Persico, Universitá della Calabria, Italy

PS 1.8 A new methodological approach on the evaluation of stability of cavities in "soft" carbonate rocks.
Lara De Giorgi, CNR ISPC, Italy
Giovanni Leucci, CNR ISPC, Italy

PS 1.9 3D GPR and ERT surveys at the coastal tower of S. Caterina (Lecce, Italy)
Lara De Giorgi, Institute of Cultural Heritage Sciences, Italy

Giancarlo De Pascalis, Universitá di Roma La Sapienza, Italy
Ivan Ferrari, Institute of Cultural Heritage Sciences, Italy
Francesco Giuri, Institute of Cultural Heritage Sciences, Italy
Giovanni Leucci, Institute of Cultural Heritage Sciences, Italy

PS 1.10 Geophysical surveys at the archaeological site of anglona (mt)
Lara De Giorgi, CNR ISPC, Italy
Dimitris Roubis, CNR, Italy
Giovanni Leucci, CNR ISPC, Italy

PS 1.11 Geometric survey and characterization of artifacts through portable devices: an experience of mobile laboratory inside the Aeolian Museum of Lipari
Dario Giuffrida, CNR-IPCF, Italy
Viviana Mollica Nardo, CNR-IPCF, Italy
Oreste Adinolfi, FARO Europe GmbH & Co., Germany
Maria Amalia Mastelloni, Parco Archeologico e Museo "L. Bernabò Brea", Italy
Rosina Celeste Ponterio, CNR-IPCF, Italy

PS 1.12 A database for historical pigments through handheld instrumentation
Giulia Festa, Centro Fermi, Italy
Claudia Scatigno, Centro Fermi, Italy
Maria Luisa Saladino, Università di Palermo, Italy
Francesco Armetta, Università di Palermo, Italy
Veronica Ciaramitaro, Università di Palermo, Italy
Viviana Mollica Nardo, CNR-IPCF, Italy
Rosina Celeste Ponterio, CNR-IPCF, Italy

14:30 - 16:10 CET
SESSION 1.2 – SPECIAL SESSION ON MULTISCALE AND MULTITEMPORAL HIGH RESOLUTION REMOTE SENSING AND NON-DESTRUCTIVE TESTING FOR ARCHAEOLOGY AND MONUMENTAL HERITAGE: FROM RESEARCH TO PRESERVATION - PART 2
Room: *Virtual Room #1*
Chairs: Giovanni Leucci, *ISPC - CNR, Italy*
Nicola Masini, *ISPC - CNR, Italy*
Salvatore Piro, *ISPC - CNR, Italy*

14:30 Combined migration results in GPR prospecting
Raffaele Persico, University of Calabria, Italy
Gianfranco Morelli, Geostudi Astier Ltd, Italy

14:50 Spatial analysis and Lidar data for the extraction of archaeological features : the Etruscan site of San Giovenale, Blera (Lazio)
Maria Danese, CNR-ISPC, Italy
Rosa Lasaponara, CNR IMAA, Italy
Nicola Masini, CNR-ISPC, Italy

15:10 Multimethodological Geophysical Investigations to study the Archaeological Site of Norba (Norma, Central Italy)
Salvatore Piro, ISPC CNR, Italy
Stefania Quilici Gigli, Università della Campania Luigi Vanvitelli, Italy
Enrico Papale, ISPC CNR, Italy
Daniela Zamuner, ISPC CNR, Italy

15:30 Point clouds registration based on constant radius features for large and detailed cultural heritage objects
Luca Di Angelo, University of L'Aquila, Italy
Paolo Di Stefano, University of L'Aquila, Italy
Anna Eva Morabito, University of Salento, Italy
E. Guardiani, University of L'Aquila, Italy

15:50 Analysing the thermal conditions of historic buildings in Cyprus using archive Landsat satellite data and Google Earth Engine big data cloud platform
Athos Agapiou, Cyprus University of Technology, Eratosthenes Centre of Excellence, Cyprus
Vasiliki Lysandrou, Cyprus University of Technology, Eratosthenes Centre of Excellence, Cyprus
Diofantos Hadjimitsis, Cyprus University of Technology, Eratosthenes Centre of Excellence, Cyprus

14:30 - 16:10 CET
SESSION 2.2 - SPECIAL SESSION ON GEOMATERIALS FOR CULTURAL HERITAGE - PART 1
Room: *Virtual Room #2*
Chairs: Marco Lezzerini, *University of Pisa, Italy*
Stefano Pagnotta, *University of Pisa, Italy*

14:30 The local black limestones used to make the typical black and white alternation of the Pisa's Romanesque Style
Marco Lezzerini, University of Pisa, Italy
Stefano Pagnotta, University of Pisa, Italy
Andrea Aquino, University of Pisa, Italy
Marcello Spampinato, University of Pisa, Italy

14:50 The role of 3D modelling for different stone objects: from mineral to artefact
Andrea Aquino, University of Pisa, Italy
Stefano Pagnotta, University of Pisa, Italy
Elena Pecchioni, University of Florence, Italy
Vanni Moggi Cecchi, University of Florence, Italy
Stefano Columbu, University of Cagliari, Italy
Marco Lezzerini, University of Florence, Italy

15:10 Workability and chemical physical degradation of limestone frequently used in historical Mediterranean architecture
Stefano Columbu, University of Cagliari, Italy
Paola Meloni, University of Cagliari, Italy
Gianfranco Carcangiu, CNR, Istituto di Scienze dell'atmosfera e del Clima, Italy
Dario Fancello, University of Cagliari, Italy

15:30 Ca-oxalate films on the stones of the medieval architecture: the case study of Romanesque Churches
Stefano Columbu, University of Cagliari, Italy
Marco Giamello, University of Siena, Italy
Stefano Pagnotta, University of Pisa, Italy
Andrea Aquino, University of Pisa, Italy
Marco Lezzerini, University of Pisa, Italy

15:50 Cognitive methodology and diagnostic plan for cultural heritage conservation
Caterina Gattuso, University of Calabria, Italy

14:30 - 16:10 CET
SESSION 3.2 - SPECIAL SESSION ON INTEGRATED DIGITAL SURVEY METHODOLOGIES FOR THE KNOWLEDGE AND ENHANCEMENT OF ARCHITECTURAL AND URBAN HERITAGE- PART 2
Room: *Virtual Room #3*
Chairs: Marco Giorgio Bevilacqua, *University of Pisa, Italy*
Assunta Pelliccio, *University of Cassino and Southern Latium, Italy*

14:30 Integrated digital survey for the knowledge and enhancement of the IIWW heritage. The Natural Park Molentargius-Saline (Cagliari, Italy)
Andrea Pirinu, University of Cagliari, Italy
Andrés Martínez-Medina, University of Alicante, Spain
Nicola Paba, University of Cagliari, Italy

14:50 High performance laser survey and 3D stress analysis for maintenance and preservation of artistic assets
Adriana Marra, Institute for Construction Technologies, CNR, Italy
Salvatore Gerbino, University of Campania "Luigi Vanvitelli", Italy
Giovanni Fabbrocino, CNR, University of Molise, Italy

15:10 A parametric model to manage archaeological data
Angela Bosco, Università degli Studi di Napoli L'Orientale, Italy
Laura Carpentiero, Università degli Studi di Napoli L'Orientale, Italy
Andrea D'Andrea, Università degli Studi di Napoli L'Orientale, Italy
Eleonora Minucci, Università degli Studi di Napoli L'Orientale, Italy
Rosario Valentini, Università degli Studi di Napoli L'Orientale, Italy

15:30 An assessment on morphological survey calibration and the automation of digital drawing for the reliable documentation and conservation analysis of out-of-scale buildings
Raffaella De Marco, University of Pavia, Italy
Alessia Miceli, University of Pavia, Italy
Sandro Parrinello, University of Pavia, Italy

15:50 A digital twin for distant visit of inaccessible contexts
Francesco Gabellone

16:20 - 17:40 CET
SESSION 1.3 – SPECIAL SESSION ON MULTISCALE AND MULTITEMPORAL HIGH RESOLUTION REMOTE SENSING AND NON-DESTRUCTIVE TESTING FOR ARCHAEOLOGY AND MONUMENTAL HERITAGE: FROM RESEARCH TO PRESERVATION - PART 3
Room: *Virtual Room #1*
Chairs: Giovanni Leucci, *ISPC - CNR, Italy*
Nicola Masini, *ISPC - CNR, Italy*
Salvatore Piro, *ISPC - CNR, Italy*

16:20 Urban Archaeo-Geophysics in Cusco. The Case Studies of Paraninfo and Casa Concha
Nicola Masini, CNR-ISPC, Italy
Sayri Garcia, Universidad Nacional de San Antonio Abad del Cusco, Peru
Maria Sileo, CNR-ISPC, Italy
Luigi Capozzoli, CNR-IMAA, Italy
David Vera, CNR-IMAA, Italy
Rosa Lasaponara, CNR-IMAA, Italy

16:40 The use of Cone Penetration Tests (CPT) for the study of the dynamic characteristics of the soils
Antonio Cavallaro, National Research Council - Institute of Heritage Science, Italy

17:00 Investigation of archaelogical sites with species distribution models and satellite data
Noviello Mariangela, University of Bari'Aldo Moro', Italy
Cafarelli Barbara, University of Foggia, Italy
Calculli Crescenza, University of Foggia, Italy
Sarris Apostolos, Foundation for Research & Technology, Greece
Mairota Paola, University of Bari'Aldo Moro', Italy

17:20 Multianalytical investigation and 3D Multiband modeling: an integrated survey of the Garnier Valletti pomological collection
Emanuela Grifoni, University of Milan, Italy
Letizia Bonizzoni, University of Milan, Italy

Marco Gargano, University of Milan, Italy
Jacopo Melada,University of Milan, Italy
Ilaria Mignani, University of Milan, Italy
Nicola Ludwig, University of Milan, Italy

16:20 - 17:40 CET
SESSION 2.3 - GENERAL SESSION - PART 1
Room: *Virtual Room #1*
Chairs: Andrea Tavella, *LaBAAF, Università degli Studi di Trento, Italy*
Elisabetta Doria, *DICAr University of Pavia, Italy*

16:20 Preliminary studies on the volumetric capacity of ceramic from the Neolithic site of Lugo di Grezzana (VR) through 3D graphics software
Andrea Tavella, LaBAAF, Università degli Studi di Trento, Italy
Marika Ciela, LaBAAF, Università degli Studi di Trento, Italy
Paolo Chistè, LaBAAF, Università degli Studi di Trento, Italy
Annaluisa Pedrotti, LaBAAF, Università degli Studi di Trento, Italy

16:40 Space & sound characterisation of small-scale architectural heritage: an interdisciplinary, lightweight workflow.
Jean-Yves Blaise, UMR CNRS/MC 3495 MAP 31, France
Iwona Dudek, UMR CNRS/MC 3495 MAP 31, France
Anthony Pamart, UMR CNRS/MC 3495 MAP 31, France
Laurent Bergerot, UMR CNRS/MC 3495 MAP 31, France
Adrien Vidal, Aix Marseille Univ, France
Simon Fargeot, Aix Marseille Univ, France
Mitsuko Aramaki, Aix Marseille Univ, France
Solvi Ystad, Aix Marseille Univ, France
Richard Kronland-Martinet, Aix Marseille Univ, France

17:00 Castiglioni Chapel in Pavia: a methodological approach for documentation and virtualisation techniques
Elisabetta Doria, DICAr University of Pavia, Italy
Francesca Galasso, DICAr University of Pavia, Italy
Marco Morandotti, DICAr University of Pavia, Italy

17:20 Measurements for the reconstruction of ancient walls in opus reticulatum in the basement of the castle of Santo Stefano in Puglia (Italy)
Angela Diceglie, Università degli Studi di Bari Aldo Moro, Italy

16:20 - 17:40 CET
SESSION 3.3 - SPECIAL SESSION ON IoT BASED SYSTEMS FOR THE STRUCTURAL HEALTH MONITORING AND THE ANALYSIS OF CULTURAL HERITAGE BUILDING AND ARCHAEOLOGICAL SITES
Room: *Virtual Room #3*
Chairs: Carmelo Scuro, *University of Calabria, Italy*
Gabriele Milani, *Politecnico di Milano, Italy*

16:20 Motion Magnification Analysis for monitoring Cultural heritage buildings and archeological sites
Sara Forliti, ENEA, Italy
Vincenzo Fioriti, ENEA, Italy
Ivan Roselli, ENEA, Italy
Angelo Tatì, ENEA, Italy
Alessandro Colucci, ENEA, Italy

16:40 IoT-MHECHA: A new IoT architecture for Monitoring Health and Environmental parameters in Cultural Heritage and Archaeological sites.
Giuseppe Campobello, University of Messina, Italy
Alessio Altadonna, University of Messina, Italy
Fabio Todesco, University of Messina, Italy
Nicola Donato, University of Messina, Italy

17:00 Settlement analysis of the masonry umbrella vault of the Masegra Castle
Nicola Grillanda, Politecnico di Milano, Italy
Gabriele Milani, Politecnico di Milano, Italy
Lorenzo Cantini, Politecnico di Milano, Italy
Stefano Della Torre, Politecnico di Milano, Italy

17:20 A Novel Mathematical Structural Model Approach for Low Cost Structural Health Monitoring System

Carmelo Scuro, University of Calabria, Italy
Saverio Porzio, University of Calabria, Italy
Francesco Demarco, University of Calabria, Italy
Domenico L. Carnì, University of Calabria, Italy
Francesco Lamonaca, University of Sannio, Italy
Renato S. Olivito, University of Calabria, Italy

17:40 - 18:20 CET
TUTORIAL SESSION #1
Room: *Virtual Room #1*
Chair: Simona Raneri, *ICCOM CNR, Italy*

Measuring the sound: metrology of historical bow stringed instruments

Franco Zanini
Elettra - Sincrotrone Trieste, Italy

Technical Sessions - Friday, October 23

09:30 - 10:20 CET
PLENARY SESSION
Room: *Virtual Room #1*
Chair: *Paola Fermo, Università degli Studi di Milano, Italy*

In-Situ Differentiation of Black Rock Paintings in the Palaeolithic Caves

Ina Reiche
Research director at PCMTH team, Institut de recherche de Chimie Paris (IRCP)
Centre de recherche et de restauration des musées de France (C2RMF)

10:30 - 11:50 CET
SESSION 1.4 – SPECIAL SESSION ON GEOMATICS AND CULTURAL HERITAGE: MODERN DIGITAL APPROACHES FOR SURVEYING AND DOCUMENTING THE PAST THROUGH GEOSPATIAL SOLUTIONS - PART 1
Room: *Virtual Room #1*
Chairs: Gabriele Bitelli, *University of Bologna, Italy*
Maria Grazia D'Urso, *University of Bergamo, Italy*

10:30 Digital reconstruction of a lost heritage: the San Geminiano's church in San Marco's Square in Venice
Caterina Balletti, Università Iuav di Venezia, Italy
Marcin Dabrowski, Università Iuav di Venezia, Italy
Francesco Guerra, Università Iuav di Venezia, Italy
Paolo Vernier, Università Iuav di Venezia, Italy

10:50 Preliminary data processing on the Roman Shipwreck of Grado. Archive and legacy data to create its 3D virtual model
Elisa Costa, Ca' Foscari University, Italy
Carlo Beltrame, Ca' Foscari University, Italy

11:10 BLK2GO for DTM generation in highly vegetated area for detecting and documenting archaeological earthwork anomalies
M. Limongiello, University of Salerno, Italy
D. Ronchi, Spiron Heritage and Survey, Italy
V. Albano, Leica Geosystems AG, Switzerland

11:30 Fostering Etruscan heritage with effective integration of UAV, TLS and SLAM based methods
Anna Rabbia, Politecnico di Torino, CRT - Fondazione Sviluppo e Crescita, Italy
Giulia Sammartano, Politecnico di Torino, FULL Polito, Italy
Antonia Spanò, Politecnico di Torino, FULL Polito, Italy

10:30 - 11:30 CET
SESSION 2.4 – SPECIAL SESSION ON THE INTERACTION BETWEEN ENVIRONMENTAL POLLUTION AND CULTURAL HERITAGE: FROM OUTDOOR TO INDOOR ENVIRONMENT - PART 1
Room: *Virtual Room #2*
Chairs: Paola Fermo, *University of Milano, Italy*
Valeria Comite, *University of Milano, Italy*

10:30 An experimental approach to the cleaning of a polymateric textile weave: set-up of the alternative methodology and instrumentation
Paola Fermo, Università degli Studi di Milano, Italy
Valeria Comite, Università degli Studi di Milano, Italy
Elisabetta Boanini, Fondazione Enaip Lombardia, Italy
Roberto Bonomi, Fondazione Enaip Lombardia, Italy
Marco Bertelli, A.L.M.A.G. S.p.A, Italy
Elisa Monfasani, Fondazione Enaip Lombardia, Italy

10:50 A new analytic methodology for the characterization of the carbonaceous fraction in black crusts present on stone surfaces
Valeria Comite, Università degli Studi di Milano, Italy
Mauro La Russa, (DiBEST), Università della Calabria, Italy
Paola Fermo, Università degli Studi di Milano, Italy

11:10 Air pollution, black crusts and Cairo monuments: a review
Rovella Natalia, (DiBEST), University of Calabria, Italy

10:30 - 11:50 CET
SESSION 3.4 – SPECIAL SESSION ON ARCHAEOMETRY FOR ARCHAEOLOGY: PROVENANCING AND TECHNOLOGICAL ASSESSMENT OF ARTIFACTS FROM ARCHAEOLOGICAL SITES AND MUSEUMS - PART 1
Room: *Virtual Room #3*
Chairs: Fabrizio Antonelli, *University IUAV of Venice, Italy*
Lara Maritan, *University of Padova, Italy*

10:30 Multi analytical study on Khol residues from the ancient Egyptian city of Assiut
Francesco Saliu, Università Milano Bicocca, Italy
Chiara Riedo, University of Turin, Italy
Dominique Scalarone, University of Turin, Italy
Ilaria Degano, University of Pisa, Italy
Francesca Modugno, University of Pisa, Italy
Sergio Andò, Università Milano Bicocca, Italy
Marco Orlandi, Università Milano Bicocca, Italy
Oscar Chiantore, University of Turin, Italy

10:50 The contribution of Archaeometric Analyses to the Multi Disciplinary Research in Hierapolis of Phrygia, Turkey
Giulia Ricci, University of Padova, Italy
Michele Secco, University of Padova, Italy
Gilberto Artioli, University of Padova, Italy
Fabio Marzaioli, Centre for Isotopic Research on Cultural and Environmental Heritage, Italy
Isabella Passariello, Centre for Isotopic Research on Cultural and Environmental Heritage, Italy
Filippo Terrasi, , Centre for Isotopic Research on Cultural and Environmental Heritage, Italy
Maria Rosa Valluzzi, University of Padova, Italy

11:10 Microscopic and chemical characterization of metal slags found at the Porta Paola excavation in Ferrara
Elena Marrocchino, University of Ferrara, Italy
Chiara Telloli, ENEA, Italy
Carmela Vaccaro, University of Ferrara, Italy

11:30 Chemical investigations of Aegyptiaca through portable X-ray Fluorescence
Germana Barone, Università degli Studi di Catania, Italy
Cristina Maria Belfiore, Università degli Studi di Catania, Italy
Angela Maria Manenti, Parco Archeologico di Siracusa, Eloro e villa del Tellaro, Italy
Maria Mastelloni, Polo Regionale delle Isole Eolie, Parco, Museo Archeologico "L. Bernabò Brea", Italy
Paolo Mazzoleni, Università degli Studi di Catania, Italy

12:00 - 13:00 CET
SESSION 1.5 – SPECIAL SESSION ON GEOMATICS AND CULTURAL HERITAGE: MODERN DIGITAL APPROACHES FOR SURVEYING AND DOCUMENTING THE PAST THROUGH GEOSPATIAL SOLUTIONS - PART 2
Room: *Virtual Room #1*
Chairs: Gabriele Bitelli, *University of Bologna, Italy*
Maria Grazia D'Urso, *University of Bergamo, Italy*

12:00 Integrated geomatic methodologies to reconstruct the ancient topography of Rome
Luca Alessandri, Groningen University, The Netherland
Valerio Baiocchi, Sapienza University of Rome, Italy
Marta Baumgartner, Soprintendenza Speciale di Roma, Italy
Diego Blanco, Archeogeos, Italy
Alessandro Bosman, CNR IGAG, Italy
Luigi Cardone, Sapienza University of Rome, Italy
Andrea Guaglianone, Italy
Matteo Onori, Sapienza University of Rome, Italy
Felicia Vatore, Sapienza University of Rome, Italy

12:20 Geomatics as a knowledge base propaedeutic to the restoration of an extended fresco wall

Gabriele Bitelli, Alma Mater Studiorum Università di Bologna, Italy
Valentina Alena Girelli, Alma Mater Studiorum Università di Bologna, Italy
Giulia Vannucci, Alma Mater Studiorum Università di Bologna, Italy
Emanuele Mandanici, Alma Mater Studiorum Università di Bologna, Italy
Marinella Pigozzi, Alma Mater Studiorum Università di Bologna, Italy

12:40 Survey and preservation of an abandoned archaeological industrial site

Maria Grazia D'Urso, University of Bergamo, Italy
Valerio Manzari, University of Cassino and Southern Lazio, Italy
Francesco Cavaliere, Italy
Barbara Marana, University of Bergamo, Italy
Francesco Marmo, University of Naples Federico II, Italy

11:40 - 13:40 CET
SESSION 2.5 – SPECIAL SESSION ON NEUTRON TECHNIQUES IN ARCHEOMETRY
Room: *Virtual Room #2*
Chairs: Francesco Grazzi, *CNR, Italy*
Marco Zanatta, *University of Trento, Italy*

11:40 Determining the composition from the inside out – the development of elemental analysis using muonic X-rays and gammas

Adrian Hillier, ISIS Pulsed Neutron and Muon source, STFC Rutherford Appleton Laboratory, United Kingdom
Bethany V Hampshire, ISIS Pulsed Neutron and Muon source, University of Warwick, Italy
Katsu Ishida, RIKEN Nishina Center, Japan

12:00 Reconstruction of 3D models from microtomographic images of archeological artifacts

Enej Gucek Puhar, University of Ljubljana, Slovenia
Lidija Korat, Slovenian National Building and Civil Engineering Institute, Slovenia
Miran Eric, Institute for the Protection of Cultural Heritage, Slovenia
Ales Jaklic, University of Ljubljana, Slovenia
Franc Solina, University of Ljubljana, Slovenia

12:20 Preliminary Alloys Characterization and Technological Interpretation of the Manufacturing Process of the Vittoria Alata di Brescia by means of Neutron Diffraction

F. Cantini, MIBACT Opificio delle Pietre Dure, Italy
M. Galeotti, MIBACT Opificio delle Pietre Dure, Italy
A. Cagnini, MIBACT Opificio delle Pietre Dure, Italy
S. Porcinai, MIBACT Opificio delle Pietre Dure, Italy
A. Scherillo, ISIS Neutron and Muon Source, United Kingdom
A. Brini, MIBACT Opificio delle Pietre Dure, Italy
A. Patera, MIBACT Opificio delle Pietre Dure, Italy
F. Morandini, Fondazione Brescia Musei, Italy
F. Grazzi, CNR, INFN, Italy

12:40 Neutron-based techniques applied for non-destructive quantitative characterisation of ancient mosaic tesserae

Giulia Marcucci, University of Milano Bicocca, INFN, Italy
Antonella Scherillo, ISIS Neutron and Muon Source, United Kingdom
Carlo Cazzaniga, ISIS Neutron and Muon Source, United Kingdom
Massimiliano Clemenza, University of Milano Bicocca, INFN, Italy
Daniela Di Martino, University of Milano Bicocca, INFN, Italy

13:00 Preliminary result of investigation of element composition of Kyathos (6th-4th centuries BCE) from the necropolis Volna 1 on the Taman Peninsula by Neutron Resonance Capture Analysis

N. V. Simbirtseva, Joint Institute for Nuclear Research, Russia, Institute of Nuclear Physics, Republic of Kazakhstan
P. V. Sedyshev, Joint Institute for Nuclear Research, Russia
S. T. Mazhen, Joint Institute for Nuclear Research, Russia, Institute of Nuclear Physics, Republic of Kazakhstan
A. M. Yergashov, Joint Institute for Nuclear Research, Russia, Institute of Nuclear Physics, Republic of Kazakhstan
I. A. Saprykina, Institute of Archaeology of the Russian Academy of Sciences, Russia
R.A. Mimokhod, Institute of Archaeology of the Russian Academy of Sciences, Russia

13:20 Non-invasive characterization of Nuragic bronzes through neutron based techniques

M. Cataldo, Università degli Studi di Sassari, Italy
F. Grazzi, CNR, Istituto di Fisica Applicata "Nello Carrara", Italy
A. Scherillo, ISIS Neutron Source, United Kingdom
A. Fedrigo, ISIS Neutron Source, United Kingdom
A. Depalmas, Università degli Studi di Sassari, Italy
A. Canu, Soprintendenza Archeologia, Belle Arti e Paesaggio per le province di Sassari e Nuoro, Italy
A. Brunetti, Università degli Studi di Sassari, Italy

12:00 - 13:00 CET
SESSION 3.5 – SPECIAL SESSION ON ARCHAEOMETRY FOR ARCHAEOLOGY: PROVENANCING AND TECHNOLOGICAL ASSESSMENT OF ARTIFACTS FROM ARCHAEOLOGICAL SITES AND MUSEUMS - PART 2
Room: *Virtual Room #3*
Chairs: Fabrizio Antonelli, *University IUAV of Venice, Italy*
Lara Maritan, *University of Padova, Italy*

12:00 Archaeology and archaeometry of marbles in Roman central Adriatic Italy

Devi Taelman, Ghent University, Belgium
Dimitri Van Limbergen, Ghent University, Belgium
Fabrizio Antonelli, IUAV University of Venice, Italy

12:20 Analytical data on marble sculptures' polychrome traces (Palatine hill, Rome)

Maria Cristina Caggiani, University of Catania, Italy
Alessia Coccato, University of Catania, Italy
Silvia Borghini, Museo Nazionale Romano, Italy
Paolo Mazzoleni, University of Catania, Italy
Alfonsina Russo, Parco Archeologico del Colosseo, Italy
Germana Barone, University of Catania, Italy

12:40 Colorimetric Study of Ayla-Aksum amphorae from the Red Sea Coast of Eritrea

Abraham Zerai, Università di Torino, INFN, Italy
Patrizia Davit, Università di Torino, Italy

Monica Gulmini, Università di Torino, Italy
Alessandro Re, Università di Torino, INFN, Italy
Roberto Giustetto, Università di Torino, INFN, Italy
Lara Maritan, Università di Padova, Italy
Serena Massa, Università Cattolica del Sacro Cuore, Italy
Chiara Mandelli, Università Cattolica del Sacro Cuore, Italy
Yohannes Gebreyesus, Northern Red Sea Regional Museum of Massawa, Eritrea
Alessandro Lo Giudice, Università di Torino, INFN, Italy

13:20 - 14:30 CET
POSTER SESSION 2
Room: *Virtual Poster Room*

PS 2.1 Project of Electronic Identity of painting

Giuseppe Schirripa Spagnolo, Università degli Studi Roma Tre, Italy
Lorenzo Cozzella, Università degli Studi Roma Tre, Italy
Fabio Leccese, Università degli Studi Roma Tre, Italy

PS 2.2 The coloured stones and marbles decorating the Odeion of Pompeii

Fabrizio Antonelli, Iuav University of Venice, Italy
Lorenzo Lazzarini, Iuav University of Venice, Italy
Stefano Cancelliere, Iuav University of Venice, Italy
Luigi Buffone, Applied research laboratory of the Archaeological Park of Pompeii, Italy

PS 2.3 DAMAGE assessment of cultural stone heritage in reservoir environments

Monica Alvarez de Buergo, IGEO (CSIC, UCM), Spain
Natalia Perez Ema, IGEO (CSIC, UCM), Spain
Rafael Fort, IGEO (CSIC, UCM), Spain
Manuel Garcia Rodriguez, Universidad de Eduacion a Distancia UNED, Spain
María J. Varas, IGEO (CSIC, UCM), Spain
Mauro F. La Russa, Università della Calabria, Italy

PS 2.4 A preliminary study on black crusts from the Monumental Cemetery of Milan

Valeria Comite, Università degli studi di Milano, Italy
Donatella Bonelli, Scuola di Restauro 'Arrigo Boito' Italy
Paola Fermo, Scuola di Restauro 'Arrigo Boito' Italy

PS 2.5 Coratelli Mill: micro-geophysical investigations for structural diagnostics
Lara De Giorgi, CNR ISPC, Italy
Giovanni Leucci, CNR ISPC, Italy

PS 2.6 Geophysical investigations at the Cathedral of Catania
Giovanni Leucci, CNR ISPC, Italy
Lara De Giorgi, CNR ISPC, Italy
Giovanni Fragalá, CNR, Italy
Antonino Mazzaglia, CNR, Italy
Daniele Malfitana, CNR, Italy

PS 2.7 GIS for the cataloging and enhancement of "specchie" located in the Upper Salento in Apulia Region (Southern Italy)
Maurizio Delli Santi, ISPC-CNR, Italy

PS 2.8 Geophysical investigations, digital reconstruction and numerical modeling at the Batia Church in Tortorici (Messina, Sicily): preliminary results
Sebastiano D'Amico, University of Malta, Malta
Emanuele Colica, University of Malta, Malta
Raffele Persico, Università della Calabria, Italy
Michele Betti, University of Florence, Italy
Salvatore Foti, Studio di Ingegneria, Associazione Centro di Storia Patria dei Nebrodi, Italy
Maurizio Paterniti Barbino, Studio Geom. Maurizio Paterniti Barbino
Luciano Galone, University of Malta, Malta

PS 2.9 Preliminary geophysical surveys and archaeological studies into the buried urban plan of the Lucanian settlement of Caselle in Pittari
Luigi Capozzoli, CNR- IMAA, Italy
Gregory De Martino, CNR- IMAA, Italy
Vincenzo Lapenna, CNR- IMAA, Italy
Felice Perciante, CNR- IMAA, Italy
Enzo Rizzo, CNR- IMAA, University of Ferrara, Italy
Maria Luigia Rizzo, Università degli Studi di Salerno, Italy
Antonia Serritella, Università degli Studi di Salerno, Italy
Michele Scafuro, Università degli Studi di Salerno, Italy
Ottavia Voza, Università degli Studi di Salerno, Italy

PS 2.10 Preliminary study for the preservation of two natural horns from the end of the 17th century

Michela Albano, CISRiC, University of Pavia, Politecnico di Milano, Italy
Giacomo Fiocco, CISRiC, University of Pavia, University of Turin, Italy
Piercarlo Dondi, CISRiC, University of Pavia, Italy
Francesca Tasso, Castello Sforzesco, Italy
Valentina Ricetti, Castello Sforzesco, Italy
Daniela Comelli, Politecnico di Milano, Italy
Maurizio Licchelli, University of Pavia, Italy
Claudio Canevari, University of Pavia
Marco Malagodi, CISRiC, University of Pavia, Italy

PS 2.11 Towards the study of alteration patinas on the marble surface of a Renaissance sculptural group from the Museum of Ancient Art (Castello Sforzesco, Milan)

Valeria Comite, Università degli Studi di Milano, Italy
Mario Colella, Università degli Studi di Milano, Piccolo chiostro s.r.l., Italy
Marco Malagodi, CISRiC, University of Pavia, Italy
Giacomo Fiocco, CISRiC, University of Pavia, Università di Torino, Italy
Michela Albano, University of Pavia, Polytechnic of Milan, Italy
Silvia Marchioron, Piccolo chiostro s.r.l., Italy
Paola Fermo, Università degli Studi di Milano, Italy

PS 2.12 Environmental impact on historical monuments: the black crusts of the Venice lagoon

Luciana Randazzo, DiBEST, Italy
Natalia Rovella, DiBEST, Italy
Silvia Muto, DiBEST, Italy
Fabrizio Antonelli, University Iuav di Venezia, Italy
Elena Tesser, University Ca' Foscari, Venice, Italy
Mauro Francesco La Russa, DiBEST, Italy

PS 2.13 Frescoed wall conditions assessment with noninvasive GPR survey: the case of the Crypt of San Francesco in Irsina (Basilicata, Southern Italy)

L. Capozzoli, CNR-IMAA, Italy
M.P. Boccia
G. De Martino, CNR-IMAA, Italy
F.T. Gizzi, CNR-ISPC, Italy

M. Sileo, CNR-ISPC, Italy
N. Masini, CNR-ISPC, Italy

PS 2.14 L'Avventuroso 1936 project: the first analytical approach to printed historic Italian comics
Giacomo Fiocco, Università degli Studi di Pavia, Università di Torino, Italy
Tommaso Rovetta, Università degli Studi di Pavia, Italy
Michela Albano, Università degli Studi di Pavia, Politecnico di Milano, Italy
Mario A. Lazzari, Scuola di Restauro Cr.Forma, Italy
Curzio Merlo, Università degli Studi di Pavia, Scuola di Restauro Cr.Forma, Italy
Marco Malagodi, Università degli Studi di Pavia, Italy

PS 2.15 Aerosol tracers deposition in a controlled field experiment: role of surface building materials
Pierina Ielpo, National Research Council, Italy
Patrick Conry, University of Notre Dame, USA
Alessandra Genga, University of Salento, Italy
Riccardo Buccolieri, University of Salento, Italy
Livia Giotta, University of Salento, Italy
Francesca Di Nicola, University of Salento, Italy
Maria Lisa Vincenti, University of Salento, Italy
Ludovico Valli, University of Salento, Italy
H. J. S. Fernando, University of Notre Dame, USA
Silvana Di Sabatino, University of Bologna, Italy

14:30 - 15:20 CET
PLENARY SESSION
Room: *Virtual Room #1*
Chair: Nicola Masini, *ISPC - CNR, Italy*

What's next in past landscapes studies? Drone-based platform a killer application in archaeological survey

Stefano Campana
Dipartimento delle Scienze Storiche e dei Beni Culturali, Università degli Studi di Siena, Italy

15:30 - 17:30 CET
SESSION 1.6 – SPECIAL SESSION ON HANDHELD AND MOBILE INSTRUMENTATION IN CULTURAL HERITAGE RESEARCH
Room: *Virtual Room #1*
Chairs: Rosina Celeste Ponterio, *CNR, Italy*
Giulia Festa, *Centro Fermi, Italy*
Maria Luisa Saladino, *University of Palermo, Italy*
Viviana Mollica Nardo, *CNR, Italy*

15:30 A multidisciplinary approach about study of Orgères's metal finds (La Thuile, Aosta-Italy): archaeological excavation and XRF analysis.
Chiara Maria Lebole, University of Torino, Italy
Greta Lupano, University of Torino, Italy
Sylvie Cheney, Autonomous Region of Valle d'Aosta, Italy
Giorgio Di Gangi, University of Torino, Italy

15:50 Modular MA-XRF scanner potentialities and further advances
Sergio Augusto Barcellos Lins, La Sapienza Università di Roma, INFN Roma Tre, Italy
Marta Manso, Universidade Nova de Lisboa, Portugal
Giovanni Ettore Gigante, La Sapienza Università di Roma, Italy
Roberto Cesareo, Università degli Studi di Sassari, Italy
Luca Tortora, INFN Roma Tre, Italy
Paolo Branchini, INFN Roma Tre, Italy
Stefano Ridolfi, Università degli Studi di Sassari, Italy

16:10 Non destructive spectroscopic methods for gem analysis: a short review
Simona Raneri, ICCOM CNR, Italy
Germana Barone, University of Catania, Italy
Paolo Mazzoleni, University of Catania, Italy
Danilo Bersani, University of Parma, Italy

16:30 INFN-CHNet meets CCR La Venaria Reale: first results
Leandro Sottili, Università degli Studi di Torino, INFN, Italy
Laura Guidorzi, Università degli Studi di Torino, INFN, Italy
Anna Mazzinghi, INFN, Università degli Studi di Firenze, Italy
Chiara Ruberto, INFN, Università degli Studi di Firenze, Italy
Lisa Castelli, INFN, Italy
Caroline Czelusniak, INFN, Italy

Lorenzo Giuntini, INFN, Università degli Studi di Firenze, Italy
Mirko Massi, INFN, Italy
Francesco Taccetti, INFN, Italy
Marco Nervo, INFN, "La Venaria Reale", Italy
Alessandro Re, Università degli Studi di Torino, INFN, Italy
Alessandro Lo Giudice, Università degli Studi di Torino, INFN, Italy

16:50 Imaging for Cultural Heritage and Archaeology
Paolo Triolo, University of Genova and University of Urbino, Italy
Luciano Marras, Art-Test Studio di Luciano Marras, Italy
Gloria Adinolfi, Società Pegaso, Italy
Rodolfo Carmagnola, Società Pegaso, Italy
S. Legnaioli, ICCOM-CNR, Italy
S. Raneri, ICCOM-CNR, Italy
V.Palleschi, ICCOM-CNR, Italy

17:10 Santa Maria del Fiore Cupola construction tools: a non-invasive characterization using portable XRF
Leila Es Sebar, Politecnico di Torino, Italy
Leonardo Iannucci, Politecnico di Torino, Italy
Sabrina Grassini, Politecnico di Torino, Italy
Emma Angelini, Politecnico di Torino, Italy
Marco Parvis, Politecnico di Torino, Italy
Andrea Bernardoni, Museo Galileo, Italy
Alexander Neuwahl, Artes Mechanicae, Italy
Rita Filardi, Museo dell'Opera del Duomo, Italy

15:30 - 17:10 CET
SESSION 2.6 – SPECIAL SESSION ON DAMAGE ASSESSMENT: DIAGNOSIS AND MONITORING FOR THE RESTORATION, PREVENTIVE CONSERVATION AND MAINTENANCE OF CH
Room: *Virtual Room #2*
Chairs: Giuseppe Paladini, *University of Messina, Italy*
Luciana Randazzo, *University of Calabria, Italy*
Natalia Rovella, *University of Calabria, Italy*

15:30 Ancient bricks technologies: improving the built heritage conservation at high humidity areas
Elena Pérez Monserrat, University of Padua, Italy
Lara Maritan, University of Padua, Italy
Marie Ange Causarano, University of Padua, Italy
Alejandra Chavarría, University of Padua, Italy
Gian Pietro Brogiolo, University of Padua, Italy

15:50 Polydimethylsiloxane (PDMS) /ZrO2 doped ZnO nanocomposites as protective coatings for stone materials
Maduka L. Weththimuni, Università di Pavia, Italy
Marwa Ben Chobba, University of Sfax, Tunisia
Ilenia Tredici, Università di Pavia, Italy
Maurizio Licchelli, Università di Pavia, Italy

16:10 Digital reconstruction and scientific analysis prior the restoration of two paintings by Mattia Preti in the Church of the Immaculate Conception of Sarria (Floriana, Malta)
Sebastiano D'Amico, University of Malta, Malta
Valentina Venuti, University of Messina, Italy
Emanuele Colica, University of Malta, Malta
Giuseppe Paladini, University of Messina, Italy
Luciano Galone, University of Malta, Malta
Vincenza Crupi, University of Messina, Italy
Domenico Majolino, University of Messina, Italy
Sante Guido, University of Trento, Italy
Giuseppe Mantella, Restauro Opere D'Arte, Italy

16:30 The three polych rome mosaics of S. Aloe quarter in Vibo Valentia (Calabria , Southern Italy): chemical characterization of glass tesserae
Natalia Rovella, University of Calabria, Italy
Elia Fiorenza, University of Calabria, Italy
Donatella Barca, University of Calabria, Italy

16:50 The role of geosciences and non destructive methods in the TECTONIC project
Michela Ricca, University of Calabria, Italy
Marco Ricci, University of Calabria, Italy
Stefano Laureti, University of Calabria, Italy
Mauro Francesco La Russa, University of Calabria, Italy

15:30 - 17:10 CET
SESSION 3.6 – SPECIAL SESSION ON ARCHAEOMETRY FOR ARCHAEOLOGY: PROVENANCING AND TECHNOLOGICAL ASSESSMENT OF ARTIFACTS FROM ARCHAEOLOGICAL SITES AND MUSEUMS - PART 3
Room: *Virtual Room #3*
Chairs: Fabrizio Antonelli, *University IUAV of Venice, Italy*
Lara Maritan, *University of Padova, Italy*

15:30 A multi-analytical survey for the identification of the red and yellow pigments of coloured sherds discovered in the Monte d'Oro area (Rome).
Vittoria Guglielmi, Università degli Studi di Milano, Italy
Paola Fermo, Università degli Studi di Milano, Italy
Martina Andreoli, University of Trento, Italy
Valeria Comite, Università degli Studi di Milano, Italy

15:50 The pottery production at Sumhuram (Khor Rori, Sultanate of Oman): an archaeometric study
Stefano Pagnotta, University of Pisa, Italy
Giulia Buono, University of Pisa, Italy
Marco Lezzerini, University of Pisa, Italy
Alexia Pavan, Ministry of Heritage and Tourism, Muscat Salalah, Sultanate of Oman
Carlotta Rizzo, University of Pisa, Italy

16:10 Petrographic analysis to understand Etruscan architectural terracotta's technology and provenance: a study in progress.
Maura Fugazzotto, University of Catania, Italy
Antonio Stroscio, University of Catania, Italy
Antonella Bertino, University of Catania, Italy
Germana Barone, University of Catania, Italy
Alfonsina Russo, Parco Archeologico del Colosseo, Italy
Paolo Mazzoleni, University of Catania, Italy

16:30 Beyond the archaeometric analysis of the terracotta figurines: disclosing the ceramic production choices at Barikot (northern Pakistan)
Lara Maritan, University of Padova, Italy
Luca Maria Olivieri, Ca' Foscari University of Venice, Italy
Giusy Esposito, University of Naples 'L'Orientale', Italy
Gennaro Alterio, University of Naples 'L'Orientale', Italy
Anna Filigenzi, University of Naples 'L'Orientale', Italy

16:50 Thermoluminescence dating and microstructural characterization of archaeological ceramic samples from Corvins'Castle area
Rodica-Mariana Ion, ICECHIM, Group, Valahia University, Romania
Radu Setnescu, INCDIE ICPE-CA, Valahia University of Targoviste, Romania
Tanta Setnescu, Valahia University of Targoviste, Romania
Anca Irina Gheboianu, Valahia University of Targoviste, Romania
Gabriel Vasilievici, ICECHIM, Group, Romania
Sorin Tincu, Corvins' Castle, Romania

17:40 - 18:20 CET
TUTORIAL SESSION #2
Room: *Virtual Room #1*
Chair: Vincenzo Palleschi, *ICCOM-CNR, Italy*

Digital Replica Of An Ancient Artefact

Paolo Bosetti
University of Trento, Italy

Ciro Malacarne
ProM Facility, Italy

Technical Sessions - Saturday, October 24

09:20 - 10:10 CET
PLENARY SESSION
Room: *Virtual Room #1*
Chair: Marco Zanatta, *University of Trento, Italy*

Long-distance timber trading in the Roman Empire

Mauro Bernabei
National Research Council of Italy - Institute of BioEconomy (IBE), Italy

10:20 - 12:00 CET
SESSION 1.7 – GENERAL SESSION - PART 2
Room: *Virtual Room #1*
Chairs: Mauro Bernabei, *CNR IBE, Italy*
Nicoletta Martinelli, *Laboratorio Dendrodata, Italy*

10:20 Effect of age on Pine wood microstructure studied by micro-MRI and diffusion-NMR
Valeria Stagno, Sapienza University of Rome, National Research Council, Italy
Sveva Longo, National Research Council, University of Messina, Italy
Silvia Capuani, National Research Council, Italy

10:40 Multicentennial regional oak chronologies for northern Italy: an updating
Nicoletta Martinelli, Laboratorio Dendrodata, Italy

11:00 The tree species of Po valley Logboats
Alice Lucchini, Università Ca Foscari di Venezia, Italy
Mauro Bernabei, CNR IBE, Italy

11:20 Characterization of Etruscan non vascular ceramic fragments
Margherita Cantelli, Ca' Foscari University of Venice, Italy
Alberta Facchi, Ministry of Cultural Heritage and Activities
Francesca C. Izzo, Ca' Foscari University of Venice, Italy
Elisabetta Zendri, Ca' Foscari University of Venice, Italy

11:40 May metagenomics disclose the hidden secrets of the ancient damaged parchments?
Luciana Migliore, Tor Vergata University, Italy
Nicoletta Perini, Tor Vergata University, Italy
Annamaria Alabiso, Tor Vergata University, Italy

10:20 - 12:20 CET
SESSION 2.7 – GENERAL SESSION - PART 3
Room: *Virtual Room #2*
Chairs: Ilaria Patania, *University of Haifa, Israel*
Omar Larentis, *University of Insubria, Italy*
Fabio Santaniello, *University of Trento, Italy*

10:20 Distinguishing colour alteration processes occurred in Late Pleistocene animal remains
Andrea Perez, University of Trento, Italy
Fabio Santaniello, University of Trento, Italy
Stefano Grimaldi, University of Trento, Italy
Stefano Gialanella, University of Trento, Italy

10:40 Differences between archaeological and forensic burned samples using powder X-ray diffraction (XRD) and ATR-IR spectrometry
Giampaolo Piga, University of Coimbra, Portugal
Fabio Cavalli, Julian-Isontine Universitary Integrated Health Enterprise (ASUGI),Italy
Dario Innocenti, Julian-Isontine Universitary Integrated Health Enterprise (ASUGI),Italy
Eugénia Cunha, University of Coimbra, Portugal
Stefano Enzo, University of Sassari, Italy
David Gonçalves, University of Coimbra, Portugal, Archaeosciences Laboratory, Spain

11:00 The Roman bridge of Canosa di Puglia: a metrological approach
Germano Germanò, Polytechnic University of Bari, Italy

11:20 Optical micro-profilometry for surface analysis and 3D printed replica of archeological artefacts
Sara Mazzocato, University of Verona, Italy
Giacomo Marchioro, University of Verona, Italy
Alessandra Menegazzi, University of Padua, Italy
Claudia Daffara, University of Verona, Italy

11:40 Operational methodology for a historical, critical and virtual reconstruction of Baroque ephemeral apparatuses
Margherita Antolini

12:00 Upgrade of the x-ray imaging set-up at CCR "La Venaria Reale": the case study of an Egyptian wooden statuette
L. Vigorelli, Politecnico di Torino, Università degli Studi di Torino, INFN, Italy
A. Lo Giudice, Università degli Studi di Torino, INFN, Italy
T. Cavaleri, Centro Conservazione e Restauro "La Venaria Reale", Italy
P. Buscaglia, Centro Conservazione e Restauro "La Venaria Reale", Italy
M. Nervo, INFN, Centro Conservazione e Restauro "La Venaria Reale", Italy
P. Del Vesco, Fondazione Museo delle Antichità Egizie di Torino, Italy
M. Borla, Soprintendenza ABAP-TO, Italy
S. Grassini, Politecnico di Torino, Italy
A. Re, Università degli Studi di Torino, INFN, Italy

10:20 - 12:00 CET
SESSION 3.7 – SPECIAL SESSION ON THE INTERACTION BETWEEN ENVIRONMENTAL POLLUTION AND CULTURAL HERITAGE: FROM OUTDOOR TO INDOOR ENVIRONMENT - PART 2
Room: *Virtual Room #3*
Chairs: Paola Fermo, *University of Milano, Italy*
Valeria Comite, *University of Milano, Italy*

10:20 An Innovative Fluorinated Polyacrylic Coating for the Protection of the Cultural Heritage
Eleonora Pargoletti, Università degli Studi di Milano, Consorzio INSTM, Italy
Valeria Comite, Università degli Studi di Milano, Consorzio INSTM, Italy
Valentina Sabatini, Università degli Studi di Milano, Italy
Paola Fermo, Università degli Studi di Milano, Consorzio INSTM, Italy
Marco Aldo Ortenzi, Università degli Studi di Milano, Italy
Hermes Farina, Università degli Studi di Milano, Italy
Giuseppe Cappelletti, Università degli Studi di Milano, Consorzio INSTM, Italy

10:40 Correlation of indoor air quality and stable carbon isotope ratio of CO2 in historical monuments of Italy: a case study
Concetta Pironti, University of Salerno, Italy
Maria Ricciardi, University of Salerno, Italy
Antonio Proto, University of Salerno, Italy
Raffaele Cucciniello, University of Salerno, Italy
Antonino Fiorentino, University of Salerno, Italy
Oriana Motta, University of Salerno, Italy

11:00 Black crusts grown on varied stone substrata from historical buildings under different air quality scenarios (SE and NW Spain)
José Santiago Pozo-Antonio, Universidade de Enxeñaría de Minas e Enerxía, Spain
Carolina Cardell, University of Granada, Spain
Valeria Comite, Università degli Studi di Milano, Italy
Paola Fermo, Università degli Studi di Milano, Italy

11:20 Chemical and isotopic investigations on the deterioration of the Monumental Complex of S. Pietro in Corte in Salerno (Italy) caused by the rising waters
Maria Ricciardi, University of Salerno, Italy
Concetta Pironti, University of Salerno, Italy
Oriana Motta, University of Salerno, Italy
Rosa Fiorillo, University of Salerno, Italy
Federica Camin, Fondazione Edmund Mach, University of Trento, Italy
Antonio Proto, University of Salerno, Italy

11:40 Indoor air quality monitoring with stable carbon isotope ratio of CO2 in Museum Environments: study for the Leonardo da Vinci's "Last Supper"

Oriana Motta, University of Salerno, Italy
Concetta Pironti, University of Salerno, Italy
Maria Ricciardi, University of Salerno, Italy
Ezio Bolzacchini, University of Milano-Bicocca, Italy
Luca Ferrero, University of Milano-Bicocca, Italy
Chiara Rostagno, Direzione Regionale Museale Regionale della Lombardia, Italy
Raffaele Cucciniello, University of Salerno, Italy
Antonio Proto, University of Salerno, Italy

12:20 - 13:00 CET
TUTORIAL SESSION #3
Room: *Virtual Room #1*
Chair: Ilaria Patania, *University of Haifa, Israel*

Evidence of thermal processing of iron-rich materials during Prehistory

Giovanni Cavallo
Institute of Materials and Constructions, University of Applied Sciences and Arts of Southern Switzerland - SUPSI, Switzerland

13:00 - 13:20 CET
CLOSING AND AWARD CEREMONY
Room: *Virtual Room #1*