



CONFERENCE PROGRAM



2025 IMEKO TC26 INTERNATIONAL CONFERENCE ON

METROLOGY for ARCHAEOLOGY and CULTURAL HERITAGE

BERGAMO, ITALY

OCTOBER 15-17, 2025



TABLE OF CONTENTS

TABLE OF CONTENTS 1

MetroArchaeo 2025 Committee 2

MetroArchaeo 2025 Keynote Speakers..... 6

MetroArcheo 2025 Social Events..... 14

MetroArchaeo 2025 Patronages 15

MetroArchaeo 2025 Sponsors 16

Program Schedule - Wednesday, October 15..... 17

Program Schedule - Thursday, October 16..... 18

Program Schedule - Friday, October 17..... 19

Technical Program - Wednesday, October 15 20

Technical Program - Thursday, October 16 27

Technical Program - Friday, October 17 38

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MetroArchaeo 2025 Keynote Speakers

Plenary Session - Wednesday October 15 - H 16:30



Aerospace Technologies and Artificial Intelligence for the Protection of Cultural Heritage

Lt. Col. Giuseppe Marseglia

Comando Carabinieri Tutela Patrimonio Culturale, Italy

ABSTRACT

Remote sensing by satellite and/or drone, in synergy with GIS (Geographic Information System) systems, is a fundamental tool for obtaining information (even in real time) on immovable cultural heritage, useful to all actors involved in the protection and safeguarding, but also in the enhancement, of the national cultural heritage and in particular of the archaeological cultural heritage. This type of remote sensing (satellite/drone), through hyperspectral and multispectral imaging, aerial photogrammetry and geospatial analysis, is a valid tool for the surveillance and monitoring of our cultural heritage.

The illicit trafficking of cultural heritage is currently countered by the personnel of the Carabinieri Command for the Protection of Cultural Heritage (CC TPC), engaged daily in the control of the thousands of data and information available on the web or provided by the other Law Enforcement Agencies (LEAs), with the support of the computer systems and archives developed by the CC TPC Command over the last decades.

In Leonardo TPC, the IT system used by the CC TPC to store all the activities carried out for ensuring the protection of cultural heritage, more than 7M objects are contained are surveyed and of these, 1.3 M are to be searched, constituting the Italian stolen works of art database; it is therefore an enormous amount of information that is difficult to manage and consult.

However, the increasingly frequent use of electronic channels, instead of traditional ones, for the illicit trade or export abroad of suspicious cultural goods, makes it necessary to have IT tools, constantly evolved and perfected, such as to speed up the number of checks carried out, through automatic search procedures and "smart" search algorithms.

On the basis of these considerations, a design solution was born (Project n.114.5.1 – Co-financed by EU ISF Program 2014-2020) that consists, on the one hand, in the creation of a new system called S.W.O.A.D.S. (Stolen Works Of Art Detection System), for the search and identification of stolen works of art and, on the other hand, in the evolution of the existing system through substantial evolutionary implementation of its main software components, necessary to obtain better results from the interaction with SWOADS.

SPEAKER BIOGRAPHY

- Lieutenant Colonel Commander of the Carabinieri TPC Group for Central Northern Italy
- Graduated in Classical Literature from the University of Padua and in Conservation of Cultural Heritage from the University of Viterbo.
- Specialized in Archaeology at the Specialization School of Syracuse.
- Employed for 25 years in the TPC, as commander of the regional units in Turin, Palermo, Venice.
- Employee in multiple international missions for the Protection of Cultural Heritage, including Iraq, Jordan, Libya, Peru, Bolivia, Argentina, Ecuador, North Macedonia.

Plenary Session - Wednesday October 15 - H 17:00



The history of the Bergamo irrigation ditches

Dr Mario Reduzzi

Consorzio di Bonifica della Media Pianura Bergamasca

ABSTRACT

The intervention traces the multi-millennial history of Bergamo irrigation from the oldest testimonies to the present. For centuries, the Bergamo area has been crossed by many irrigation ditches, also known in the past as *seriole*, of different sizes and importance, which characterize the territory both from an urban, historical and naturalistic point of view. The first findings relating to irrigation ditches in Bergamo date back to the time of Rome. In the medieval period (in particular in the era of the Municipalities after the passage of water rights from Emperor Frederick Barbarossa to the cities), there was a very strong development of the irrigation ditches that saw the construction of important canals, such as the Morlana and the Serio. Especially in this period the irrigation ditches also marked the development of inhabited centers, in particular of the city of Bergamo: for example, along the Serio canal was traced a large part of the fourteenth-century fortifications, called *Muraine*. In the last decades of the Middle Ages, the second half of the 1400s, thanks to the work of the famous leader Bartolomeo Colleoni, new irrigation ditches were traced (such as the Curna, Colleonesca, Borgogna) and others were improved (such as Morlana, Martinenga), going to greatly expand the territory touched by this type of large irrigation. The development of the network of irrigation ditches in Bergamo has never ceased even in the following period, from the Republic of Venice to the unification of Italy (fifteenth-nineteenth century), albeit to a lesser extent. This wealth of water has allowed both agricultural development and proto-industrial and industrial development, given that for centuries, until the 1800s, the main driving force for machinery was the water brought by the irrigation ditches. Also for this reason, a new strong development of irrigation and the creation or improvement of more or less large irrigation ditches took place in the 1800s and 1900s, in the era of industrialization and agrarian improvement. In 1955, with the birth of the Consorzio di Bonifica della Media Pianura Bergamasca, we entered the contemporary era that has brought strong innovation to the sector and acts for the present and future of irrigation and for the management of the territory. The Bergamo irrigation ditches constitute an important historical, economic and environmental heritage for the community, with roots in the distant past, but projected towards the future.

SPEAKER BIOGRAPHY

- Mario Reduzzi, Bergamo, 13 July 1960;
- Degree in economics and business in 1984;
- Foreign degree in engineering in 2002;
- Expert in public administration, economics, public works, budget auditing, public and private accounting, land reclamation and irrigation, territorial planning, hydraulic and agricultural engineering, journalism and communication;
- Registered with the national order of journalists since 1982;
- Auditor registered with the national association since 1985;
- Member of the regional union of engineers of Cotè d'Azur France since 2002;
- Administrative director and secretary of the administrative bodies of the Consorzio di Bonifica della Media Pianura Bergamasca since 1987;
- General Manager of the Consorzio di Bonifica since 2000;
- Auditor at the Consorzio dell'Adda four-year period 2023-2026;
- General Manager of the A.N.B.I. Lombardia (Associazione Nazionale Bonifiche Irrigazioni Miglioramenti Fondiari) from 2024;
- Councilor of the A.N.B.I. Nazionale from 2025.

Plenary Session - Thursday October 16 - H 11:10



Exploring the Roman city of Pollentia and its Hinterland using multiplatform remote sensing imagery

Dr Eduard Angelats

Centre Tecnològic de Telecomunicacions de Catalunya - CERCA, Spain

ABSTRACT

Pollentia, the Roman city in Alcúdia (Mallorca, Spain) has been the focus of extensive archaeological investigations for decades. Over time, the integration of Geomatics technologies has transformed archaeological research, allowing for increasingly precise documentation, analysis, and preservation of the site. Traditional surveys and documentation, including ceramic prospection and total station-based documentation and hand-drawing, have evolved into workflows that incorporate too geophysical surveys, aerial and UAV ortho mosaics generation and analysis, photogrammetry-based high-resolution digital surface model generation, automatic documentation, multispectral satellite series analysis, enabling the reconstruction of Pollentia's architectural and landscape transformations.

In recent years, the use of multisensor and multiplatform remote sensing imagery has expanded archaeological research beyond the city limits to Pollentia's broader hinterland. These technologies allow the research team to identify areas with potential archaeological remains, detect previously unknown structures, refine interpretations of land use, and analyze historical agricultural practices. By monitoring spectral signatures and vegetation patterns over time, anomalies in vegetation indices can be identified, which helps to delineate potential zones of archaeological interest, and may indicate buried archaeological features too. Additionally, time-series analysis of vegetation dynamics supports the study of current and past land management practices.

This keynote will emphasize the methodological advancements in remote sensing for archaeological research, illustrating their impact through the case study of Pollentia and comparative examples from other Mediterranean sites. It will explore how these techniques are combined with geophysical prospection and other archaeological methods to enhance site documentation, analysis, and preservation. By examining successful implementations of these technologies in various contexts, the presentation will highlight the interdisciplinary nature of modern archaeological research and its contributions to sustainable management.

SPEAKER BIOGRAPHY

Eduard Angelats holds an M.Sc. in Telecommunications Engineering from the Technical University of Catalonia (UPC) and a Ph.D. from the same institution. His research career began in image processing at the Institute of Imaging and Computer Vision (RWTH Aachen University, Germany). In 2009, he joined the former Institute of Geomatics as a research assistant, where he contributed to the development of advanced trajectory determination systems based on robust and hybrid navigation approaches.

Since 2014, he has been a researcher at the Centre Tecnològic de Telecomunicacions de Catalunya (CTTC), where he is part of the Geomatics Research Unit. His work focuses on the development of advanced multi-sensor positioning strategies in GNSS-denied environments, integrating inertial sensors, vision-based techniques, and alternative navigation technologies to enhance accuracy and robustness. He has also worked extensively on sensor fusion methodologies, combining LiDAR and camera data acquired with RPAS (Remotely Piloted Aircraft Systems) and mobile mapping platforms, optimizing both navigation and high-precision 3D reconstruction.

More recently, he has explored the potential of multispectral and hyperspectral imagery from RPAS and Sentinel-2 for improved archaeological documentation, investigating novel remote sensing approaches for the detection of buried or non-superficial archaeological remains. His research also focuses on the use of remote sensing imagery and advanced processing and modeling techniques for water quality estimation and environmental monitoring in applications such as aquaculture, ecosystem management, and coastal zone monitoring.

Beyond his research activities, he has supervised undergraduate and master's theses and is currently co-supervising several Ph.D. students. He is also actively involved in teaching, serving as a lecturer in the master's degree in applications and technologies for Unmanned Aircraft Systems (UPC) and as an invited lecturer in the master's degree in Advanced Studies in Archaeology (University of Barcelona). He is also part of the scientific team studying the Roman and Late Antique city of Pollentia (Mallorca, Spain).

Plenary Session - Friday October 17 - H 11:40



Michelangelo's David and Its Reproduction: Heritage Digital Twin for New Cultural Ecosystems

Prof. Grazia Tucci

*Department of Civil and Environmental Engineering,
University of Florence, Italy*

ABSTRACT

In the contemporary cultural landscape, digitization has emerged as an indispensable resource for studying, preserving, and disseminating cultural heritage. The reproduction of the David for the Dubai Expo was a high-level cultural operation that expanded the concept of a digital resource as the basis for a physical replica. The project integrated technological innovation, multidisciplinary expertise and an advanced vision in the valorisation and dissemination of artistic heritage.

The detailed documentation of the creation process makes it a valuable educational resource, reinforcing Italy's role in the digitisation of cultural heritage. Michelangelo's Digital David is not only an aesthetic and technological icon but also demonstrates how digital twins can redefine the relationship between art and innovation in the contemporary context.

Strongly supported by the Commissioner General for Italy at Expo Dubai 2020, this ambitious initiative was realized under the patronage of MiBACT (the Italian Ministry of Culture), highlighting its cultural significance at both national and international levels.

The digitisation of the David was carried out using state-of-the-art equipment used in industry for inspection and reverse engineering. A structured light fringe scanner was used for high-resolution acquisition, while a tracker scanner was used for drift control. The scans were then processed and optimised into a single model of high accuracy. This technological effort made it possible to capture in detail the marks left by Michelangelo's hand, as well as the delicate colour nuances of the marble texture.

This model was subsequently transformed into a physical replica through cutting-edge 3D printing technologies, ensuring fidelity to the original masterpiece.

The placement of the replica of David at the centre of the Italian Pavilion at Expo 2020 Dubai, coupled with an innovative installation, offered visitors an immersive experience that allowed them to view the statue continuously until they met its gaze. This project has become a symbol of Italy's unparalleled artistic heritage and its constant commitment to technological innovation.

The participation of over 25 million visitors has demonstrated how the digital revolution is transforming people, reshaping communities and offering new perspectives for the enhancement of cultural heritage. This process is not limited to the technological sphere, but requires a paradigm shift to make cultural heritage fully accessible in its physical, digital and cognitive dimensions, strengthening the relationship between the individual, culture and collective memory. This initiative goes beyond the mere reproduction of a masterpiece: it represents a model for cultural sustainability, fostering interdisciplinary collaborations between digital humanities, conservation sciences and artificial intelligence.

SPEAKER BIOGRAPHY

Grazia Tucci is a Full Professor of Geomatics at the University of Florence. She founded the Geomatics Laboratory for the Environment and Cultural Heritage Conservation (GeCO), which focuses on the documentation, conservation, and enhancement of the environment and cultural heritage through innovative technologies.

Since 2022, she has been a member of the board of the National PhD Program in Heritage Science (PhD-HS.it), where she coordinates Curriculum 1: Advanced Materials and Methodologies for the Safeguarding of Cultural Heritage, promoting ecological and digital transitions to mitigate anthropogenic and natural risks.

She is the Coordinator of Spoke 7, "Protection and Conservation of Cultural Heritage from Climate Change, Natural, and Anthropogenic Risks", within the Extended Partnership Initiative CHANGES (Cultural Heritage Active Innovation for Next-Gen Sustainable Society), funded by the National Recovery and Resilience Plan (PNRR).

For the 2024-2027 term, she serves as Vice President of the CIPA Heritage Documentation International Scientific Committee, a joint committee of ICOMOS (International Council of Monuments and Sites) and ISPRS (International Society of Photogrammetry and Remote Sensing).

She is a Board Member of ICOMOS Italy (2023-2025).

She chairs Working Group IV/11 (Technical Commission IV) of ISPRS, dedicated to Cultural Heritage Visualization and Virtual Restoration.

She has held significant roles, including the scientific management of the reproduction of Michelangelo's David for the Italian Pavilion at Expo 2020 Dubai. Additionally, she coordinates the Research and Higher Education Center for the Digitization and Reconstruction of Cultural Heritage and for Artistic and Cultural Production Based on Artificial Intelligence and New Technologies (CHEDAR Project, Legacy Expo 2020 Dubai).

She actively participates in scientific committees and serves on the editorial boards of various book series and journals. Moreover, she contributes as a reviewer for both Italian and international scientific journals.

She is the author of over 250 academic publications.

MetroArcheo 2025 Social Events

WELCOME PARTY

Wednesday October 15 - H 19:30

The MetroArcheo 2025 **Welcome Party** will be held at the Cloister of the Monastery of Sant'Agostino (Conference Venue) on **Wednesday, October 15 - 19:30**.

GALA DINNER

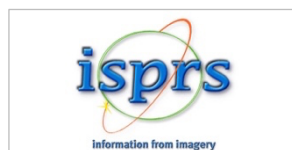
Thursday October 16 - H 20:00

The MetroArcheo 2025 **Gala Dinner** will be held at ***"La Marianna"*** Restaurant on **Thursday, October 16 - 20:00**.

ADDRESS

Ristorante La Marianna
L.go Colle Aperto, 4 - Bergamo

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Program Schedule - Wednesday, October 15

WEDNESDAY - OCTOBER 15			
11:00 - 11:20	OPENING CEREMONY - Conference Hall "Alberto Castoldi"		
	Conference Hall "Alberto Castoldi"	Room 6 - First Floor	Room 7 - First Floor
11:20 - 13:00	S1.1 - SPECIAL SESSION #10: Geomatics for Archaeology and Cultural Heritage: multi-source and multi-scale data integration and processing in research and applications	S1.2 - SPECIAL SESSION #3: Non-destructive imaging and interferometric techniques for cultural heritage diagnostics and metrology	S1.3 - SPECIAL SESSION #8: Integrated Methods, Theories And Applications For Structural Health Monitoring And Assessment Of Ancient Constructions - PART I
13:00 - 14:20	LUNCH		
14:20 - 16:00	S2.1 - SPECIAL SESSION #9: From Composition to Conservation: Advanced Diagnostic Techniques for the Study of Ancient, Modern and Contemporary Painting Surfaces	S2.2 - SPECIAL SESSION #5: How To Preserve Outdoor Cultural Heritage: State-Of-Art, Challenges And New Perspectives	S2.3 - SPECIAL SESSION #8: Integrated Methods, Theories And Applications For Structural Health Monitoring And Assessment Of Ancient Constructions - PART II
16:00 - 16:20	COFFEE BREAK		
16:20 - 16:30	WELCOME ADDRESSES - Aula Magna		
16:30 - 17:00	KEYNOTE SESSION - Aerospace Technologies and Artificial Intelligence for the Protection of Cultural Heritage Lt. Col. Giuseppe Marseglia, Comando Carabinieri Tutela Patrimonio Culturale, Italy		
17:00 - 17:30	KEYNOTE SESSION - The history of the Bergamo irrigation ditches Mario Reduzzi, Consorzio di Bonifica della Media Pianura Bergamasca		
18:00 - 19:15	SOCIAL EVENT - CONCERT - Aula Magna		
19:30	WELCOME PARTY		

Program Schedule - Thursday, October 16

THURSDAY - OCTOBER 16			
	Conference Hall "Alberto Castoldi"	Room 6 - First Floor	Room 7 - First Floor
09:00 - 10:40	S3.1 - SPECIAL SESSION #6: Damage and Radiological Risk Assessment: Diagnosis and Monitoring for the Restoration, Preventive Conservation, Usability and Maintenance of Cultural Heritage	S3.2 - SPECIAL SESSION #4: Chromatic Heritage: Exploring the Science of Pigments, Stones and Art Conservation - PART I	S3.3 - SPECIAL SESSION #21: Multiscale And Multitemporal High Resolution Remote Sensing And Non-Destructive Testing For Archaeology And Monumental Heritage: From Research To Preservation - PART I
10:40 - 11:10	COFFEE BREAK / POSTER SESSION		
11:10 - 11:50	KEYNOTE SESSION - Exploring the Roman city of Pollentia and its Hinterland using multiplatform remote sensing imagery Eduard Angelats, CTTC/CERCA, Spain		
11:50 - 13:10	S4.1 - SPECIAL SESSION #16: Old Solutions for New Problems: Innovative Multitechnical Strategies for Diagnostics on Peculiar Case Studies	S4.2 - SPECIAL SESSION #4: Chromatic Heritage: Exploring the Science of Pigments, Stones and Art Conservation - PART II	S4.3 - SPECIAL SESSION #21: Multiscale And Multitemporal High Resolution Remote Sensing And Non-Destructive Testing For Archaeology And Monumental Heritage: From Research To Preservation - PART II
13:10 - 14:30	LUNCH		
	Conference Hall "Alberto Castoldi"	Room 6 - First Floor	Room 7 - First Floor
14:30 - 16:10	S5.1 - SPECIAL SESSION #1: Monitoring techniques for cultural heritage damage assessment and control	S5.2 - SPECIAL SESSION #14: Advances and innovation in ancient building materials studies: interfacing Archaeology, Science, and Technology	S5.3 - General Session - PART I
16:10 - 16:30	COFFEE BREAK / POSTER SESSION		
16:30 - 17:50	S6.1 - SPECIAL SESSION #11: Archaeobotany and Palynology as Tools for Reconstructing Past Biodiversity, Ecosystems, and Landscapes	S6.2 - General Session - PART II	
20:00	GALA DINNER - La Marianna Restaurant		

Program Schedule - Friday, October 17

FRIDAY - OCTOBER 17			
	Conference Hall "Alberto Castoldi"	Room 6 - First Floor	Room 7 - First Floor
09:30 - 11:10	S7.1 - SPECIAL SESSION #2: Vibroacoustic metrological characterization for archaeology and cultural heritage - PART I	S7.2 - SPECIAL SESSION #15: Virtual environments and Cultural Heritage: tools, new technologies, and future perspectives - PART I	S7.3 - SPECIAL SESSION #19: Advanced Metrological Approaches for the Study and Transmission of Prehistoric Material Culture
11:10 - 11:40	COFFEE BREAK / POSTER SESSION		
11:40 - 12:20	KEYNOTE SESSION - Michelangelo's David and Its Reproduction: Heritage Digital Twin for New Cultural Ecosystems Grazia Tucci, University of Florence, Italy		
12:20 - 13:00	POSTER SESSION		
13:00 - 14:20	LUNCH		
	Conference Hall "Alberto Castoldi"	Room 6 - First Floor	Room 7 - First Floor
14:20 - 15:40	S8.1 - SPECIAL SESSION #2: Vibroacoustic metrological characterization for archaeology and cultural heritage - PART II	S8.2 - SPECIAL SESSION #15: Virtual environments and Cultural Heritage: tools, new technologies, and future perspectives - PART II	Guided tour of the Humanities Library (Biblioteca Umanistica)
16:00 - 16:30	CLOSING AND AWARD CEREMONY		

Technical Program - Wednesday, October 15

09:30 - 18:00	<i>Sant'Agostino - Cloister</i> REGISTRATIONS
11:00 - 11:20	<i>Conference Hall "Alberto Castoldi"</i> OPENING CEREMONY - WELCOME ADDRESSES
11:20 - 13:20	<i>Conference Hall "Alberto Castoldi"</i> Session 1.1 - Geomatics for Archaeology and Cultural Heritage: multi-source and multi-scale data integration and processing in research and applications Chairs: Maria Grazia D'Urso, <i>University of Bergamo, Italy</i> Gabriele Bitelli, <i>University of Bologna, Italy</i>
11:20	Integrated Workflow for 3D modelling of Historic Architecture: A Multi-Sensor Approach Vincenzo Saverio Alfio (Polytechnic University of Bari), Domenica Costantino (Polytechnic University of Bari), Mathab Fallah (Polytechnic University of Turin), Alfredo Restuccia Garofalo (Polytechnic University of Bari), Massimiliano Pepe (University "G. d'Annunzio" of Chieti-Pescara) and Paolo Piumatti (Polytechnic University of Turin)
11:40	UAS-based capacity building for enhancing minor archaeology Joel Aldrighettoni (University of Bergamo) and Maria Grazia D'Urso (University of Bergamo)
12:00	High-Resolution Photogrammetric Survey of a Romanesque Mosaic Floor: A Comparative Analysis of UAS and a Custom-Built Acquisition System Barbara Fazon (Politecnico di Milano), Daniele Treccani (Politecnico di Milano), Andrea Adami (Politecnico di Milano) and Luigi Fregonese (Politecnico di Milano)
12:20	New discoveries at the Castello Sforzesco in Milan: an integrated approach through 3D modelling and GPR survey Maurizio Porcu (Codevintec Italiana s.r.l.), Francesca Biolo (Politecnico di Milano) and Franco Guzzetti (Politecnico di Milano)
12:40	Integrating geomatic high-detail surveying and thermography for the documentation of historical masonry

Anna Forte (Università di Bologna), Francesca Trevisiol (Università di Bologna), Giulia Fiorini (Università di Bologna) and Gabriele Bitelli (Università di Bologna)

13:00 Underground Surveying of the Porticus Minucia as a Basis for the Georeferencing of a Fragment of the Marble Plan of Rome (Forma Urbis Marmorea)

Valerio Baiocchi (Sapienza University of Rome), Alessandri Luca (sapienza Università di Roma), Marta Baumgartner (Soprintendenza speciale Archeologia, Belle Arti e Paesaggio di Roma), Diego Blanco (archeogeos s.r.l.), Alessandro Bosman (CNR IGAG), Andrea Guaglianone (Independent researcher) and Felicia Vatore (Sapienza Università di Roma)

11:20 - 13:20 Room 6 - First Floor

Session 1.2 - Non-destructive imaging and interferometric techniques for cultural heritage diagnostics and metrology

Chairs: Melania Paturzo, *National Research Council, Italy*

Massimo Rippa, *National Research Council, Italy*

Vito Pagliarulo, *National Research Council, Italy*

11:20 Infrared and Terahertz Imaging for the Analysis of a Fresco Sample

Emma Vannini (INO-CNR, University of Florence), Ilaria Catapano (IREA-CNR), Alice Dal Fovo (INO-CNR), Valentina Di Sarno (INO-CNR), Alessandra Rocco (INO-CNR), Pasquale Maddaloni (INO-CNR) and Raffaella Fontana (INO-CNR)

11:40 2D and 3D optical techniques for manuscript analysis: diagnostics based on data integration

Nicole de Manincor (University of Verona), Sara Mazzocato (University of Verona), Dumitru Scutelnic (University of Verona) and Claudia Daffara (University of Verona)

12:00 Shearography and 3D scanning for assessing the strip lining in the case study: Pericles observes Phidias's artwork on the Parthenon, by Gaspare Landi

Chiara Saltarelli (CNR-ISASI), Vito Pagliarulo (CNR-ISASI), Maria Rosaria Vigorito (Suor Orsola Benincasa University) and Melania Paturzo (CNR-ISASI)

12:20 Preliminary Tests of Millimetric Crack Detection in Ancient Wall Paintings using a Terahertz Radar

Fulvia Gennari (Istituto Italiano di Tecnologia), Andrea Campostrini (Istituto Italiano di Tecnologia), Agnese Babini (Istituto Italiano di Tecnologia), Raffaella Lamuraglia (Istituto Italiano di Tecnologia), Giancarlo Ruocco (Istituto Italiano di Tecnologia), Valeria Giliberti (Istituto Italiano di Tecnologia), Arianna Traviglia (Istituto Italiano di Tecnologia) and Michele Ortolani (Istituto Italiano di Tecnologia)

12:40 Multidisciplinary approach of conservation of the fistulae aquariae from the archaeological site of Baiae

Paola Fenelli (University of Studies Suor Orsola Benincasa, Naples), Alessandro De Rosa (University of Studies Suor Orsola Benincasa, Naples), Paola Cennamo (University of Studies Suor Orsola Benincasa, Naples), Giorgio Trojsi (University of Studies Suor Orsola Benincasa, Naples), Massimo Rippa (Institute of Applied Sciences and

Intelligent Systems “E. Caianiello” of CNR, Pozzuoli) and Enrico Gallochio (Ministry of Cultural Heritage and Activities (MIC), Archaeological Park of Campi Flegrei)

13:00 From Europe to the UAE: A Multidisciplinary Approach to Studying Islamic and Arabic Manuscripts on European Papers

Nagmeldeen Hamza (Department of Antiquities and Museums Ras Al Khaimah, United Arab Emirates) and Islam Shaheen (Grand Egyptian Museum)

11:20 - 13:00 *Room 7 - First Floor*

Session 1.3 - Integrated Methods, Theories and Applications For Structural Health Monitoring And Assessment Of Ancient Constructions - PART I

Chairs: Vittorio Paris, *University of Bergamo, Italy*
Pietro Meriggi, *Roma Tre University, Italy*

11:20 STRUCTURAL ASSESSMENT OF THE PROPYLEA CHURCH ARCHAEOLOGICAL REMAINS IN JERASH (JORDAN) USING 3D DISCRETE ELEMENT MODELLING

Florin Cristinel Stan (Roma Tre University), Stefano De Santis (Roma Tre University), Sara Fares (Roma Tre University) and Gianmarco de Felice (Roma Tre University)

11:40 From scan to H-BIM: towards an automated workflow for cultural heritage vulnerability assessment

Pietro Meriggi (Roma Tre University), Antonio Napolitano (Roma Tre University), Alessio Pasquali (Roma Tre University) and Luca Bianchini Ciampoli (Roma Tre University)

12:00 Using GPR to support structural interpretation of collapsed archaeological sites

Roberta Santarelli (Sapienza University of Rome), Alessandra Ten (Sapienza University of Rome), Luca Bianchini Ciampoli (Roma Tre University), Andrea Benedetto (Roma Tre University) and Fabio Tosti (University of West London)

12:20 Digital Twin for Railway Infrastructure and Historic Stations: State of the Art, Technological Architecture, and Development Perspectives

Gianmarco Pireneo (Telematic University Pegaso), Francesco Fabbrocino (Telematic University Pegaso), Carlo Olivieri (Telematic University Pegaso), Andrea Miano (Telematic University Pegaso) and Hamidreza Alavi (University of Cambridge)

12:40 Planning tools for historic centres reconstruction. An overview of Central Italy 2016 earthquake

Margherita Giuffrè (Consiglio Nazionale delle Ricerche) and Francesco Fazzio (Università degli studi di Perugia)

13:20 - 14:20 *Sant'Agostino - Cloister*
LUNCH

14:20 - 15:40	<i>Conference Hall "Alberto Castoldi"</i> Session 2.1 - From Composition to Conservation: Advanced Diagnostic Techniques for the Study of Ancient, Modern and Contemporary Painting Surfaces Chairs: Valeria Comite, <i>University of Milan, Italy</i> Antonino Fiorentino, <i>University of Milan, Italy</i> Francesca Sabatini, <i>University of Milan-Bicocca, Italy</i>
14:20	In situ non-invasive analyses of the painting "Cristo in Trono" (Amalfi, SA, Italy) Antonio Faggiano (University of Salerno), Chiara Gallo (Istemi S.r.l.), Oriana Motta (University of Salerno), Carmine Napoli (Istemi S.r.l.), Eduardo Caliano (Istemi S.r.l.), Antonino Fiorentino (University of Milan), Enza Cobalto (Comune di Amalfi, Assessorato per cultura e beni culturali, eventi e tradizioni), Maria Ricciardi (University of Salerno) and Antonio Proto (University of Salerno)
14:40	Analyzing and studying ancient polychrome surfaces using advanced imaging techniques: Tracing Original Composition to Modern Intervention Islam Shaheen (Sapienza University of Roma - Grand Egyptian Museum), Nagmeldeen Hamza (Grand Egyptian Museum-conservation center) and Mohammed Ragab (Grand Egyptian Museum)
15:00	Characterization of two vases from Centuripe Bianca Irene Carnesale (University of Milan), Giacomo Biondi (CNR, ISPC), Mario Colella (University of Pavia), Federica Giacobello (University of Milan) and Letizia Bonizzoni (University of Milan)
15:20	Spectroscopic Investigation of a 17th-Century Illuminated Parchment from S. Maria di Montalto Church (Messina, Italy) Giuseppe Paladini (University of Messina), Francesco Caridi (University of Messina), Domenico Majolino (University of Messina), Lorenzo Pistorino (University of Messina), Paola Cardiano (University of Messina), Alessandra De Caro (Centro Regionale Progettazione e Restauro e per le Scienze Naturali ed applicate ai beni culturali), Gloria Bonanno (Centro Regionale Progettazione e Restauro e per le Scienze Naturali ed applicate ai beni culturali), Arcangela Valenti (Centro Regionale Progettazione e Restauro e per le Scienze Naturali ed applicate ai beni culturali), Enza Anna Passerini (Centro Regionale Progettazione e Restauro e per le Scienze Naturali ed applicate ai beni culturali), Giuseppe Sampino (Soprintendenza BB.CC.AA) and Valentina Venuti (University of Messina)
14:20 - 16:00	<i>Room 6 - First Floor</i> Session 2.2 - How To Preserve Outdoor Cultural Heritage: State-Of-Art, Challenges and New Perspectives Chairs: Paola Cardiano, <i>University of Messina, Italy</i> Giuseppe Paladini, <i>University of Messina, Italy</i>

- 14:20 Practical solutions to the biodeterioration dilemma: activity of *Dittrichia viscosa* extracts and its specialized metabolites on standard organism *Raphidocelis subcapitata***
Alessandro De Rosa (University of Studies Suor Orsola Benincasa, Naples), Marco Morelli (University of Naples Federico II), Marco Masi (University of Naples Federico II), Alessio Cimmino (University of Naples Federico II), Andrea Carpentieri (University of Naples Federico II), Gaia Marzia Silvestre (University of Naples Federico II), Antonino Pollio (University of Naples Federico II) and Paola Cennamo (University of Studies Suor Orsola Benincasa, Naples)
- 14:40 An integrated approach to the study of the architectural features of the theatre of Tyndaris**
Marco Sfacteria (University of Messina), Stefania Tuccinardi (University of Messina) and Marta Venuti (University of Messina)
- 15:00 In-situ investigation of mortar fragments from the theatre of the archaeological area of Tindari (Sicily, Italy) through DRIFT and μ -Raman techniques**
Giuseppe Paladini (University of Messina), Francesco Caridi (University of Messina), Domenico Majolino (University of Messina), Gabriele Lando (University of Messina), Paola Cardiano (University of Messina) and Valentina Venuti (University of Messina)
- 15:20 Multi-Technique Characterization of Mural Paintings at the Santa Maria Gratia Plena Church in Bruzzano Vetere (Calabria, Southern Italy)**
Lorenzo Pistorino (University of Messina), Francesco Caridi (University of Messina), Giuseppe Paladini (University of Messina), Pasquale Faenza (G. Rohlfs Museum of the Calabrian Greek Language), Domenico Majolino (University of Messina) and Valentina Venuti (University of Messina)
- 15:40 Surface Features of the Giovanni Rasori marble monument (1840, Milan): chemical characterization of degradation and past restoration interventions**
Andrea Bergomi (University of Milan), Paola Fermo (University of Milan), Chiara Andrea Lombardi (University of Milan), Michela Pirovano (Alma Mater Studiorum - Università di Bologna), Antonino Fiorentino (University of Milan), Mattia Borelli (University of Milan), Mario Colella (Università degli Studi di Pavia) and Valeria Comite (University of Milan)

14:20 - 16:00

Room 7 - First Floor

Session 2.3 - Integrated Methods, Theories And Applications For Structural Health Monitoring And Assessment Of Ancient Constructions - PART II

Chairs: Luca Bianchini Ciampoli, *Roma Tre University, Italy*
Iolanda Gaudiosi, *National Research Council, Italy*

- 14:20 Historic centers between reconstruction and recovery. Urban planning considerations on a post-earthquake survey in Amatrice and Accumoli**
Francesco Fazio (University of Perugia)
- 14:40 Remote Sensing for Heritage Conservation and Structural Monitoring: The case of Wolvesey Castle, Winchester**
Efcharis Balodimou (University of West London), Nicoletta Bianchini (University of West London), Tamsin Withers (English Heritage, Engine House), Laden Husamaldin (University of West London), Moein Motavallizadeh Naeini (University of West London), Tesfaye Tessema (University of West London) and Fabio Tosti (University of West London)
- 15:00 Experimental investigation of a masonry arch subjected to an asymmetric concentrated vertical load and validation via static and kinematic limit analysis**
Mario Fagone (University of Florence), Tommaso Rotunno (University of Florence), Natalia Pingaro (Politecnico di Milano) and Gabriele Milani (Politecnico di Milano)
- 15:20 Optimization of CVAE parameters for the damage assessment of historic masonry buildings**
Ivan Roselli (ENEA) and Domenico Palumbo (ENEA)
- 15:40 Time and frequency domain analysis of Etruscan pottery magnified videos**
Vincenzo Fioriti (ENEA), Eugenia Verrigni Petrei Castelli (ENEA), Alessandro Colucci (ENEA) and Ivan Roselli (ENEA)

16:00 - 16:20 Sant'Agostino - Cloister
COFFEE BREAK

16:20 - 16:30 Sant'Agostino - Aula Magna
WELCOME ADDRESSES

16:30 - 17:00 Sant'Agostino - Aula Magna
PLENARY SESSION - KEYNOTE SPEAKER
Chairs: Maria Grazia D'Urso, *University of Bergamo, Italy*
Paola Fermo, *University of Milano, Italy*

Aerospace Technologies and Artificial Intelligence for the Protection of Cultural Heritage

Lt. Col. Giuseppe Marseglia, *Comando Carabinieri Tutela Patrimonio Culturale, Italy*

17:00 - 17:30

Sant'Agostino - Aula Magna

PLENARY SESSION - KEYNOTE SPEAKER

Chairs: Maria Grazia D'Urso, *University of Bergamo, Italy*

Paola Fermo, *University of Milano, Italy*

The history of the Bergamo irrigation ditches

Dr Mario Reduzzi, *Consorzio di Bonifica della Media Pianura Bergamasca*

18:00 - 19:15

Sant'Agostino - Aula Magna

SOCIAL EVENT - CONCERT

19:30

Sant'Agostino - Cloister

WELCOME PARTY

Technical Program - Thursday, October 16

08:30 - 17:00	<i>Sant'Agostino - Cloister</i> REGISTRATIONS
09:00 - 10:40	<i>Conference Hall "Alberto Castoldi"</i> Session 3.1 - Damage and Radiological Risk Assessment: Diagnosis and Monitoring for the Restoration, Preventive Conservation, Usability and Maintenance of Cultural Heritage Chairs: Francesco Caridi, <i>University of Messina, Italy</i> Simona Mancini, <i>University of Salerno, Italy</i>
09:00	Mineralogical Analysis of Viterbo Tuff Using X-Ray Diffraction and Raman Spectroscopy Giuliana Faggio (University Mediterranea of Reggio Calabria), Francesco Caridi (University of Messina), Daniele Chiriu (University of Cagliari), Stefania Da Pelo (University of Cagliari), Michele Guida (University of Salerno), Giacomo Messina (Università Mediterranea di Reggio Calabria), Maurizio Ponte (Università della Calabria), Silvestro Antonio Ruffolo (Università della Calabria), Domenico Majolino (University of Messina) and Valentina Venuti (University of Messina)
09:20	Role of consolidants for limiting the radon exhalation rate in building materials of historical and artistic interest Francesco Caridi (University of Messina), Daniele Chiriu (University of Cagliari), Stefania Da Pelo (University of Cagliari), Giuliana Faggio (Università "Mediterranea" Calabria), Michele Guida (Università degli Studi di Salerno), Giacomo Messina (Università degli Studi di Salerno), Maurizio Ponte (Università della Calabria), Silvestro Antonio Ruffolo (Università della Calabria), Domenico Majolino (University of Messina) and Valentina Venuti (Università degli Studi di Messina)
09:40	Historical urban centers built in tuff and indoor radon exposure Simona Mancini (University of Salerno), Serpil Aközcan Pehlivanoğlu (Kirkklareli University), Natasa Todorovic (University of Novi Sad), Albina Cuomo (C.U.G.RI.), Domenico Guida (C.U.G.RI.) and Michele Guida (University of Salerno)
10:00	Natural radioactivity content, radiological hazard and mineralogy evaluation of Pumice stone from Lipari, Sicily, Southern Italy: a case study Lorenzo Pistorino (University of Messina), Francesco Caridi (University of Messina), Giuseppe Paladini (University of Messina), Antonio Francesco Mottese (Università Mediterranea, Reggio Calabria, Italy), Domenico Majolino (University of Messina) and Valentina Venuti (University of Messina)

10:20 Radon exhalation, natural radioactivity content and radiological hazard assessment for the Viterbo tuff stone: a case study

Francesco Caridi (University of Messina), Daniele Chiriu (University of Cagliari), Stefania Da Pelo (University of Cagliari), Giuliana Faggio ("Mediterranean" University of Reggio Calabria), Michele Guida (University of Salerno), Giacomo Messina ("Mediterranean" University of Reggio Calabria), Maurizio Ponte (University of Calabria), Silvestro Ruffolo (University of Calabria), Domenico Majolino (University of Messina) and Valentina Venuti (University of Messina)

09:00 - 10:30

Room 6 - First Floor

Session 3.2 - Chromatic Heritage: Exploring the Science of Pigments, Stones and Art Conservation - PART I

Chairs: Valentina Mameli, *University of Cagliari, Italy*

Stefania Porcu, *University of Cagliari, Italy*

Stefano Columbu, *University of Cagliari, Italy*

09:00 [INVITED] Natural ultramarine in the Roman context of Volsinii (Bolsena, Italy): a multianalytical characterization

Martina Bernabale (Sapienza University of Rome), Anna Candida Felici (Sapienza University of Rome), Pierfrancesco Atanasio (Sapienza University of Rome), Luca Buccini (Sapienza University of Rome), Daniele Passeri (Sapienza University of Rome), Marco Rossi (Sapienza University of Rome), Paolo Binaco (Museo Territoriale del Lago di Bolsena) and Danilo Dini (Sapienza University of Rome)

09:30 Micro-destructive analyses on Mesolithic and Middle Neolithic artifacts from Su Carroppu (Sardinia, Italy)

Elisa Polletta (University of Cagliari), Valentina Mameli (University of Cagliari), Barbara Melosu (University of Cagliari), Laura Fanti (University of Cagliari) and Carla Cannas (University of Cagliari)

09:50 Intelligent Workflow for Real Time and Automated Analysis of Historical Pigments

Irene Ferrara (Università degli Studi di Catania, Italia), Paola Benedetta Castellino (Università degli Studi di Catania, Italia), Salvatore Gallo (Università degli Studi di Catania, Italia), Anna Maria Gueli (Università degli Studi di Catania, Italia), Giuseppe Politi (Università degli Studi di Catania, Italia) and Giuseppe Stella (Università degli Studi di Catania, Italia)

10:10 3D Fluorescence Mapping: A promising Technique for the Analysis of the Degradation of Pigments

Stefania Porcu (University of Cagliari), Michela Podda (University of Cagliari), Giovanni Brodu (University of Cagliari), Stefano Columbu (University of Cagliari) and Daniele Chiriu (University of Cagliari)

09:00 - 10:40	<i>Room 7 - First Floor</i> Session 3.3 - Multiscale And Multitemporal High Resolution Remote Sensing and Non-Destructive Testing For Archaeology And Monumental Heritage: From Research To Preservation - PART I Chairs: Dora Francesca Barbolla, <i>National Research Council, Italy</i> Lara De Giorgi, <i>National Research Council, Italy</i>
09:00	New results from the GPR surveys at the area surrounding the Basilica at S. Croce in Gerusalemme, (Roma, Italy) Salvatore Piro (ISPC CNR)
09:20	Multidisciplinary approach for the stability analysis of a historical hypogeum in the municipality of Cisternino in the Itria Valley (Puglia, Southern Italy), aimed at a refunctionalization and valorization of the site Maurizio Lazzari (CNR ISPC, Potenza), Davide Palma (Geophysics to GeoEngineering), Pierpaolo Moretti (Geophysics to GeoEngineering) and Valentina Leopizzi (Independent archeologist researcher, Lecce)
09:40	GPR survey at the archaeological site of Heloros (Noto, Sicily) Davide Tanasi (University of South Florida), Rosa Lanteri (Parco archeologico di Siracusa, Eloro, Villa del Tellaro e Akrai), Vincenzo di Fiore (ISPC-CNR), Michele Punzo (ISPC-CNR), Daniela Tarallo (ISPC-CNR), Dora Francesca Barbolla (ISPC-CNR), Lara De Giorgi (ISPC-CNR), Ivan Ferrari (ISPC-CNR), Francesco Giuri (ISPC-CNR) and Giovanni Leucci (ISPC-CNR)
10:00	From Point Clouds to Cultural Landscapes: Open-Source Machine Learning Applications for Archaeological UAV LiDAR segmentation Nicodemo Abate (CNR - ISPC), Antonio Minervino Amodio (CNR - ISPC), Maria Sileo (CNR - ISPC), Rosa Lasaponara (National Research Council - IMAA), Nicola Masini (CNR - ISPC), Gabriele Ciccone (CNR - ISPC) and Alessia Frisetti (CNR - ISPC).
10:20	Discovery and study of “S.S. Egypte” shipwreck using remote sensing techniques, off north harbour of Patras city, Greece George Papatheodorou (University of Patras), Dimitrios Christodoulou (University of Patras), Xenophon Dimas (University of Patras), George Karelak (University of Patras) and Maria Geraga (University of Patras)
10:40 - 11:10	<i>Sant’Agostino - Cloister</i> COFFEE BREAK / POSTER SESSION

11:10 - 11:50 *Aula Magna*
PLENARY SESSION - KEYNOTE SPEAKER
Chairs: Maria Grazia D'Urso, *University of Bergamo, Italy*
 Paola Fermo, *University of Milano, Italy*

Exploring the Roman city of Pollentia and its Hinterland using multiplatform remote sensing imagery

Dr Eduard Angelats, *Centre Tecnològic de Telecomunicacions de Catalunya - CERCA, Spain*

11:50 - 13:30 *Conference Hall "Alberto Castoldi"*
Session 4.1 - Old Solutions for New Problems: Innovative Multitechnical Strategies for Diagnostics on Peculiar Case Studies
Chairs: Alessandro Ciccola, *Sapienza University of Rome, Italy*
 Laura Medeghini, *Sapienza University of Rome, Italy*

- 11:50 Study and characterization of archaeological buildings remains through a non-invasive approach: the AEDIFICIA project**
 Melania Di Fazio (Sapienza Università di Roma), Luca Marinacci (Sapienza Università di Roma), Laura Maria Michetti (Sapienza Università di Roma), Alessandro Conti (Sapienza Università di Roma), Manuela Bonadies (Sapienza Università di Roma), Silvano Mignardi (Sapienza Università di Roma) and Laura Medeghini (Sapienza University of Rome)
- 12:10 A matter of materiality: the use of multi-analytical methods for reinforcing urban heritage**
 Adi Sela Wiener (Bezalel Academy of Arts and Design, Jerusalem), Laura Medeghini (Sapienza University of Rome) and Gabriele Favero (Sapienza University of Rome)
- 12:30 Multi-technique insights into technical variability in Middle Kingdom funerary boat models**
 Nicole Manfreda (University of Rome 'La Sapienza', University of Turin), Paola Buscaglia (Centro Conservazione e Restauro "La Venaria Reale"; Politecnico di Torino), Paolo Del Vesco (Fondazione Museo delle Antichità Egizie di Torino), Francesca Tansella (University of Turin; INFN), Laura Guidorzi (University of Turin; INFN), Marta Magalini (University of Turin; INFN), Alessandro Re (University of Turin; INFN), Tommaso Poli (University of Turin), Chiara Ricci (Centro Conservazione e Restauro "La Venaria Reale", University of Turin,), Matilde Borla (Soprintendenza ABAP-TO) and Alessandro Lo Giudice (University of Turin; INFN)
- 12:50 Exploring the Application of Explainable Neural Networks for the Petrographic Classification of Ceramic Samples from the Levant**
 Sara Capriotti (Sapienza University of Rome), Alessio Devoto (Sapienza University of Rome), Donatella Genovese (Sapienza University of Rome), Silvano Mignardi (Sapienza

University of Rome), Simone Scardapane (Sapienza University of Rome) and Laura Medeghini (Sapienza University of Rome)

13:10 Unlocking the Information Potential of Lake Pigments through SERS and Chemometrics

Adele Bosi (CNR-ISC), Camilla Marola (Sapienza University), Alessandro Ciccola (Sapienza University), Federico Marini (Sapienza University) and Claudia Fasolato (Sapienza University)

11:50 - 13:10

Room 6 - First Floor

Session 4.2 - Chromatic Heritage: Exploring the Science of Pigments, Stones and Art Conservation - PART II

Chairs: Stefania Porcu, *University of Cagliari, Italy*
Valentina Mameli, *University of Cagliari, Italy*
Daniele Chiriu, *University of Cagliari, Italy*

11:50 XRF and Raman Spectroscopic Study of Wall Polychromes in the Saltworks Castle in Wieliczka

Anna Klisińska-Kopacz (National Museum in Krakow), Pamela Grajny-Brzezińska (Cracow Saltworks Museum in Wieliczka), Tomasz Wilkosz (National Museum in Krakow), Michał Obarzanowski (National Museum in Krakow), Klementyna Ochniak-Dudek (Cracow Saltworks Museum in Wieliczka) and Julio M. del Hoyo Meléndez (National Museum in Krakow)

12:10 Quantitative approaches for Fiber Optics Reflectance Spectroscopy (FORS)

Ricardo Pedro Vicente Rojas (Sapienza University of Rome), Silvia Sotgiu (National Central Library of Rome), Véronique Cachia (National Central Library of Rome), Eugenio Delre (Sapienza University of Rome), Nicola Schiavon (Hercules Laboratory, University of Evora, Pal), Mauro Giustini (Sapienza University of Rome) and Mauro Messori (Institute of Complex Systems, CNR)

12:30 Micro-destructive characterization of lithic and ceramic artifacts from the archaeological site of Puistérís (Sardinia)

Alessia Pirrello (Charles University Prague), Valentina Mameli (Università degli studi di Cagliari e INSTM), Barbara Melosu (LASP e Università degli studi di Cagliari), Laura Fanti (LASP e Università degli studi di Cagliari) and Carla Cannas (Università degli studi di Cagliari e INSTM)

12:50 Multi-technique archaeometric investigation of a XVII century illuminated parchment belonging to the S. Maria di Montalto Church (Messina, Italy)

Giuseppe Paladini (University of Messina), Francesco Caridi (University of Messina), Domenico Majolino (University of Messina), Lorenzo Pistorino (University of Messina), Alessandra De Caro (Centro Regionale Progettazione e Restauro e per le Scienze Naturali ed applicate ai beni culturali, Italy), Gloria Bonanno (Centro Regionale Progettazione e Restauro e per le Scienze Naturali ed applicate ai beni culturali, Italy), Arcangela Valenti (Centro Regionale Progettazione e Restauro e per le Scienze Naturali

ed applicate ai beni culturali, Italy), Enza Anna Passerini (Centro Regionale Progettazione e Restauro e per le Scienze Naturali ed applicate ai beni culturali, Italy), Giuseppe Sampino (Soprintendenza BB.CC.AA, Messina, Italy) and Valentina Venuti (University of Messina)

11:50 - 13:10 Room 7 - First Floor

Session 4.3 - Multiscale And Multitemporal High Resolution Remote Sensing And Non-Destructive Testing For Archaeology And Monumental Heritage: From Research To Preservation - PART II

Chairs: Dora Francesca Barbolla, *National Research Council, Italy*
Lara De Giorgi, *National Research Council, Italy*

11:50 Archaeological Remote Sensing at the Villa of Sette Bassi: Vegetation Index Analysis with Pléiades Neo Imagery

Jessica Clementi (Sapienza University of Rome), Veronica Sanvito (Sapienza University of Rome), Stefano Roascio (Ministero della Cultura, Parco Archeologico dell'Appia Antica), Michele Reginaldi (Ministero della Cultura, Parco Archeologico dell'Appia Antica) and Paolo Mazzanti (Sapienza University of Rome)

12:10 Can Vandalism Reshape the Way We Perceive Cultural Heritage?

Fabrizio Terenzio Gizzi (CNR-ISPC), Cristina Cumbo (CNR-ISPC), Maria Rosaria Potenza (CNR-ISPC), Agata Maggio (CNR-ISPC), Antonio Minervino Amodio (CNR-ISPC) and Canio Alfieri Sabia (CNR-ISPC)

12:30 ERT geophysical survey for Landslide Risk Management in Coastal Areas: Case Studies of Brovinje and Havišće (Croatia)

Michele Punzo (ISPC-CNR), Dora Francesca Barbolla (ISPC-CNR), Giuseppe Cavuoto (ISPC-CNR), Vincenzo Di Fiore (ISPC-CNR), Daniela Tarallo (ISPC-CNR) and Giovanni Leucci (National Research Council).

12:50 Water leaks as a hidden risk to cultural heritage sites: application of the TEAMWIRE project and the geophysical challenges

Chiara Torre (University of Malta), Sebastiano D'Amico (University of Malta), Emanuele Colica (University of Malta), Julian Mamo (University of Malta), Lara De Giorgi (CNR-ISPC), Dora Francesca Barbolla (CNR-ISPC) and Giovanni Leucci (CNR-ISPC)

13:10 - 14:30 Sant'Agostino - Cloister

LUNCH / POSTER SESSION

14:30 - 16:10 Conference Hall "Alberto Castoldi"

Session 5.1 - Monitoring techniques for cultural heritage damage assessment and control

Chairs: Jessica Clementi, *Sapienza University of Rome, Italy*
Alessandra Bonazza, *National Research Council, Italy*

- 14:30 EO-based products for risk assessment of cultural and natural heritage against climate and pollution impact**
Alessandro Sardella (CNR-ISAC), Ramiro Marco Figuera (SISTEMA GmbH), Stefano Natali (SISTEMA GmbH) and Alessandra Bonazza (CNR-ISAC)
- 14:50 Environmental monitoring of The Grotto of the Animals: a case study for the SENNSE IoT platform**
Francesco Taurino (CNR - ISPC), Irene Muci (Università La Sapienza), Davide Zecca (CNR - ISPC), Cristiano Riminesi (CNR - ISPC), Grazia Tucci (Unifi, Firenze - Italia) and Alberto Bucciero (CNR - ISPC)
- 15:10 From Thermal Signatures to Conservation Insights: A Fixed Camera Network Approach for Heritage Structure Health Monitoring**
Giandomenico Mastrantoni (Sapienza University of Rome), Jessica Clementi (Sapienza University of Rome), Antonio Molinari (Sapienza University of Rome), Ioannis Farmakis (Sapienza University of Rome) and Paolo Mazzanti (Sapienza University of Rome)
- 15:30 Multi-scale non-invasive techniques for assessing instability conditions: examples from the Val di Cornia parks system (Tuscany, Italy)**
Tommaso Beni (University of Florence), Silvia Guideri (Parchi Val di Cornia S.p.A), Debora Brocchini (Parchi Val di Cornia S.p.A), Marta Cocoluto (Parchi Val di Cornia S.p.A), Diletta Borselli (University of Florence), Lorenzo Bonechi (National Institute for Nuclear Physics INFN), Sandro Gonzi (University of Florence), Irene Centauro (University of Florence), Anna Palamidessi (University of Florence), Vitaliano Ciulli (University of Florence), Raffaello D'Alessandro (University of Florence), Giovanni Gigli (University of Florence), Deodato Tapete (Italian Space Agency ASI), Veronica Tofani (University of Florence) and Silvia Bianchini (University of Florence)
- 15:50 Application of Digital Photogrammetry in Damage Mapping on Facades of Historical Buildings**
Tallis Rubens (Universidade de São Paulo), Fabiana Oliveira (Universidade de São Paulo), Fabricio Costa (Oregon State University), Luciana Toledo (Pontifícia Universidade Católica de Campinas) and Ana Elisabete Jacintho (Pontifícia Universidade Católica de Campinas)

14:30 - 15:50 *Room 6 - First Floor*
Session 5.2 - Advances and innovation in ancient building materials studies: interfacing Archaeology, Science, and Technology
Chairs: Mirco Ramacciotti, *University of Valencia, Spain*
Stefano Columbu, *University of Cagliari, Italy*
Stefania Porcu, *University of Cagliari, Italy*
Valentina Mameli, *University of Cagliari, Italy*

- 14:30 Geophysical Survey in the Presbytery of Tarragona Cathedral**
Albert Casas (Universitat de Barcelona)

- 14:50 València la Vella (Spain) and Late Antique Mortars: A Regional Geochemical Approach**
Manel Górriz I Villar (Universitat de València), Mirco Ramacciotti (Universitat de València), Iván Pérez Torralba (University of Valencia), Angel Morales Rubio (University of Valencia), Iván Fumadó-Ortega (Universitat de València), José María Macías Solé (Catalan Institute of Classical Archaeology), Albert Ribera (Catalan Institute of Classical Archaeology) and Gianni Gallelo (Universitat de València)
- 15:10 Multi-Technique Characterization of Mortars from Gammarth Villa (Tunisia)**
Manel Górriz I Villar (Universitat de València), Mirco Ramacciotti (Universitat de València), Iván Fumadó Ortega (Universitat de València), Hamden Ben Romdhane (Institut National du Patrimoine, Tunis, Tunisia.), Angel Morales Rubio (University of Valencia) and Gianni Gallelo (University of Valencia)
- 15:30 XRD and PCA analysis of historic mortars from the Venetian Fortress of Bergamo (Italy)**
Renato Pelosato (Università degli Studi di Bergamo), Isabella Natali Sora (Università degli Studi di Bergamo), Virna Maria Nannei (Università degli Studi di Bergamo) and Giulio Mirabella Roberti (Università degli Studi di Bergamo)
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- 14:30 - 16:10 Room 7 - First Floor*
Session 5.3 - General Session - PART I
Chairs: Joel Aldrighettoni, *University of Bergamo, Italy*
Vittorio Paris, *University of Bergamo, Italy*
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- 14:30 The Advent of Complex Metallurgy**
Yuval Goren (Ben-Gurion University of the Negev), Yotam Asscher (University of Haifa), Sarel Shalev (University of Haifa) and Danny Rosenberg (University of Haifa)
- 14:50 Characterization of Early 20th Century Measurement Instruments: A Heritage Approach**
Emma Angelini (Politecnico di Torino), Margherita Bongiovanni (Politecnico Torino), Leila Es Sebar (Politecnico di Torino) and Federico Di Iorio (Fondazione Centro per la Conservazione ed il restauro dei Beni Culturali (La Venaria Reale))
- 15:10 Preliminary Investigation into pre-Industrial Salt Production: an experimental approach**
Martina Sciortino (University of Trento), Alessia Santiglia (University of Milan), Monica Azzarone (University of Milan), Laura Magnano (University Cattolica), Giorgio Baratti (University Cattolica), Laura Santagostini (University of Milan) and Vittoria Guglielmi (University of Milan).
- 15:30 Preserving the Past with Gamma Rays: Real Case Studies from the Montecassino Abbey Collection**
Beatrice D'Orsi (ENEA), Rocco Carcione (ENEA), Ilaria Di Sarcina (ENEA), Jessica Scifo (ENEA), Teresa Rinaldi (Sapienza University of Rome), Nicola Tangari (University of Cassino and Southern Lazio) and Alessia Cemmi (ENEA)

- 15:50 Assessing material compatibility for restoration: An innovative approach to compare hydraulic properties of repair and historic mortars**
 Salvatore Menta (University of Catania), Antonio Strosco (University of Catania), Gaetano Ortolano (University of Catania), Roberto Visalli (University of Catania) and Cristina Maria Belfiore (University of Catania)

16:10 - 16:30 Sant'Agostino - Cloister
COFFEE BREAK / POSTER SESSION

16:30 - 17:50 Conference Hall "Alberto Castoldi"
Session 6.1 - Archaeobotany and Palynology as Tools for Reconstructing Past Biodiversity, Ecosystems, and Landscapes
Chairs: Eleonora Clò, *University of Modena and Reggio Emilia, Italy*
 Claudia Moricca, *Sapienza University of Rome, Italy*
 Cristiano Vignola, *Sapienza University of Rome, Italy*

- 16:30 Natural vs anthropogenic constraints address changes of plant biodiversity in Italy during the Holocene**
 Cristiano Vignola (Sapienza University of Rome), Alessia Masi (Sapienza University of Rome) and Laura Sadori (Sapienza University of Rome)
- 16:50 The Long-Term Human-Mediated Success of Olive Trees in the Central Mediterranean: A Multiproxy Perspective**
 Laura Sadori (Sapienza University of Rome), Jordan Palli (University of Tuscia, Viterbo), Sabina Fiolna (Freie Universität of Berlin), Monica Bini (University of Pisa), Federico Cappella (Sapienza University of Rome), Adam Izdebski (Max Planck Institute, Jena, Germany, Jagiellonian University in Krakow, Poland, University of Warsaw, Poland), Alessia Masi (Sapienza University of Rome), Scott Mensing (University of Nevada, Reno), Lorenzo Nigro (Sapienza University of Rome), Gianluca Piovesan (University of Tuscia, Viterbo) and Giovanni Zanchetta (University of Pisa)
- 17:10 Measuring Millennial Biodiversity with Pollen: Archaeo-Data from Southern Italy**
 Eleonora Clò (University of Modena and Reggio Emilia), Anna Maria Mercuri (University of Modena and Reggio Emilia), Jessica Zappa (University of Modena and Reggio Emilia), Cristina Ricucci (University of Modena and Reggio Emilia), Lorenzo Braga (University of Modena and Reggio Emilia) and Assunta Florenzano (University of Modena and Reggio Emilia)
- 17:30 ARBOREA – A new georeferenced database for plant macro-remains from archaeological sites in Central Italy**
 Claudia Moricca (Sapienza University of Rome), Erasmo Di Fonso (Sapienza University of Rome), Rachele Nicolini (Sapienza University of Rome) and Laura Sadori (Sapienza University of Rome)

16:30 - 18:10

Room 6 - First Floor

Session 6.2 - General Session - PART II

Chairs: Joel Aldrighettoni, *University of Bergamo, Italy*

Fabio Leccese, *Roma Tre University, Italy*

16:30 Biofilms on limestones specimens: laboratory tests implementing a non-destructive approach

Davide Ripamonti (Università degli Studi di Milano), Emanuele Frabasile (Università Degli Studi di Milano), Alessia Marzanni (Università di Bolzano), Chao Gao (Norwegian University of Science and Technology), Chiara Bertolin (Norwegian University of Science and Technology), Villa Federica (Università degli Studi di Milano) and Nicola Gherardo Ludwig (Università degli Studi di Milano)

16:50 Multi-technical non-invasive analysis to prevent deterioration in varnish-coated oil-paintings

Alice Dal Fovo (Istituto Nazionale di Ottica, CNR), Laura Maestro-Guijarro (Instituto de Química Física Blas Cabrera, CSIC), Paula Maria Carmona-Quiroga (Instituto de Ciencias de la Construcción Eduardo Torroja, CSIC), Raffaella Fontana (Istituto Nazionale di Ottica, CNR), Francesca Rosi (Istituto di Scienze e Tecnologie Chimiche, CNR), Martina Alunni Cardinali (ISTC-CNR, Perugia, Italy; Università di Perugia, Italy), Aldo Romani (Università di Perugia, Italy), Lucia Comez (Istituto Officina dei Materiali, CNR), Cristiano Riminesi (Istituto di Scienza del Patrimonio Culturale, CNR), Magdalena Iwanicka (Faculty of Fine Arts, Nicolaus Copernicus University in Toruń, Poland), Piotr Targowski (Institute of Physics, Faculty of Physics, Astronomy and Informatics, Nicolaus Copernicus University in Toruń, Poland), Magdalena Kowalska (Nicolaus Copernicus University in Toruń, Poland), Aggelos Philippidis (Institute of Electronic Structure and Laser, FORTH, Heraklion, Crete, Greece), Paraskevi Pouli (Institute of Electronic Structure and Laser, FORTH, Heraklion, Crete, Greece), Marta Castillejo (Instituto de Química Física Blas Cabrera, CSIC) and Mohamed Oujja (Instituto de Química Física Blas Cabrera, CSIC)

17:10 Mediterranean eustatic and climatic variations vs the Phoenician-Punic settlement/abandonment phases

Alessandro Paladini (Independent archeologist researcher) and Maurizio Lazzari (CNR ISPC, Potenza)

17:30 Evolution of anthropic coastal landscapes and ground deformation in the Campi Flegrei caldera (southern Italy) since Roman times: insights from multi-technique surveys

Claudia Caporizzo (Università Telematica Pegaso), Gaia Mattei (Università degli Studi di Napoli Parthenope), Pietro P.C. Aucelli (Università degli Studi di Napoli Parthenope) and Gerardo Pappone (Università degli Studi di Napoli Parthenope)

17:50 APPLICATION OF PARTICLE IMAGE VELOCIMETRY (PIV) TO DETECT THERMALLY-INDUCED AIRFLOWS IN ARTWORK DISPLAY CASES

Barbara Marchetti (Università degli Studi eCampus), Matteo Moglie (Università degli Studi eCampus) and Francesco Corvaro (Università Politecnica delle Marche)

20:00	<i>Restaurant "La Marianna" - L.go Colle Aperto, 4 - Bergamo</i> GALA DINNER
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Technical Program - Friday, October 17

09:00 - 13:00	<i>Sant'Agostino - Cloister</i> REGISTRATIONS
09:30 - 11:10	<i>Conference Hall "Alberto Castoldi"</i> Session 7.1 - Vibroacoustic metrological characterization for archaeology and cultural heritage - PART I Chairs: Fabrizio Barone, <i>University of Salerno, Italy</i> Marco Casazza, <i>University of Salerno, Italy</i>
09:30	Minimization of environmental acoustic effects: an intangible design element of Greek theatres Fabrizio Barone (University of Salerno) and Marco Casazza (University of Salerno)
09:50	Vibroacoustic landscape and defensive network: metrology for the characterization of potential communication systems in Medieval Basilicata until the Longobard-Norman transition Rosa Fiorillo (University of Salerno), Marco Casazza (University of Salerno) and Fabrizio Barone (University of Salerno)
10:10	The Sound Emission of the Bell Tower of the Salerno Cathedral in Medieval Europe between Architectural Structure and Bell Construction Techniques Fabrizio Barone (University of Salerno), Rosa Fiorillo (University of Salerno) and Marco Casazza (University of Salerno)
10:30	A Case Study of Road Traffic Noise Intrusion Simulation in an Italian Archaeological Site Claudio Guarnaccia (University of Salerno), Aurora Mascolo (University of Salerno) and Domenico Rossi (University of Salerno)
10:50	The Roman Bridge on the Savuto River: understanding its dynamical structural behavior through the adaptive DFEM method Fabrizio Barone (University of Salerno), Salvatore Antonio Fornaro (Studio di Architettura Fornaro), Armando Di Maio (Studio di Architettura Di Maio, Napoli, Italy) and Marco Casazza (University of Salerno)
09:30 - 11:10	<i>Room 6 - First Floor</i> Session 7.2 - Virtual environments and Cultural Heritage: tools, new technologies, and future perspectives - PART I Chairs: Angelo Lorusso, <i>University of Salerno, Italy</i> Michele Pellegrino, <i>University of Salerno, Italy</i> Domenico Santaniello, <i>University of Salerno, Italy</i>

- 09:30 Gradient-Based Analysis of Vertical Displacements in Urban 3D LiDAR Models Using SAR Data**
Alessandro Di Benedetto (University of Salerno), Margherita Fiani (University of Salerno) and Salvatore Barba (University of Salerno)
- 09:50 Cultural Heritage visualization through Generative AI: a Unity-based plugin for real-time 3D object creation**
Attilio Della Greca (University of Salerno), Ilaria Amaro (University of Salerno), Giovanni Nocerino (University of Naples Federico II) and Paola Barra (Parthenope University of Naples)
- 10:10 Federated Digital Twins and XR for Cultural Heritage: A Collaborative Framework**
Gizealew Alazie Dagnaw (University of L'Aquila) and Henry Muccini (University of L'Aquila)
- 10:30 Mobile games for the Revival of Archeological Parks in Campania: A Pilot Experience Bridging Virtual Environments and Cultural Heritage**
Francesco Colace (University of Salerno), Constanza Fiorella Duarte Petti (Universidad abierta Interamericana), Angelo Lorusso (University of Salerno), Michele Pellegrino (University of Salerno) and Domenico Santaniello (University of Salerno)
- 10:50 Towards an Operational Protocol for Virtual Tours in Complex Cultural Sites: The Norman Castle of Aci Castello**
Paolino Trapani (University of Catania), Eleonora Pappalardo (University of Catania), Anna M. Gueli (University of Catania) and Filippo Stanco (University of Catania)

09:30 - 11:10 *Room 7 - First Floor*

Session 7.3 - Advanced Metrological Approaches for the Study and Transmission of Prehistoric Material Culture

Chairs: Dario Calderone, *Ludwig Maximilian University of Munich, Germany*
Paolino Trapani, *University of Catania, Italy*

- 09:30 High-Resolution 3D Digitization and Analysis of the Mesolithic Site of Latnija (Malta)**
Davide Tanasi (University of South Florida), Alex Fawbush (University of South Florida), Kaitlyn Kingsland (University of South Florida), Dario Calderone (LMU-Munich), Eleanor Scerri (Max Planck Institute of Geoanthropology), Nicholas Vella (University of Malta) and Huw Groucutt (University of Malta)
- 09:50 Preliminary Results of the Integrated 3D Digitization of the Prehistoric Artifacts Exhibited at the Museum of Archaeology of the University of Catania**
Paolino Trapani (University of Catania), Marianna Figuera (University of Catania), Simona V. Todaro (University of Catania), Anna M. Gueli (University of Catania) and Filippo Stanco (University of Catania)
- 10:10 Colourant pigments used for pottery decoration in Northeastern Africa during the Neolithic period: An analysis using Raman spectroscopy and Microscopy**
Sakura Sanada (Tokyo Metropolitan University, Graduate School of Humanities)

- 10:30 RTI and virtualRTI: tools and methodologies for documenting prehistoric engraved artifacts**
Angelo Lorusso (University of Salerno), Michele Pellegrino (University of Salerno), Domenico Santaniello (University of Salerno) and Francesco Colace (University of Salerno)
- 10:50 Digital Strategies for the Protection and Valorization of Prehistoric Landscapes: 3D Metrology at Cozzo del Pantano (Sicily)**
Davide Tanasi (University of South Florida), Alew Fawbush (University of South Florida), Stephan Hassam (Randolph Macon College) and Dario Calderone (LMU-Munich)

11:10 - 11:40 *Sant'Agostino - Cloister*
COFFEE BREAK / POSTER SESSION

11:40 - 12:20 *Aula Magna*
PLENARY SESSION - KEYNOTE SPEAKER
Chairs: Maria Grazia D'Urso, *University of Bergamo, Italy*
Paola Fermo, *University of Milano, Italy*

Michelangelo's David and Its Reproduction: Heritage Digital Twin for New Cultural Ecosystems

Prof. Grazia Tucci, *University of Florence, Italy*

12:20 - 13:00 *Sant'Agostino - Cloister*
POSTER SESSION

13:00 - 14:20 *Sant'Agostino - Cloister*
LUNCH / POSTER SESSION

14:30 **Guided tour of the Humanities Library (Biblioteca Umanistica)**
Guided by Prof. Stefano Morosini of the Department of Foreign Languages, Literatures and Cultures, University of Bergamo

14:20 - 15:40 *Conference Hall "Alberto Castoldi"*
Session 8.1 - Vibroacoustic metrological characterization for archaeology and cultural heritage - PART II
Chairs: Fabrizio Barone, *University of Salerno, Italy*
Marco Casazza, *University of Salerno, Italy*

- 14:20 Geometry of a Medieval Town in the Context of Political Religious Governance of the Territory**
Fabrizio Barone (University of Salerno), Rosa Fiorillo (Università di Salerno), Armando Di Maio (Studio di Architettura Di Maio, Napoli, Italy) and Marco Casazza (University of Salerno)
- 14:40 Non-invasive dating of historical church bells through vibroacoustic matching of musical temperaments**
Marco Casazza (University of Salerno), Rosa Fiorillo (University of Salerno) and Fabrizio Barone (University of Salerno)
- 15:00 A new protocol for the reconstruction of the auditory ambiance in Palaeolithic sites: first results from Grotta Paglicci (Apulia – Southern Italy)**
Jacopo Crezzini (University of Siena), Adriano Farina (University of Bologna), Enrico Armelloni (University of Parma), Riccardo Salvini (University of Siena), Annamaria Ronchitelli (University of Siena), Stefano Ricci (University of Siena) and Francesco Boschin (University of Siena)
- 15:20 Sensorial identity of ruins: Vibroacoustic features of the roofless medieval Chapel of Madonna del Fieno (Fisciano, Italy)**
Elide Nastri (University of Salerno) and Paolo Todisco (University of Salerno)

14:20 - 16:00

Room 6 - First Floor

Session 8.2 - Virtual environments and Cultural Heritage: tools, new technologies, and future perspectives - PART II

Chairs: Angelo Lorusso, *University of Salerno, Italy*

Michele Pellegrino, *University of Salerno, Italy*

Domenico Santaniello, *University of Salerno, Italy*

- 14:20 Virtual Reconstruction of the Temple of Olympian Zeus in Syracuse: A Journey in the Metaverse between History and Technology**
Nicolò Di Marco (University of Catania), Elvia Maria Letizia Giudice (University of Catania) and Filippo Stanco (University of Catania)
- 14:40 Hidden Monuments Revealed: 3D Digitization of the Benedictine Monastery of Catania and its Stratified Spaces**
Simone Pio Barbagallo (University of Catania), Maura Fugazzotto (University of Catania), Lucrezia Longhitano (University of Catania), Roberta Occhipinti (University of Catania), Dario Allegra (University of Catania), Germana Barone (University of Catania), Paolo Mazzoleni (University of Catania) and Filippo Stanco (University of Catania)
- 15:00 Adaptive Immersive Experiences: Comparative Study on Villa Regina**
Liliana Cecere (University of Salerno), Francesco Colace (University of Salerno), Muhammad Khan (University of the West of England), Angelo Lorusso (University of Salerno), Domenico Santaniello (University of Salerno) and Carmine Valentino (University of Salerno)

15:20 Gamified AR and supervised AI for Cultural Heritage: The Amiternum Site Experience

Federico Martusciello (Università degli Studi dell'Aquila), Henry Muccini (Università degli Studi dell'Aquila) and Alfonso Forgione (Università degli Studi dell'Aquila)

15:40 From Surveying Techniques to a 3D GIS Geodatabase

Barbara Marana (University of Bergamo) and Giorgio Ubbiali (Diemme Strumenti)

16:00 - 16:30 Conference Hall "Alberto Castoldi"
CLOSING AND AWARD CEREMONY

LIST OF POSTERS

All posters will be displayed simultaneously during the time slots indicated in the program as "Poster Session".

- PS01 How do climate change-driven renewable energy infrastructures affect the visual perception of landscapes? An exploratory empirical study**
Canio Alfieri Sabia (CNR ISPC), Maria Rosaria Potenza (CNR ISPC), Agata Maggio (CNR ISPC), Antonio Minervino Amodio (CNR ISPC) and Fabrizio Trenzio Gizzi (CNR ISPC)
- PS02 Implementation of Management Facilitators in Historic Buildings: Integration of BIM and GIS for Pathology Monitoring**
Crislandy Kaline Barreiro Marques (Universidade Estadual de Campinas), Rafael Fernandes Dionízio (Universidade Estadual de Campinas) and Eloísa Dezen Kempter (Universidade Estadual de Campinas)
- PS03 Tracing Construction Phases at the Roman Villa Horta da Torre (Fronteira, Portugal): Insights from mortars aggregates**
Mizuki Takahashi (University of Évora), Cristina Galacho (University of Évora), André Carneiro (University of Évora) and Patricia Moita (University of Évora)
- PS04 Walls of the Castle of Alcácer do Sal – Contribution to the Study of Mortars in Military Architecture**
Maria Almeida (University of Évora), Maria Pinheiro-Alves (University of Évora), Patrícia Moita (University of Évora) and Cristina Galacho (University of Évora)
- PS05 Protecting the Past, Shaping the Future. High School Students Test Nanocomposites on Archaeological samples**
Beatrice Calosso (ENEA), Rosaria D'Amato (ENEA), Valentina Nigro (ENEA) and Gaetano Terranova (ENEA)
- PS06 An integrated approach for the systematic monitoring of the indoor air quality and microclimatology at churches located in the Central Mediterranean region**
Antonio Proto (University of Salerno), Francesca Cannizzaro (University of Messina), Maria Ricciardi (University of Salerno), Maria Letizia Amadori (University of Urbino), Jgor Arduini (University of Urbino), Oriana Motta (University of Salerno), Paola Donato (University of Messina), Alfred Micallef (University of Malta), Sebastiano D'Amico (University of Malta), Adriana Alescio (St John's Foundation), Luigi Mondello (University of Messina) and Danilo Sciarrone (University of Messina)
- PS07 Application of 3D Ultrasonic Tomography in Cultural Heritage: The Case of the Ustica Sculpture**
Alessandra Carollo (University of Palermo), Patrizia Capizzi (University of Palermo), Raffaele Martorana (University of Palermo), Marco Vincenzo Majani (University of Palermo) and Franco Foresta Martin (National Institute of Geophysics and Volcanology)

- PS08 Integrated Geophysical Prospection at the Roman Villa of Agosta (Comacchio, Italy): first results**
Jessica Clementi (Sapienza Università di Roma) and Enzo Rizzo (Università di Ferrara)
- PS09 Micro-geophysical investigations for structural diagnostics at Coratelli Mill**
Lara De Giorgi (ISPC-CNR), Dora Francesca Barbolla (ISPC-CNR) and Giovanni Leucci (ISPC-CNR)
- PS10 ERT surveys at the Necropolis of Baucina (Palermo)**
Lara De Giorgi (ISPC-CNR), Dora Francesca Barbolla (ISPC-CNR) and Giovanni Leucci (ISPC-CNR)
- PS11 Virtual reconstruction of the Ducal Palace of Oliveto Lucano (Basilicata, Italy)**
Maurizio Delli Santi (ISPC-CNR) and Massimiliano Passarelli (CNR - NANOTEC)
- PS12 Post-earthquake structural assessment using Ground Penetrating Radar (GPR): preliminary insight for guidelines from literature review**
Antonio Minervino Amodio (Institute of Heritage Science (ISPC)), Giovanni Leucci (Institute of Heritage Science (ISPC)) and Fabrizio Terenzio Gizzi (Institute of Heritage Science (ISPC))
- PS13 Fragility curves for reinforced concrete old buildings in Cuba**
Kenia Mercedes Leyva Chang (Centro Nacional de Investigaciones Sismológicas (CENAIIS)) and Grisel Morejon Blanco (Centro Nacional de Investigaciones Sismológicas (CENAIIS))
- PS14 Dust Detector for Museum Environment Based on Raspberry-Pi**
Mariagrazia Leccisi (Università degli Studi Roma Tre), Giuseppe Schirripa Spagnolo (Università degli Studi Roma Tre) and Fabio Leccese (Università degli Studi Roma Tre)
- PS15 The Theatre of Marcellus: between historical memory and digital innovation**
Roberto Barni (Sapienza Università di Roma), Marika Griffo (Sapienza Università di Roma), Carlo Inglese (Sapienza Università di Roma) and Simone Lucchetti (Sapienza Università di Roma)
- PS16 Reconstructing Galileo's Inclined Plane Experiments: Problems of Time Measurements.**
Giuseppe Schirripa Spagnolo (Università Roma Tre), Giorgia Satta (Università degli Studi Roma Tre), Federico Fina (Università degli Studi Roma Tre), Ilaria De Angelis (Università degli Studi Roma Tre) and Fabio Leccese (Università degli Studi Roma Tre)
- PS17 Analysis of hypogea environments based on ambient vibration data: application to a case study on the Palatine hill**
Iolanda Gaudiosi (Consiglio Nazionale delle Ricerche), Maurizio Simionato (Consiglio Nazionale delle Ricerche), Daniel Tentori (Consiglio Nazionale delle Ricerche), Michele Livani (Consiglio Nazionale delle Ricerche), Salvatore Piro (Consiglio Nazionale delle Ricerche), Marco Mancini (Consiglio Nazionale delle Ricerche), Francesco Stigliano (Consiglio Nazionale delle Ricerche) and Massimiliano Moscatelli (Consiglio Nazionale delle Ricerche).

- PS18 Historic Roofless Masonry Structures: The role of Environmental Factors that Contribute to Decay and Collapse**
Nicoletta Bianchini (University of West London), Efcharis Balodimou (University of West London), Tesfaye Tessema (University of West London), Laden Husamaldin (University of West London) and Fabio Tosti (University of West London)
- PS19 Augmented Reality for Knowledge Transfer of Historical Masonry Vaulting Techniques**
Davide Prati (University of Bergamo), Orsolya Gaspar (Penn State University) and Vittorio Paris (University of Bergamo)
- PS20 Structural Investigation through Digital Modeling of Two Domes by Ferdinando Crivelli**
Virna Maria Nannei (University of Bergamo), Vittorio Paris (University of Bergamo), Davide Prati (University of Bergamo), Monica Resmini (University of Bergamo) and Giulio Mirabella Roberti (University of Bergamo)
- PS21 Multitemporal SAR data for prospection, monitoring and preservation of Cultural Heritage**
Antonio Corbo (Sapienza University of Rome), Antonio Napolitano (Sapienza University of Rome, Roma Tre University), Deodato Tapete (Italian Space Agency), Andrea Benedetto (Roma Tre University) and Alessandro Jaia (Sapienza University of Rome)
- PS22 Chemical degradation and mineralogical transformations on based lime blue pigment**
Stefano Columbu (Cagliari University), Giovanni Brodu (Cagliari University), Stefania Porcu (Cagliari University), Daniele Chiriu (Cagliari University) and Giuliana Fenu (Restorer in Cultural Heritage)
- PS23 Mineralogical and petrographic analyses of a complex finishing plasters stratigraphy from a 17th century Sardinian Church**
Stefano Columbu (Cagliari University), Giovanni Brodu (Cagliari University), Daniele Chiriu (Cagliari University), Stefania Porcu (Cagliari University) and Giuliana Fenu (Restorer in Cultural Heritage)
- PS24 Spectroscopic and Micro-Elemental Analysis of some 20th-Century Paintings: Identifying Diagnostic Pigments**
Andrea Bergomi (Università degli Studi di Milano), Valeria Comite (Università degli Studi di Milano), Chiara Andrea Lombardi (Università degli Studi di Milano), Mattia Borelli (Università degli Studi di Milano), Giulia Galli (Università degli Studi di Milano), Gianluca Carabelli (Università degli Studi di Milano), Paola Fermo (Università degli Studi di Milano) and Antonino Fiorentino (Università degli Studi di Milano)
- PS25 Optical methods for violin diagnostic**
Vito Pagliarulo (CNR-ISASI), Massimo Rippa (CNR-ISASI), Chiara Saltarelli (CNR-ISASI), Antimo Di Meo (CNR-ISASI), Dimitru Scutelnic (Dept. of Computer Science, University

of Verona), Claudia Daffara (Dept. of Computer Science, University of Verona) and Melania Paturzo (CNR-ISASI)

PS26 Active Thermography Analysis of Wall Paintings in the Early Christian Basilica Complex of Cimitile (Italy)

Antimo Di Meo (Institute of Applied Sciences and Intelligent Systems “E. Caianiello” of CNR, Pozzuoli (Na), Italy.), Maria Palma Recchia (Superintendency for Archaeology, Fine Arts and Landscape for the Metropolitan Area of Naples, Italy.) and Massimo Rippa (Institute of Applied Sciences and Intelligent Systems “E. Caianiello” of CNR, Pozzuoli (Na), Italy.)

PS27 3D modelling for the historical reconstruction of an archaeological site: the temple of Iuvanum

Vincenzo Saverio Alfio (Polytechnic University of Bari), Domenica Costantino (Polytechnic University of Bari), Ahmed Kamal Hamed Dewedar (University “G. d’Annunzio” of Chieti-Pescara), Massimo Leserri (Polytechnic University of Bari), Caterina Montanaro (Polytechnic University of Bari), Donato Palumbo (University “G. d’Annunzio” of Chieti-Pescara), Massimiliano Pepe (University “G. d’Annunzio” of Chieti-Pescara) and Alfredo Restuccia Garofalo (Polytechnic University of Bari)

PS28 High-Resolution 3D Surveying to Support Museum Inclusiveness Strategies

Gabriele Bitelli (Università di Bologna, DICAM), Anna Forte (Università di Bologna, DICAM) and Andrea Tirincanti (Museo del Territorio di Riccione)

PS29 Metal finds from the Etruscan site of Spina (Ostellato - FE - Italy), 2023 field: preliminary results

Colin Ongari (University of Ferrara), Elena Marrocchino (University of Ferrara), Negar Eftekhari (University of Ferrara) and Carmela Vaccaro (University of Ferrara)

PS30 Medieval church bell sound generation for vibroacoustic landscape studies

Marco Casazza (University of Salerno) and Fabrizio Barone (University of Salerno)

PS31 Hard vibroacoustic metrology for intangible cultural heritage: The case of church bells tuning

Rosa Fiorillo (Università di Salerno), Marco Casazza (Università degli Studi di Salerno) and Fabrizio Barone (Università degli Studi di Salerno)

PS32 Preliminary results obtained by a non-destructive multi-analytical approach applied to a self-portrait by Giuseppe Sabatelli, son of Prof. Luigi Sabatelli professor at Brera Academy, and to an inscription by Natale Longoni on a shaving bowl lid

Giulia Galli (University of Milan), Chiara Andrea Lombardi (University of Milan), Chiara Nenci (Accademia di Belle Arti di Brera), Carlo Mariani (Architect), Paola Fermo (University of Milan) and Valeria Comite (University of Milan)

PS33 Digitally Weaving the Past: Virtual Reconstruction of Tutankhamun's Textile Collection

Islam Shaheen (Sapienza University of Rome - Grand Egyptian Museum) and Nagmeldeen Hamza (Grand Egyptian Museum-conservation center)

- PS34 Geophysical data acquisition for a non-invasive diagnosis at the Convitto Palmieri in Lecce**
Dora Francesca Barbolla (ISPC-CNR), Lara De Giorgi (ISPC-CNR), Ivan Ferrari (ISPC-CNR), Francesco Giuri (ISPC-CNR) and Giovanni Leucci (ISPC-CNR)
- PS35 Integrating Historical Sources and Infrared Thermography for Detection of Seismic Damage in Architectural Heritage**
Fabrizio Terenzio Gizzi (CNR-ISPC), Edoardo Gerdali (CNR-IMAA), Maria Rosaria Potenza (CNR-ISPC) and Maria Sileo (CNR-ISPC)
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Lara De Giorgi (ISPC-CNR), Giancarlo De Pascalis (Università di Roma La Sapienza), Ivan Ferrari (ISPC-CNR), Francesco Giuri (ISPC-CNR) and Giovanni Leucci (ISPC-CNR)
- PS39 ERT survey at the Roman Bath in Sagalassos (Turkey)**
Lara De Giorgi (ISPC-CNR), Dora Francesca Barbolla (ISPC-CNR) and Giovanni Leucci (ISPC-CNR)
- PS40 THE ARCHAEOLOGICAL SITE OF ANGLONA (MT): GEOPHYSICAL SURVEYS TO UNDERSTAND THE SETTLEMENT DISPOSITION**
Lara De Giorgi (ISPC-CNR), Dora Francesca Barbolla (ISPC-CNR) and Giovanni Leucci (ISPC-CNR)
- PS41 Archeology of the future and the simulacrum for heritage As-Becoming solutions**
Fernando Birello de Lima (State University of Mato Grosso), Simone Helena Tanoue Vizioli (University of São Paulo), Luciana Pelaez Mascaro (Federal University of Mato Grosso) and Amanda Kirchesch Castrillon Mendes (Federal University of Mato Grosso)
- PS42 Digital Built Heritage Representation and Documentation: A Systematic Mapping of Platforms and Hybrid Models**
Maisa Almeida (University of São Paulo), Marcela Noronha (Postdoctoral Fellow at the Faculty of Civil Engineering, Architecture and Urban Design, UNICAMP), Marcio Fabricio (Full Professor at the University of São Paulo, Architecture and Urbanism Institute (IAU USP)) and Alfonso Ippolito (Full Professor at the DSDRA, Sapienza University of Rome)
- PS43 The First 21st Century Comprehensive Restored Plan of Hadrian's Villa and its Metrological Analysis**
Michael Ytterberg (Drexel University)

- PS44 From Visual Perception to Automated Detection: Integrating NDVI, SCP, and AI for the Identification of Archaeological Surface Markers**
Filomena Papaleo (Università degli Studi di Genova) and Simone Giosuè Madeo (Università degli Studi di Genova)
- PS45 Application of Charged Particle Activation Analysis (CPAA) in archaeology**
Chaturvedula S. Sastri (Scientist (retired) - (Guest at CNRS-CEMHTI, Orleans, France)), Thierry Sauvage (CNRS, CEMHTI UPR 3079, Orleans), Olivier Wendling (CNRS, CEMHTI UPR 3079, Orleans), Aurélien Bellamy (CNRS, CEMHTI UPR 3079, Orleans), William Hate (CNRS, CEMHTI UPR 3079, Orleans), Paul Sigot (CNRS, CEMHTI UPR 3079, Orleans), Frédéric Foucher (CNRS, CEMHTI UPR 3079, Orleans) and Christian Humburg (Medical doctor)
- PS46 Multi-technique integrated analysis to discover the invisible on the Camponeschi Monument in L'Aquila**
Luisa Caneve (ENEA), Valeria Spizzichino (ENEA), Massimiliano Guarneri (ENEA), Federico Angelini (ENEA), Roberto Chirico (ENEA), Elena De Panfilis (GSSI) and Speranza Falciano (GSSI)
- PS47 Digital Heritage Conservation: The SENNSE IoT Platform as a Structured Approach for Cultural Heritage Monitoring Projects**
Davide Zecca (ISPC-CNR, Lecce, Italy), Irene Muci (Università La Sapienza, Rome, Italy), Francesco Valentino Taurino (ISPC-CNR, Lecce, Italy), Mohamed Ali Jaziri (ISPC-CNR, Lecce, Italy) and Alberto Bucciero (ISPC-CNR, Lecce, Italy)
- PS48 Modeling Memory: Ethical Reuse and AI Training with Archaeologist-Produced 3D Reconstructions**
Simone Pio Barbagallo (University of Catania), Davide Tanasi (University of South Florida) and Filippo Stanco (University of Catania)
- PS49 Digital Documentation and Virtual Accessibility of Prehistoric Artefacts: Case Studies from Sicilian Museums**
Dario Calderone (Ludwig Maximilians Universität, Munich), Davide Tanasi (University of South Florida), Enrico Greco (Institute for the Advanced Study of Culture and the Environment, University of South Florida, Tampa (FL), USA), Stephan Hassam (Randolph-Macon College, Ashland (VA), USA) and Madeleine Kraft (Digital Exploration, University of South Florida, Tampa (FL), USA)
- PS50 Preliminary findings from a non-invasive and micro-invasive multi-analytical study of the painting “Posa della Prima Pietra” by Ismaele Teglio Milla (1853)**
Paola Fermo (University of Milan), Valeria Comite (University of Milan), Chiara Andrea Lombardi (University of Milan), Mattia Borelli (University of Milan), Andrea Bergomi (University of Milan), Letizia Bonizzoni (University of Milan), Francesca Sabatini (University of Milano-Bicocca), Giulia Galli (University of Milan), Gianluca Carabelli (University of Milan) and Daniele Bolleri (University of Milan)



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