

**2021 IEEE INTERNATIONAL CONFERENCE ON
METROLOGY FOR ARCHAEOLOGY
AND CULTURAL HERITAGE**



MILANO, ITALY / OCTOBER 20-22, 2021



CONFERENCE PROGRAM



2021 IEEE INTERNATIONAL CONFERENCE ON METROLOGY FOR ARCHAEOLOGY AND CULTURAL HERITAGE



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TABLE OF CONTENTS

MetroArchaeo 2021 Welcome Message.....	2
MetroArchaeo 2021 Committe.....	4
MetroArchaeo 2021 Plenary Speakers.....	6
Plenary Wednesday, October 20, 2021 - H 15:00	6
Plenary Thursday, October 21, 2021 - H 09:00	7
Plenary Thursday, October 21, 2021 - H 14:30	8
Plenary Friday, October 22, 2021 - H 09:30	9
October 21, 2021 - Chemical Investigation.....	10
Conference Venue.....	11
MetroArchaeo 2021 Patronages.....	13
MetroArchaeo 2021 Sponsors.....	14
Program Schedule - October 20, 2021	15
Program Schedule - October 21, 2021	16
Program Schedule - October 22, 2021	17
Technical Sessions - Wednesday, October 20.....	18
Technical Sessions - Thursday, October 21.....	24
Technical Sessions - Friday, October 22.....	37

MetroArcheo 2021 Welcome Message

On behalf of the Organizing Committee, we wish to welcome you to the *2021 IEEE International Conference on Metrology for Archaeology and Cultural Heritage - MetroArcheo2021*.

The combined use of numerical approaches and metrology in archaeology and, more generally, in the study of cultural heritage, is a firmly established reality in contemporary research, which is undergoing rapid evolution both in the scale, type and scope of applications. Metrology includes both theoretical and practical aspects with reference to measurements, whatever their uncertainties are, and in whatever fields of science or technology they occur. The characterization, valorisation and preservation of cultural heritage are therefore deeply related to metrological issues, for the collection, interpretation and validation of data, through the use of different analytical tools, physical-chemical and mechanical techniques, digital technologies, new ICT tools.

MetroArcheo2021 aims to gather a wide range of scholars and heritage scientists working in universities and research centres, museums, galleries, libraries, archives, small and medium enterprises. *MetroArcheo2021* is conceived as an occasion to foster exchanges of ideas and information, to establish connections and collaborations, and to share innovative solutions in the field of measurements applied to cultural heritage, among material scientists, chemists, physicists, engineers, archaeologists, conservators, restorers.

Following the positive experience of the first editions held in Benevento (2015), Turin (2016), Lecce (2017), Cassino (2018), Florence (2019), Trento – virtual way (2020), this year MetroArcheo has been organized in Milan. Due to the positive results of rules to limit the pandemia effects, we have concluded that it is safe to organise our annual meeting live in Milan and we strictly adopted the necessary safety measures according to National, Regional and University of Milan rules.

Milan is a town that houses the testimonies of a prestigious historical and cultural tradition, spanning from Roman antiquity to Middle Ages, up to modern times. The activities aimed at the conservation, protection, enhancement and use of cultural heritage, through the development and application of innovative methods and technologies, have a consolidated academic, scientific and entrepreneurial tradition, recognized both at a national and international level, in the territory of Lombardia Region. The University of Milan stands out for its commitment in this sector, with a number of initiatives involving a wide range of skills, projects, collaborations in progress with other research institutions, and industries.

Milan is, therefore, a perfect frame for a conference designed to encourage discussion and networking among scientists coming from all over the world, and to promote new interactions and collaborations among established scholars and new researchers working in different areas and interested in the use of measurements in the study of cultural heritage.

MetroArcheo2021 hosts 21 oral, poster and demo sessions aiming to give a complete and multidisciplinary picture of the applications of measurements and data treatments to the characterization and safeguard of archaeological and historic heritage.

With the aim of providing a common ground for researchers to share their findings about metrology applied to archaeology and cultural heritage, MetroArchaeo2021 includes a significant number of special sessions, intended to group the different applications of metrology to archaeology and cultural heritage into thematic strands, and to allow coherent and targeted discussions.

The program includes four keynote lectures, which will be delivered by Daniela Comelli, Politecnico di Milano (Italy), Marta Castillejo, Instituto de Química Física Rocasolano, Spain, Patrizia Piacentini, Università degli Studi di Milano (Italy), David Watkinson, Conservation at Cardiff University, UK.

Two Tutorials will be held on *"Mass Spectrometry Approaches for the characterization of materials used in cultural heritage objects"* and *"Speeding up the heritage research with Table Top Microscopes"*.

A Round Table on *"Gender equality in Cultural Heritage: which path towards inclusivity?"* organized by IEEE Women in Engineering

Awards will be assigned to a number of outstanding papers, posters and demos.

The organisation of the conference was a very complex task, due to the large interest in the wide range of topics listed in the call for papers. A generous and tireless scientific and organising committee was involved in drafting the technical program, arranging accommodation for the speakers, managing the administrative aspects, and setting up the social programme. We are very grateful to all of them for their outstanding work, as well as to the reviewers who have contributed to guarantee the quality of the scientific program. We also wish to thank the public and private organizations which have kindly accepted to support the meeting in different ways.

The *2021 IEEE International Conference on Metrology for Archaeology and Cultural Heritage* is about to begin. We hope you will enjoy the company of colleagues and experts as well as the natural and artistic beauties of Milan! Please, let us have your comments and remarks: we all, metrologists, archaeologists, geologists, heritage scientists, colleagues and friends, know that criticism is the best way to improve quality, and to achieve lasting excellences.

We are very pleased to finally be able meeting you live this year... See you in Milan!

On behalf of the Organizing Committee
Paola Fermo
Pasquale Daponte

MetroArchaeo 2021 Committe

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Gianluca Quarta, University of Salento, Italy
Maria Ricciardi, University of Salerno, Italy
Carmen Maria Roskopf, University of Molise, Italy
Lucia Toniolo, Politecnico di Milano, Italy
Constantini Samara, Aristotle University of Thessaloniki, Greece
José Antonio Barrera Vera, University of Seville, Spain

MetroArchaeo 2021 Plenary Speakers

Plenary Wednesday, October 20, 2021 - H 15:00

Quantifying corrosion to inform treatment design for the preservation of heritage metals

David Watkinson

Conservation at Cardiff University, UK

ABSTRACT

Conservation aims to apply evidence based practices and management strategies to preserve our heritage. Since characterisation and experimental studies must supply the data that will make it possible to fulfil this goal, the nature and contextual value of the qualitative and quantitative data that will be used to do this is important. The relationship between measurement technique and the sample from which the data is being collected involves a complex set of intrinsic and extrinsic variables that will define how effectively the data output fulfils the end goal. This theme is discussed using a methodology that remotely quantifies oxygen consumption to determine the corrosion rate of archaeological and heritage metals. The data produced is used to examine the effectiveness of corrosion control treatments and to assign a scale for assessing the risk of corrosion for iron during storage and display. The impact of this on decision making and expectation, when choosing and applying preservation treatments and strategies, is discussed.

SPEAKER BIO

David Watkinson is Professor of Conservation at Cardiff University, where he teaches and researches conservation theory and practice, with emphasis on the corrosion and treatment of ferrous metals. His research into desiccated storage of unstable iron underpinned the conservation of Brunel's steamship ss Great Britain, which was awarded the Gulbenkian Museum prize in 2006. In 2010 he was awarded the Plowden Medal for innovative research and contributions to the conservation profession. Having served on National and International committees within the conservation profession, including the Council of the International Institute for Conservation and The United Kingdom Institute for Conservation, he is currently a vice chair of the working party 21 Corrosion and Conservation of Heritage Artefacts in the European Federation of Corrosion.



Plenary Thursday, October 21, 2021 - H 09:00

A novel versatile hyperspectral camera for the study of cultural heritage objects: examples of applications at different spatial scales and in different spectral ranges

Daniela Comelli

Politecnico di Milano, Italy

ABSTRACT

In the heritage science field, hyperspectral imaging has become a popular method for the non-invasive investigation, documentation and diagnostics of cultural heritage. The method is often applied to study polychrome surfaces of small or medium size objects in museum collections, while more recently it has also been effectively implemented in outdoor applications on large mural surfaces.

In the present talk, we discuss the applications of a novel hyperspectral camera based on a Fourier Transform spectrometer, the translating wedge-based identical pulse encoding system (TWINS) [1]. The developed hyperspectral camera is compact and robust and displays high-collection throughput, a broad spectral coverage, and a minimum spectral resolution, which can be flexibly adjusted for each measurement, of 3 THz (4 nm at 600 nm).

We highlight the high-versatility of this new set-up, showing how the camera can be easily adapted for both remote imaging of artistic surfaces and for microscopy measurements. Through illustrative examples, ranging from pigment mapping in paintings to the study of artistic glass windows, we show how it can be employed for diffuse reflectance measurements in different spectral regions of the electromagnetic spectrum, for the study of photoluminescent materials and for detecting the spatial distribution of Raman fingerprints.

SPEAKER BIO

Daniela Comelli is the head of the ArtIS (Imaging and Spectroscopy for Art) research group at the Physics Department of Politecnico di Milano. Therein, the research activity is focused on the development of laser-based spectroscopy techniques for the in-situ study of works of art and the non-invasive characterization of organic and inorganic compounds relevant in the field of Conservation Science, including time-resolved fluorescence imaging, hyperspectral imaging, remote Raman mapping and micro-Raman spectroscopy.

Her research activity is proved by the publication of more than 100 scientific papers in international ISI journals and international conference proceedings (h-index: 24).



Plenary Thursday, October 21, 2021 - H 14:30

Measuring thicknesses in multilayer heritage substrates: a non-invasive photonic approach by nonlinear optical microscopy

Marta Castillejo

Instituto de Química Física Rocasolano (CSIC), Spain

ABSTRACT

The study of valuable historical objects and substrates with 3D structural and chemical characterization benefits from the availability of non-invasive techniques. Particularly, determination of the thickness of constituent and degradation layers is important to evaluate artistic styles, manufacturing techniques and to select adequate conservation strategies. Nonlinear optical microscopy has been recently introduced for the analysis of multilayer and multicomponent cultural heritage substrates. Nonlinear optical signals are generated via the interaction of the material of the sample with a tightly focused infrared femtosecond laser, where the high peak power and short time duration of the laser pulses favour nonlinear optical processes without unwanted side effects such as photobleaching and/or phototoxicity. Various modalities of the technique, i.e. Multi-Photon Excitation Fluorescence and Second and Third Harmonic Generation, allow state-of-the-art, non-invasive analysis of objects and samples with intrinsic micrometric lateral and axial resolution. In this lecture, I will present examples about the characterization and thickness determination, via MPEF microscopy, of varnish and paint layers on pictorial substrates and of grisailles and corrosion layers on historical glasses. The comparison with other more conventional techniques requiring sample-taking shows good consistency and agreement and illustrates the advantages of this new photonic approach.

SPEAKER BIO

Marta Castillejo obtained a PhD degree in Physics from Complutense University of Madrid in 1984. She is a Senior Research Scientist at Instituto de Química Física Rocasolano, CSIC, in Madrid, where she acts as Coordinator of the CSIC Interdisciplinary Platform "Open Heritage: Research and Society". Her scientific activity encompasses a wide range of aspects of Laser Physics and Photonics, including fundamentals of laser-matter interactions and applications in Nanoscience and Heritage Science. She has authored more than 210 publications in peer-reviewed journals (ca. 5200 citations), 15 invited conference proceedings contributions and 6 chapters in collective books. She has acted as Editor of 4 Volumes of proceedings and has delivered more than 45 invited talks worldwide. Her record of international collaborations includes participation in numerous projects funded by EU framework programs, the coordination of bilateral program exchanges with Academic European Institutions and her activities as Academic Visitor at University Cergy-Pontoise, Observatoire de Paris Meudon in France, Department of



Chemistry and Chemical Biology of Harvard University, Blackett Laboratory of Imperial College London and Istituto Nazionale di Ottica, CNR. She has long experience in training young scientists by lecturing in various Doctorate and Master Courses and by supervising 8 PhD Thesis. Marta Castillejo has been involved in the development and growth of European Research Infrastructures, including LASERLAB Europe, IPERION CH, PARTHENOS and the ongoing IPERION HS that precedes the launch of the future European Infrastructure for Heritage Science (E-RIHS). She acts as permanent member of the scientific committee of the international conference series Lasers in the Conservation of Artworks (LACONA), Non-destructive and Microanalytical Techniques in Art and Cultural Heritage (TECHNART), SPIE International Symposium on Optical Metrology (O3A) and Conference on Laser Ablation (COLA), all contributing to the impact of an international community of scientists and conservators on the success of lasers for applications in heritage and archaeology.

Plenary Friday, October 22, 2021 - H 09:30

Archaeology and hard sciences: the case of the Aga Khan Necropolis at Aswan, Egypt

Patrizia Piacentini

Università degli Studi di Milano

SPEAKER BIO

Patrizia Piacentini has been Professor of Egyptology and Egyptian Archeology at the University of Milan since 1993, where she is also scientific director of the Egyptological Library and Archives and coordinator of the PhD Program in Cultural Heritage Sciences. Since 2017, she is the Co-Director of the Egyptian-Italian Mission at West Aswan which excavates and studies a large necropolis that covers over a thousand years of history. She is a member of Scientific or Presidency Committees of numerous Egyptological Associations and Foundations, and representative for Italy of the International Association of Egyptologists. Author of numerous monographs and scientific articles, she has organized exhibitions on Ancient Egypt in various countries of the world and numerous congresses. She is the founder and director of the journal EDAL, Egyptian and Egyptological Documents Archives Libraries (Milan) and is a member of the scientific or editorial board of numerous journals, including *Aegyptus* (Milan).



October 21, 2021 - Chemical Investigation

On **October 21st**, we have the pleasure to invite you to participate in a series of chemical investigations that will be conducted by portable Raman and XRF spectroscopies on the monumental complex **I'Aratura** (also named *Il Lavoro*, 1912) by Enrico Butti (1847 - 1932), Milan, Monumental Cemetery, Besenianica family sepulture.

Due to COVID restrictions, in order to join, it is necessary to book by sending an e-mail to: vittoria.guglielmi@unimi.it

Please, include in the e-mail a copy of your identity card, which is required because of organisational issues.

The appointment is at the **Monumental Cemetery on October 21st at 12 AM.**

The place is easily reachable by public transport (ask for information at the conference desktop).

The maximum number of people allowed is 10.

Book your place!



Conference Venue

UNIVERSITY OF MILAN

The Conference will be held at the University of Milan.

Address: Via Festa del Perdono, Milano

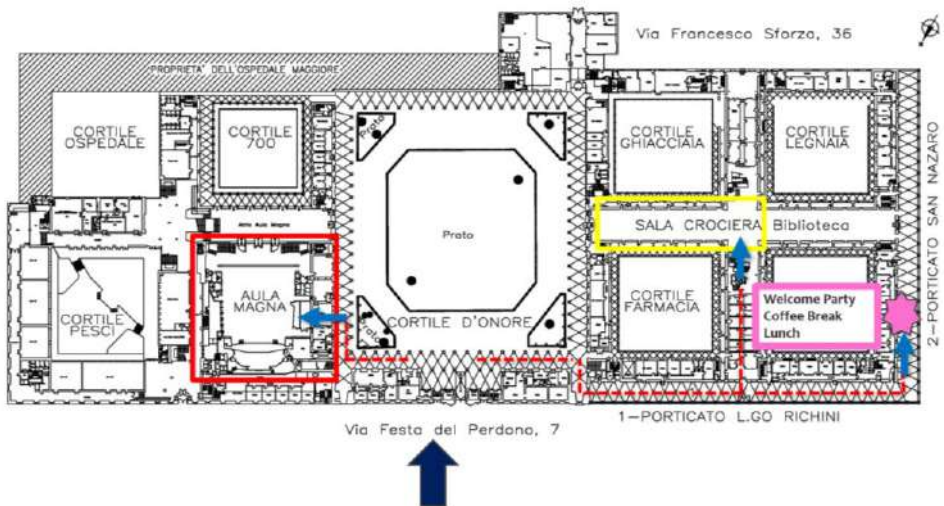
Also known as "La Statale", the University of Milan is, relatively speaking, one of Italy's younger university institutions. It was founded in 1924 thanks to the tenacious efforts of doctor and gynaecologist Luigi Mangiagalli, who in creating La Statale, realised his long-held dream of building a university for Lombardy's regional capital.

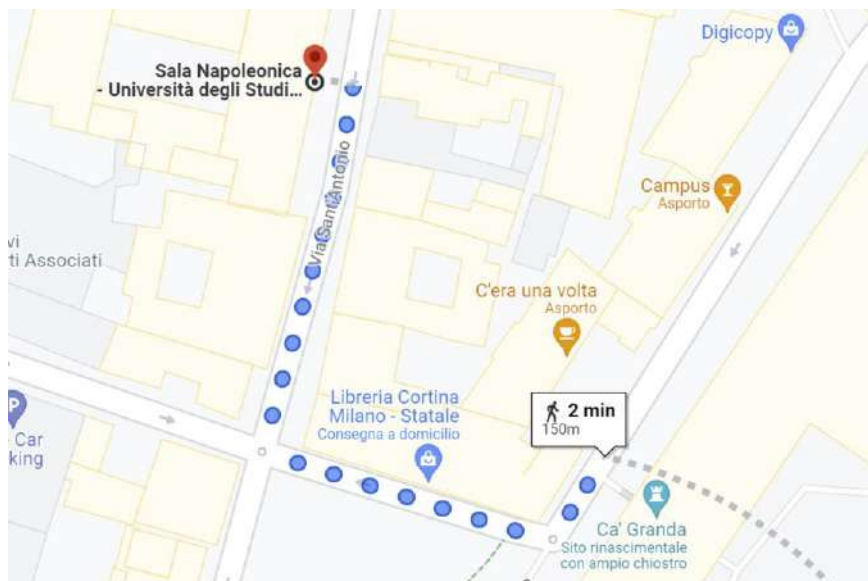
Conference Halls

Aula Magna, University of Milan

Sala Crociera, University of Milan

Sala Napoleonica, University of Milan





WELCOME PARTY

Wednesday, October 20 - 19:00 - 20:30

The MetroArcheo 2021 Welcome Party will be held at the University of Milano, via Festa del Perdono.

GALA DINNER

Thursday, October 21 - 20:30 - 23:00

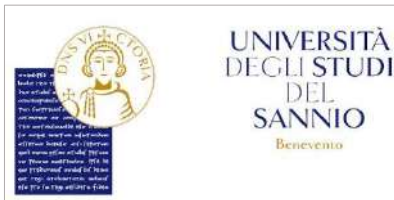
The MetroArcheo 2021 Gala Dinner will be held at *Osteria Mamma Rosa*.

Address: Piazza Cincinnato 4, Milano



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Program Schedule - October 20, 2021

WEDNESDAY, OCTOBER 20			
14:30 - 15:00	Opening Ceremony		
15:00 - 16:00	Keynote Lecture - Quantifying corrosion to inform treatment design for the preservation of heritage metals David Watkinson, <i>Conservation at Cardiff University</i>		
16:00 - 16:20	Coffee Break		
	Aula Magna Università di Milano	Sala Crociera Università di Milano	Sala Napoleonica Università di Milano
16:20 - 18:00	Session 1.1 Special Session - Light-based techniques for analysis, diagnostics and conservation of historical-artistic and museum cultural heritage	Session 1.2 Special Session: Integrated digital survey methodologies for the knowledge and enhancement of architectural and urban heritage - PART 1	Session 1.3 Measurement and instrumentation in cultural heritage: from ancient instruments to advanced approaches
18:00 - 18:45	Tutorial Session #1 Mass Spectrometry Approaches for the characterization of materials used in cultural heritage objects <i>Mattia Casanova, Silvia Giordano, Shimadzu Italia</i>	Tutorial Session #2 Speeding up the heritage research with Table Top Microscopes <i>Massimo Tagliaferro, NanoVision</i>	
19:00 - 20:30	Welcome Party		

Program Schedule - October 21, 2021

THURSDAY, OCTOBER 21			
09:00 - 10:00	Keynote Lecture - A novel versatile hyperspectral camera for the study of cultural heritage objects: examples of applications at different spatial scales and in different spectral ranges Daniela Comelli, <i>Politecnico di Milano, Italy</i>		
	Aula Magna Università di Milano	Sala Crociera Università di Milano	Sala Napoleonica Università di Milano
10:00 - 11:40	Session 2.1 Special Session - Novel measurement methods, transduction principles and intercomparison in the cultural heritage	Session 2.2 Special Session - Integrated digital survey methodologies for the knowledge and enhancement of architectural and urban heritage - PART 2	Session 2.3 Special session - Archaeometry for archaeology: Provenancing and technological assessment of artifacts from archaeological sites and museums
11:40 - 12:00	Coffee Break		
12:00 - 13:00	Session 3.1 Special session - Development and upgrade of instruments and methods in the cultural heritage field	Session 3.2 Special session - 3D and multispectral scanning analysis for cultural heritage applications	
13:00 - 14:30	Lunch		
14:30 - 15:30	Keynote Lecture - Measuring thicknesses in multilayer heritage substrates: a non-invasive photonic approach by nonlinear optical microscopy Marta Castillejo, <i>Instituto de Química Física Rocasolano (CSIC), Spain</i>		
15:30 - 16:30	Round Table Gender equality in Cultural Heritage: which path towards inclusivity?		
16:30 - 16:50	Coffee Break		
	Aula Magna Università di Milano	Sala Crociera Università di Milano	Sala Napoleonica Università di Milano
16:50 - 18:30	Session 4.1 Special session - IoT based systems for the structural health monitoring, architectural survey and the analysis of cultural heritage building and archaeological sites	Session 4.2 Special session - Non-invasive systems and techniques for "on-site" monitoring and diagnosis	Session 4.3 Geomatics and cultural heritage: Multi-source data for recording, modeling, visualization and metric documentation of historical sites, monuments, structures and past landscape - PART 1
20:30 - 23:00	Gala Dinner		

Program Schedule - October 22, 2021

FRIDAY, OCTOBER 22			
09:30 - 10:30	Keynote Lecture - Archaeology and hard sciences: the case of the Aga Khan Necropolis at Aswan, Egypt Patrizia Piacentini, Università degli Studi di Milano		
	Aula Magna Università di Milano	Sala Crociera Università di Milano	Sala Napoleonica Università di Milano
10:30 - 12:00	Session 5.1 Geomatics and cultural heritage: Multi-source data for recording, modeling, visualization and metric documentation of historical sites, monuments, structures and past landscape - PART 2	Session 5.2 Special session - Damage assessment: diagnosis and monitoring for the restoration, preventive conservation and maintenance of CH	Session 5.3 Special session - Multiscale and multitemporal high resolution remote sensing and non-destructive testing for archaeology and monumental heritage: From research to preservation - PART 1
12:00 - 13:30	Coffee Break Poster Session Demo Session		
13:30 - 14:30	Lunch		
	Aula Magna Università di Milano	Sala Crociera Università di Milano	Sala Napoleonica Università di Milano
14:30 - 16:10	Session 6.1 Special session - Analytical methods to investigate organic materials in cultural heritage: From archaeological biomaterials to modern art	Session 6.2 Special session - Recent advancements in dating methods	Session 6.3 Special session - Multiscale and multitemporal high resolution remote sensing and non-destructive testing for archaeology and monumental heritage: From research to preservation - PART 2
16:10 - 16:30	Coffee Break		
16:30 - 17:50	Session 7.1 Special session - Advancements in high resolution multi wavelength imaging techniques of painted surfaces	Session 7.2 General Session	Session 7.3 Special session - Multiscale and multitemporal high resolution remote sensing and non-destructive testing for archaeology and monumental heritage: From research to preservation - PART 3
17:50 - 18:10	Closing and Award Ceremony		

Technical Sessions - Wednesday, October 20

14:00 - 18:00

REGISTRATION

Room: Aula Magna, Università di Milano

14:30 - 15:00

OPENING SESSION – WELCOME ADDRESSES

Room: Aula Magna, Università di Milano

Paola Fermo, University of Milano, MetroArchaeo 2021 General Chair

Pasquale Daponte, University of Sannio, MetroArchaeo 2021 General Chair

Maria Pia Abbracchio, Deputy Vice-Rector, University of Milano

Laura Prati, Head of Chemistry Department, University of Milano

15:00 - 16:00

PLENARY SESSION

Room: Aula Magna, Università di Milano

Chair: Sabrina Grassini, Politecnico di Torino, Italy

**Quantifying corrosion to inform treatment design for the
preservation of heritage metals**

David Watkinson, Conservation at Cardiff University

16:00 - 16:20

COFFEE BREAK

16:20 - 18:00

SESSION 1.1

Special Session - Light-based techniques for analysis, diagnostics and conservation of historical-artistic and museum cultural heritage

Room: Aula Magna, Università di Milano

Chairs: Valentina Venuti, University of Messina, Italy
Giuseppe Paladini, University of Messina, Italy

16:20 Diagnostic investigation of the Cycle of the New Church of Sarria (Floriana, Malta) by Mattia Preti

Valentina Venuti, University of Messina, Italy
Francesco Caridi, University of Messina, Italy
Emanuele Colica, University of Malta, Malta
Vincenza Crupi, University of Messina, Italy
Sebastiano D'Amico, University of Malta, Malta
Sante Guido, University of Trento, Italy
Domenico Majolino, University of Messina, Italy
Giuseppe Paladini, University of Messina, Italy
Giuseppe Mantella, Giuseppe Mantella Restauro Opere D'Arte, Italy

16:40 Multi-scale characterisation of late-medieval tournaments of Frankish Greece provenance

Giuseppe Paladini, University of Messina, Italy
Giuseppe Aciri, University of Messina, Italy
Francesco Caridi, University of Messina, Italy
Vincenza Crupi, University of Messina, Italy
Pasquale Faenza, G. Rohlfs Museum of the Calabrian Greek Language, Italy
Domenico Majolino, University of Messina, Italy
Valentina Venuti, University of Messina, Italy

17:00 SR-FTIR microscopy for the study of residues on Palaeolithic stone tools: looking for a methodological protocol

Clarissa Dominici, University of Siena, Italy
Chiaramaria Stani, CERIC-ERIC, Italy
Matteo Rossini, University of Siena, Italy
Lisa Vaccari, Elettra Sincrotrone Trieste, Italy

17:20 Challenges in laser cleaning of cultural heritage stained glass

Evan Maina Maingi, University of Burgos, Spain
Valérie Treil, HERCULES Laboratory, University of Évora, Portugal
María Pilar Alonso Abad, University of Burgos, Spain
Luis A Angurel, CSIC-University of Zaragoza, Spain
Md Ashiqur Rahman, CSIC-University of Zaragoza, Spain
Remy Chapoulie, Bordeaux Montaigne University, France
Stephan Dubernet, Bordeaux Montaigne University, France
Nick Schiavon, HERCULES Laboratory, University of Évora, Portugal
German F de la Fuente, CSIC-University of Zaragoza, Spain

17:40 Short pulse laser irradiation: new possibilities for cleaning archaeological bones

Md Ashiqur Rahman, CSIC - University of Zaragoza, Spain
German F de la Fuente, CSIC - University of Zaragoza, Spain
Luis A Angurel, CSIC - University of Zaragoza, Spain
J M Carretero, Universidad de Burgos, Spain
Evan Maina Maingi, Universidad de Burgos, Spain
M Pilar Alonso Abad, Universidad de Burgos, Spain
Rodrigo Alonso Alcalde, Museo de la Evolución Humana, Spain
Remy Chapoulie, Bordeaux Montaigne University, France
Nick Schiavon, HERCULES Laboratory, University of Évora, Portugal

16:20 - 18:00**SESSION 1.2****Special Session - Integrated digital survey methodologies for the knowledge and enhancement of architectural and urban heritage - PART 1****Room:** Sala Crociera, Università di Milano**Chairs:** Assunta Pelliccio, University of Cassino, ItalyMarco Giorgio Bevilacqua, University of Pisa, Italy

16:20 Virtual reconstruction of a ghost disco: the Woodpecker in Milano Marittima

Cristiana Bartolomei, Alma Mater Studiorum University of Bologna, Italy
Cecilia Mazzoli, Alma Mater Studiorum University of Bologna, Italy
Caterina Morganti, Alma Mater Studiorum University of Bologna, Italy

16:40 Towards a catalogue of Sardinian WWII Heritage. The protection of Quartu Sant'Elena and its territory

Andrea Pirinu, University of Cagliari, Italy

Raffaele Argiolas, University of Cagliari, Italy

Nicola Paba, University of Cagliari, Italy

17:00 TLS data and theoretical models for ribbed vault geometry analysis

Vincenzo Bagnolo, University of Cagliari, Italy

Raffaele Argiolas, University of Cagliari, Italy

Cristina Vanini, University of Cagliari, Italy

17:20 Ghost Village Revival: research and revitalization process of demolished historical settlement in Upper Lusatia, Poland

Magdalena Żmudzińska-Nowak, Silesian University of Technology, Poland

Elżbieta Rdzawska-Augustin, Silesian University of Technology, Poland

Tomasz Steidl, Silesian University of Technology, Poland

17:40 3D modelling workflows applied to the historical city: an assessment on quantitative and qualitative optimizations for the correspondence of hybrid Mesh-NURBS surfaces

Raffaella De Marco, University of Pavia, Italy

Francesca Galasso, University of Pavia, Italy

16:20 - 17:40

SESSION 1.3

Measurement and instrumentation in cultural heritage: from ancient instruments to advanced approaches

Room: Sala Napoleonica, Università di Milano

Chairs: Emma Angelini, Politecnico di Torino, Italy

Leonardo Iannucci, Politecnico di Torino, Italy

16:20 The frog thermometer, a challenge of Ferdinand II de' Medici, Grand Duke of Tuscany

Emma Angelini, Politecnico di Torino, Italy

Andrea Gori, Museo Galileo - Firenze, Italy

Marco Parvis, Politecnico di Torino, Italy

16:40 Raman spectroscopic characterization of corrosion products of archaeological iron

Amina Vietti, Politecnico di Torino, Italy

Emma Angelini, Politecnico di Torino, Italy

Sabrina Grassini, Politecnico di Torino, Italy

Nicola Donato, University of Messina, Italy

17:00 Atmospheric corrosion of outdoor bronze artefacts: the case study of 'Katarsis', by Magdalena Abakanowicz

Leila Es Sebar, Politecnico di Torino, Italy

Leonardo Iannucci, Politecnico di Torino, Italy

Marco Parvis, Politecnico di Torino, Italy

Sabrina Grassini, Politecnico di Torino, Italy

Emma Angelini, Politecnico di Torino, Italy

17:20 Environmental monitoring solution for cultural heritage

Luca Lombardo, Politecnico di Torino, Italy

Marco Parvis, Politecnico di Torino, Italy

Sabrina Grassini, Politecnico di Torino, Italy

Emma Angelini, Politecnico di Torino, Italy

18:00 - 18:45

TUTORIAL SESSION #1

Room: Aula Magna, Università di Milano

Chair: Vittoria Guglielmi, University of Milano, Italy

Mass Spectrometry Approaches for the characterization of materials used in cultural heritage objects

Mattia Casanova, Silvia Giordano, Shimadzu Italia



18:00 - 18:45

TUTORIAL SESSION #2

Room: Sala Crociera, Università di Milano

Chair: Giuseppe Paladini, University of Messina, Italy

Speeding up the heritage research with Table Top Microscopes

Massimo Tagliaferro, NanoVision

19:00 - 20:30

WELCOME PARTY

Place: Università di Milano

Technical Sessions - Thursday, October 21

08:30 - 18:00

REGISTRATION

Room: Aula Magna, Università di Milano

09:00 - 10:00

PLENARY SESSION

Room: Aula Magna, Università di Milano

Chair: Paola Fermo, University of Milano, Italy

**A novel versatile hyperspectral camera for the study of cultural heritage objects:
examples of applications at different spatial scales and in different spectral ranges**

Daniela Comelli, Politecnico di Milano, Italy

10:00 - 11:40

SESSION 2.1

**Special Session - Novel measurement methods, transduction principles and
intercomparison in the cultural heritage**

Room: Aula Magna, Università di Milano

Chairs: Anna Maria Gueli, Università di Catania & INFN, Italy

Carlo Trigona, Università di Catania

**10:00 Evaluation of air pollutants in thermal-mineral springs: a case study of Agnano
(Naples, Italy) and Contursi Terme (Salerno, Italy)**

Concetta Pironti, University of Salerno, Italy

Maria Ricciardi, University of Salerno, Italy

Oriana Motta, University of Salerno, Italy

Ylenia Miele, University of Salerno, Italy
Antonino Fiorentino, University of Salerno, Italy
Raffaele Cucciniello, University of Salerno, Italy
Antonio Faggiano, University of Salerno, Italy
Antonio Proto, University of Salerno, Italy

10:20 Investigation on the deterioration of lead artifacts. A case study on piano keys and their degradation products

Antonio Faggiano, University of Salerno, Italy
Maria Ricciardi, University of Salerno, Italy
Concetta Pironti, University of Salerno, Italy
Oriana Motta, University of Salerno, Italy
Ylenia Miele, University of Salerno, Italy
Prisco Prete, University of Salerno, Italy
Antonio Proto, University of Salerno, Italy

10:40 Analysis of PAHs (polycyclic aromatic hydrocarbons) and other main components in black crusts collected from the Monumental Cemetery of Milan (Italy)

Maria Ricciardi, University of Salerno, Italy
Antonio Faggiano, University of Salerno, Italy
Concetta Pironti, University of Salerno, Italy
Oriana Motta, University of Salerno, Italy
Maurizio Carotenuto, University of Salerno, Italy
Valeria Comite, University of Milan, Italy
Paola Fermo, University of Milan, Italy
Antonio Proto, University of Salerno, Italy

11:00 A method to improve the color rendering accuracy in cultural heritage: preliminary results

Dario Allegra, University of Catania, Italy
Giuseppe Furnari, University of Catania, Italy
Simona Gargano, University of Catania, Italy
Anna Gueli, University of Catania, Italy
Simone Parisi, University of Catania, Italy
Stefania Pasquale, University of Catania, Italy
Filippo Stanco, University of Catania, Italy
Giuseppe Stella, University of Catania, Italy

11:20 RE-SEMIIRTO project: an innovative network of wireless sensors for microclimate monitoring on the Royal Palace of Carditello

Antonio Spagnuolo, Energreenup srl, Italy

Carmela Vetromile, Energreenup srl, Italy

Antonio Masiello, Energreenup srl, Italy

Maria Francesca Alberghina, Start-test sas, Italy

Salvatore Schiavone, Start-test sas, Italy

Maria Rosa di Cicco, Università della Campania, Italy

Roberto Formato, Fondazione Real Sito di Carditello, Italy

Carmine Lubritto, Università della Campania, Italy

10:00 - 11:40

SESSION 2.2

Special Session - Integrated digital survey methodologies for the knowledge and enhancement of architectural and urban heritage - PART 2

Room: Sala Crociera, Università di Milano

Chairs: Assunta Pelliccio, University of Cassino, Italy

Marco Giorgio Bevilacqua, University of Pisa, Italy

10:00 Integrated survey procedures for seismic protection of monumental liturgical furniture

Ilaria Trizio, Construction Technologies Institute-National Research Council, Italy

Francesca Savini, Construction Technologies Institute-National Research Council, Italy

Adriana Marra, Construction Technologies Institute-National Research Council, Italy

Giovanni Fabbrocino, University of Molise, Italy

10:20 Point cloud management for a holographic visualization

Cecilia Bolognesi, Politecnico of Milano, Italy

Simone Balin, Politecnico of Milano, Italy

10:40 Digital tools applied to cultural heritage of the modernist residential architecture of the second half of 20th century. Case study of General Jerzy Ziętek's Villa in Ustroń, Poland

Jakub Bródka, Silesian University of Technology, Poland

Magdalena Wałek, Silesian University of Technology, Poland

11:00 Integrated Survey and 3D Processing on Enea CRESCO Platform: the Case Study of San Nicola in Carcere in Rome

Marco Puccini, ENEA TERIN ICT, Italy

Antonio Camassa, University Roma Tre, Italy

Maria Luisa Mongelli, ENEA TERIN ICT, Italy
 Samuele Pierattini, ENEA TERIN ICT, Italy
 Silvio Migliori, ENEA TERIN ICT, Italy
 Marco Canciani, University Roma Tre, Italy
 Giovanna Spadafora, University Roma Tre, Italy
 Mauro Saccone, University Roma Tre, Italy

11:20 3D multilevel approach for the seismic risk of historic centers

Marco Saccucci, University of Cassino and Southern Lazio, Italy
 Assunta Pelicchio, University of Cassino and Southern Lazio, Italy

10:00 - 11:40

SESSION 2.3

Special session - Archaeometry for archaeology: Provenancing and technological assessment of artifacts from archaeological sites and museums

Room: Sala Napoleonica, Università di Milano

Chairs: Fabrizio Antonelli, University of Venice, Italy
 Lara Maritan, University of Padova, Italy
 Rebecca Piovesan, University of Venice, Italy

10:00 The study of ancient archaeological finds through X-ray tomography: the case of the "Tintinnabulum" from the Museum of Anthropology and Ethnography of Torino

Luisa Vigorelli, Polytechnic of Torino, INFN, Italy
 Alessandro Re, University of Torino, INFN, Italy
 Laura Guidorzi, University of Torino, INFN, Italy
 Rosa Brancaccio, University of Bologna, Italy
 Cristina Bortolin, University of Torino, INFN, Italy
 Novella Grassi, University of Torino, INFN, Italy
 Giorgia Mila, University of Torino, INFN, Italy
 Nadia Pastrone, INFN, Italy
 Roberto Sacchi, University of Torino, INFN, Italy
 Sabrina Grassini, University of Torino, Italy
 Gianluigi Mangiapane, University of Torino, Italy
 Rosa Boano, University of Torino, Italy
 Alessandro Lo Giudice, University of Torino, INFN, Italy

10:20 Non-destructive magnetic and chemical characterization of granite column shafts traded in the Mediterranean area: the case of Piazza dei Miracoli in Pisa (Italy) and Basilica of Saint-Martin d'Ainay in Lyon (France)

Pierre Rochette, Aix-Marseille Université, France

Claudia Sciuto, University of Pisa, Italy

Simona Raneri, National Research Council, Institute of Chemistry and Organometallic Compounds, Italy

Anton Sutter, Opera della Primaziale Pisana, Italy

Ada Rovazzani, Opera della Primaziale Pisana, Italy

Luigi Folco, University of Pisa, Italy

Jean Paul Ambrosi, Aix-Marseille Université, France

Valérie Andrieu, Aix-Marseille Université, France

Jérôme Gattacceca, Aix-Marseille Université, France

Andreas Hartmann-Virnich, Aix-Marseille Université, France

10:40 Minero-petrographic characterization of white marble Roman finds from P.A. Garda Museum (Ivrea, TO)

Elena Storta, University of Torino, Italy

Alessandro Borghi, University of Torino, Italy

Paola Mantovani, Museo Civico P.A. Garda, Italy

Angela Deodato, Museo Civico P.A. Garda, Italy

Luigi Perotti, University of Torino, Italy

Alessandro Sani, Soprintendenza Archeologia, Belle Arti e Paesaggio per la Città Metropolitana di Torino, Italy

11:00 Glass-gems from the National Archaeological Museum in Aquileia: a PIXE/PIGE compositional study

Daniela Di Martino, University of Milano Bicocca, INFN, Italy

Elisabetta Galletti, University of Milano, Italy

Giulia Marcucci, University of Milano Bicocca, Italy

Quentin Lemasson, NewAGLAE, Ministère de la Culture/Chimie ParisTech, France

Maria Pia Riccardi, University of Pavia, Italy

11:20 A provenance study on the lapis lazuli collection from the Regional Museum of Natural Sciences in Turin

Laura Guidorzi, University of Torino, Italy

Alessandro Re, University of Torino, Italy

Debora Angelici, TecnArt S.r.l., Italy

Quentin Lemasson, Centre de Recherche et de Restauration des Musées de France

Claire Pacheco, Centre de Recherche et de Restauration des Musées de France

Laurent Pichon, Centre de Recherche et de Restauration des Musées de France



Brice Moignard, Centre de Recherche et de Restauration des Musées de France
Lorenzo Mariano Gallo, Museo Regionale di Scienze Naturali - Torino, Italy
Emanuele Costa, University of Torino, Italy
Roberto Cossio, University of Torino, Italy
Alessandro Lo Giudice, University of Torino, Italy

11:40 - 12:00
COFFEE BREAK

12:00 - 13:00
CHEMICAL INVESTIGATION - L'ARATURA
Place: Milan, Monumental Cemetery, Besenianica family sepulture

12:00 - 13:00
SESSION 3.1
Special session - Development and upgrade of instruments and methods in the cultural heritage field
Room: Aula Magna, Università di Milano
Chairs: Alessandro Re, Università di Torino and INFN, Italy
Alessandro Lo Giudice, Università di Torino and INFN, Italy

12:00 Comparison of the analytical performances of X-ray fluorescence devices
Maurizio Chiti, LNF - INFN, Italy
Raffaella Donghia, LNF - INFN, Italy
Adolfo Esposito, LNF - INFN, Italy
Marco Ferretti, CNR - Istituto di Scienze del Patrimonio Culturale, Italy
Astrik Gorghinian, LNF - INFN, Italy
Simone Porcinai, Opificio delle Pietre Dure, Italy

12:20 Study of the edge distortion effect in thermographic detection in semi-transparent Cultural Heritage
Sofia Ceccarelli, Università degli Studi di Roma Tor Vergata, Italy
Giovanni Caruso, CNR-ITABC, Italy
Fulvio Mercuri, Università degli Studi di Roma Tor Vergata, Italy

Stefano Paoloni, Università degli Studi di Roma Tor Vergata, Italy

Ugo Zammit, Università degli Studi di Roma Tor Vergata, Italy

Noemi Orazi, Università degli Studi di Roma Tor Vergata, Italy

12:40 Implementation of a non-destructive neutron imaging technique for inhomogeneous materials characterization

Giulia Marucci, University of Milano Bicocca, INFN, Italy

Antonella Scherillo, ISIS Neutron and Muon Source, UK

Anna Fedrigo, ISIS Neutron and Muon Source, UK

Davide Raspino, ISIS Neutron and Muon Source, UK

Daniela Di Martino, University of Milano Bicocca, INFN, Italy

Maria Pia Riccardi, University of Pavia, Italy

Costanza Cucini, Université de Technologie Belfort Montbéliard, France

12:00 - 13:20

SESSION 3.2

Special session - 3D and multispectral scanning analysis for cultural heritage applications

Room: Sala Crociera, Università di Milano

Chair: Paolo Di Stefano, University of L'Aquila, Italy

Emanuele Guardiani, University of L'Aquila, Italy

12:00 Digital survey and reconstruction for enhancing epigraphic readings with erode surface

Marco Limongiello, University of Salerno, Italy

Fausta Fiorillo, Politecnico di Milano, Italy

Luigi Vecchio, University of Salerno, Italy

Sara Antinozzi, University of Salerno, Italy

12:20 Focus-stacking system for 3D acquisition of sculptures and archaeological manufacts

Claudia Daffara, University of Verona, Italy

Sara Mazzocato, University of Verona, Italy

Dario Ambrosini, University of L'Aquila, Italy

12:40 Measurement of constant radius swept features in cultural heritage

Luca Di Angelo, University of L'Aquila, Italy

Paolo Di Stefano, University of L'Aquila, Italy

Anna Morabito, University of Salento, Italy

13:00 A computer-based method for the accurate analysis of the trilobate spouts found in the cathedral of Amiternum

Luca Di Angelo, University of L'Aquila, Italy
 Paolo Di Stefano, University of L'Aquila, Italy
 Alfonso Forgione, University of L'Aquila, Italy
 Emanuele Guardiani, University of L'Aquila, Italy
 Caterina Pane, University of L'Aquila, Italy

13:00 - 14:30

LUNCH

14:30 - 15:30

PLENARY SESSION

Room: Aula Magna, Università di Milano

Chair: Lucia Toniolo, Politecnico di Milano, Italy

Measuring thicknesses in multilayer heritage substrates: a non-invasive photonic approach by nonlinear optical microscopy

Marta Castillejo, Instituto de Química Física Rocasolano (CSIC), Spain

15:30 - 16:30

ROUND TABLE

Room: Aula Magna, Università di Milano

Gender equality in Cultural Heritage: which path towards inclusivity?

A WIE event in the frame of IEEE MetroArchaeo 2021.

Organized by *Dajana Cassioli, Paola Fermo, Sabrina Grassini, Roberta Di Pace, Leila Es Sebar.*

In line with the objectives of the WIE Commitment Chart "Steering girls to STEM", the purpose of the round table is to identify guidelines and prospects for growth and good practices that increase the inclusion of the women in the multidisciplinary world of the conservation of Cultural Heritage (material science, engineering, metrology, archaeology, conservation etc.).

16:30 - 16:50
COFFEE BREAK

16:50 - 18:30

SESSION 4.1

Special session - IoT based systems for the structural health monitoring, architectural survey and the analysis of cultural heritage building and archaeological sites

Room: Aula Magna, Università di Milano

Chairs: Francesco Lamonaca, University of Calabria, Italy
Gabriele Milani, Politecnico di Milano, Italy

16:50 A novel fast and low-cost masonry monitoring strategy and application on arches

Gabriel Stockdale, Masonry Methods, Inc., USA
Yu Yuan, Politecnico di Milano, Italy
Gabriele Milani, Politecnico di Milano, Italy

17:10 Radar Interferometric Experimental Reconstruction of Three-Dimensional Displacement Vectors and Mode Shapes for Masonry Constructions

Anna Castellano, Polytechnic University of Bari, Italy
Domenico Camassa, Polytechnic University of Bari, Italy
Aguinaldo Fraddosio, Polytechnic University of Bari, Italy
Mario Daniele Piccioni, Polytechnic University of Bari, Italy

17:30 Preliminary study of a mathematical model for the creation of a SHM system against river flooding

Carmelo Scuro, University of Calabria, Italy
Giuseppe Ali, University of Calabria, Italy
Francesco Demarco, University of Calabria, Italy
Francesco Lamonaca, University of Calabria, Italy
Renato S. Olivito, University of Calabria, Italy
Domenico Luca Carnì, University of Calabria, Italy

17:50 Preliminary study on a novel Optimal Placed Sensors method based on Genetic Algorithm

Carmelo Scuro, University of Calabria, Italy
Francesco Demarco, University of Calabria, Italy
Renato S. Olivito, University of Calabria, Italy

Peixuan Wang, Politecnico di Milano, Italy
 Gabriele Milani, Politecnico di Milano, Italy
 Shengcai Li, Yangzhou University, China

18:10 Simulation and Fast vulnerability analysis of a Chinese masonry pagoda

Peixuan Wang, Politecnico di Milano, Italy
 Gabriele Milani, Politecnico di Milano, Italy
 Carmelo Scuro, University of Calabria, Italy
 Francesco Demarco, University of Calabria, Italy
 Renato S. Olivito, University of Calabria, Italy
 Shengcai Li, Yangzhou University, China

16:50 - 18:30

SESSION 4.2

Special Session - Non-invasive systems and techniques for "on-site" monitoring and diagnosis

Room: Sala Crociera, Università di Milano

Chair: Livio D'Alvia, Sapienza University of Rome, Italy

16:50 Non-invasive techniques for characterization of original Roman mosaic fragments

Cristiana Radulescu, Romanian Chemical Society and Valahia University of Targoviste, Romania
 Rodica Mariana Ion, Valahia University of Targoviste, Romania
 Ioana Daniela Dulama, Valahia University of Targoviste, Romania
 Anca Irina Gheboianu, Valahia University of Targoviste, Romania
 Ioan Alin Bucurica, Valahia University of Targoviste, Romania

17:10 Non-invasive analyses of a multi-stratified archaeological and historical site: the Crypta Balbi case-study

Vincenzo Fioriti, ENEA CR Casaccia, Italy
 Ivan Roselli, ENEA CR Casaccia, Italy
 Angelo Tati, ENEA CR Casaccia, Italy
 Alessandro Colucci, ENEA CR Casaccia, Italy
 Massimiliano Baldini, ENEA CR Casaccia, Italy
 Alessandro Picca, ENEA CR Casaccia, Italy
 Antonino Cataldo, ENEA CR Casaccia, Italy
 Sara Forliti, ENEA CR Casaccia, Italy
 Mauro Marzullo, Museo Nazionale Romano, Italy

17:30 Permittivity of wood as a function of moisture for cultural heritage applications: a preliminary study

Livio D'Alvia, Sapienza University of Rome, Italy
 Emanuele Piuze, Sapienza University of Rome, Italy
 Andrea Cataldo, University of Salento, Italy
 Zaccaria Del Prete, Sapienza University of Rome, Italy

17:50 Application of a non-invasive measurement technique to detect anomalies in frescoes at the US Capitol

Amelia Vignola, The Catholic University of America, USA
 Francesco Corvaro, Università Politecnica delle Marche, Italy
 Joseph Vignola, The Catholic University of America, USA
 Diego Turo, The Catholic University of America, USA
 Barbara Marchetti, Università degli studi E-Campus, Italy
 Matteo Vitali, Università Politecnica delle Marche, Italy

18:10 Measurement of temperature gradients during Er:YAG laser irradiation of poly(vinyl alcohol)

Chiara Chillè, CNR-Istituto di Fisica Applicata "Nello Carrara", Italy
 Juri Agresti, CNR-Istituto di Fisica Applicata "Nello Carrara", Italy
 Daniele Ciofini, CNR-Istituto di Fisica Applicata "Nello Carrara", Italy
 Andrea A. Mencaglia, CNR-Istituto di Fisica Applicata "Nello Carrara", Italy
 Iacopo Osticioli, CNR-Istituto di Fisica Applicata "Nello Carrara", Italy
 Salvatore Siano, CNR-Istituto di Fisica Applicata "Nello Carrara", Italy

16:50 - 18:30

SESSION 4.3

Special session - Geomatics and cultural heritage: Multi-source data for recording, modeling, visualization and metric documentation of historical sites, monuments, structures and past landscape - PART 1

Room: Sala Napoleonica, Università di Milano

Chairs: Maria Grazia D'Urso, University of Bergamo, Italy
 Gabriele Bitelli, University of Bologna, Italy

16:50 From 3D surveying to replica, a resource for the valorisation of museum artifacts. The case of the bas-relief of Giovanni da Legnano in Bologna.

Gabriele Bitelli, University of Bologna, Italy

Valentina Alena Girelli, University of Bologna, Italy

Massimo Medica, Musei Civici d'Arte Antica/Istituzione Bologna Musei, Italy

Maria Alessandra Tini, University of Bologna, Italy

17:10 A 3D approach to investigate the burials: the virtual reconstruction of tb. 22 of necropolis of Piovego (PD)

Francesca Adesso, University of Padua, Italy

Emanuela Faresin, University of Padua, Italy

Giuseppe Salemi, University of Padua, Italy

17:30 Terrestrial laser scanning for 3D archaeological documentation. The prehistoric Cave of Sa Miniera de Santu Josi (Sardinia, Italy)

Ilenia Marini, Sapienza, University of Rome, Italy

Chiara Caradonna, University of Sassari, Italy

Maria Grazia Melis, University of Sassari, Italy

Carla Nardinocchi, Sapienza, University of Rome, Italy

17:50 Scans-to BIM for the Cultural Heritage: first results of a study case for a medieval church and its urban context

Maria Grazia D'Urso, University of Bergamo, Italy

Noemi Valdambrini, Professional Architect

Barbara Marana, University of Bergamo, Italy

Valerio Manzari, University of Cassino and Southern Lazio, Italy

18:10 Quantitative GIS-based analysis of archaeological data of the archaic state of Tell Mardikh/Ebla (3rd millennium BC): the Big-DEA project

Luca Peyronel, University of Milan Statale, Italy

Emanuele Mandanici, University of Bologna, Italy

Simone Mantellini, University of Bologna, Italy

Agnese Vacca, University of Milan Statale, Italy

Gabriele Bitelli, University of Bologna, Italy

20:30 – 23:00

GALA DINNER

Place: *Osteria Mamma Rosa*
Piazza Cincinnato 4, Milano

Technical Sessions - Friday, October 22

09:00 - 13:00

REGISTRATION

Room: Aula Magna, Università di Milano

09:20 - 10:20

PLENARY SESSION

Room: Aula Magna, Università di Milano

Chair: Paola Fermo, University of Milano, Italy

Archaeology and hard sciences: the case of the Aga Khan Necropolis at Aswan, Egypt

Patrizia Piacentini, Università degli Studi di Milano

10:20 - 11:40

SESSION 5.1

Special session - Geomatics and cultural heritage: Multi-source data for recording, modeling, visualization and metric documentation of historical sites, monuments, structures and past landscape - PART 2

Room: Aula Magna, Università di Milano

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

Gabriele Bitelli, University of Bologna, Italy

10:20 Ancient landscape reconstruction using archive data from the Pontine Plain (Italy): the Caprolace lagoon case study

Luca Alessandri, University of Groningen, Netherlands

Valerio Baiocchi, Sapienza University of Rome, Italy

Felicia Monti, Sapienza University of Rome, Italy

Hendrik Feiken, University of Groningen, Netherlands

Martijn Van Leusen, University of Groningen, Netherlands

10:40 From point cloud to video projection mapping: knowing modern architecture by using light projection

Andrea Martino, Università IUAV di Venezia, Italy

Caterina Balletti, Università IUAV di Venezia, Italy

11:00 The survey, the representation and the structural modeling of the S. Angelo roman bridge on the Savuto river (Scigliano, Calabria, Italy) for diagnostics and conservation aims

Serena Artese, University of Calabria, Italy

Manuela De Ruggiero, University of Calabria, Italy

Armando Taliano Grasso, University of Calabria, Italy

Alessandro Manna, University of Calabria, Italy

Raffaele Zinno, University of Calabria, Italy

11:20 A method to improve the accuracy of sparse UAV point cloud applied to the Amphitheater of Pompeii

Salvatore Barba, University of Salerno, Italy

Alessandro Di Benedetto, University of Salerno, Italy

Margherita Fiani, University of Salerno, Italy

Lucas Matias Gujski, University of Salerno, Italy

10:20 - 12:00

SESSION 5.2

Special session - Damage assessment: diagnosis and monitoring for the restoration, preventive conservation and maintenance of CH

Room: Sala Crociera, Università di Milano

Chairs: Natalia Rovella, University of Bologna, Italy

Luciana Randazzo, University of Calabria, Italy

10:20 A metabarcoding approach for the study of biodeterioration of ancient wall paintings in an Italian cave

Paola Cennamo, University of study Suor Orsola Benincasa, Italy

Daniele De Luca, University of Naples Federico II, Italy

10:40 Decay Assessment of Stone-Built Cultural Heritage: The Case Study of the Cosenza Cathedral Façade (South Calabria, Italy)

Antonio Donato, University of Calabria, Italy

Luciana Randazzo, University of Calabria, Italy

Michela Ricca, University of Calabria, Italy

Matteo Collina, University of Calabria, Italy

Nicola Ruggieri, Superintendence of Archeology, Fine Arts and Landscape for the Province of Cosenza, Italy

Francesco Dodaro, Superintendence of Archeology, Fine Arts and Landscape for the Province of Cosenza, Italy

Antonio Costanzo, Istituto Nazionale di Geofisica e Vulcanologia, Italy

Maria Fabrizia Buongiorno, Istituto Nazionale di Geofisica e Vulcanologia, Italy

Mauro Francesco La Russa, University of Calabria, Italy

11:00 Traffic-induced vibrations on cultural heritage in urban area: the case of Villa Farnesina in Rome

Antonio Costanzo, Istituto Nazionale di Geofisica e Vulcanologia, Italy

Sergio Falcone, Istituto Nazionale di Geofisica e Vulcanologia, Italy

Carmelo La Piana, Istituto Nazionale di Geofisica e Vulcanologia, Italy

Virginia Lapenta, Accademia dei Lincei, Italy

Massimo Musacchio, Istituto Nazionale di Geofisica e Vulcanologia, Italy

Antonio Sgamellotti, Accademia dei Lincei, Italy

Maria Fabrizia Buongiorno, Istituto Nazionale di Geofisica e Vulcanologia, Italy

11:20 Corrosion products characterisation aimed at restoration of Bronze Age metal artefacts from Garda Lake

Maria Labate, Università degli Studi di Torino, Italy

Carmela Sirello, Restauro Archeologico e Conservazione Opere d'Arte, Italy

Cristina Longhi, Soprintendenza Archeologia, Belle Arti e Paesaggio per Bergamo e Brescia

Maurizio Aceto, Università degli Studi del Piemonte Orientale, Italy

Lorenza Operti, Università degli Studi di Torino, Italy

Angelo Agostino, Università degli Studi di Torino, Italy

11:40 Development of a new procedure for the assessment of particulate matter (PM) carbonaceous fraction on stone materials exposed to atmospheric pollution

Andrea Bergomi, Università degli Studi di Milano, Italy

Valeria Comite, Università degli Studi di Milano, Italy

Cristina Della Pina, Università degli Studi di Milano, Italy

Cecilia Cavaterra, Università degli Studi di Milano, Italy

Vorne Luigi Gianelle, Università degli Studi di Milano, Italy

Paola Fermo, Università degli Studi di Milano, Italy

10:20 - 12:00

SESSION 5.3

Special session - Multiscale and multitemporal high resolution remote sensing and non-destructive testing for archaeology and monumental heritage: From research to preservation - PART 1

Room: Sala Napoleonica, Università di Milano

Chairs: Giovanni Leucci, UISPC-CNR, Italy

Salvatore Piro, ISPC-CNR, Italy

10:20 Integrated use of GPR and TDR for volumetric water content evaluation in wood structures

Filippo Comisi, University of Catania, Italy

Lara De Giorgi, National Research Council, Italy

Giovanni Leucci, National Research Council, Italy

10:40 Non Invasive diagnosis at the Basilica of Santa Croce (Lecce- Italy)

Anna Rita Carrozzo, National Research Council, Italy

Filippo Comisi, University of Catania, Italy

Lara De Giorgi, National Research Council, Italy

Giovanni Leucci, National Research Council, Italy

Lucrezia Longhitano, University of Catania, Italy

11:00 High resolution integrated geophysical investigations to enhance the knowledge of Tusculum archaeological site (Roma, Italy)

Salvatore Piro, National Research Council, Italy

Valeria Beolchini, EEHAR CSIC Roma, Italy

L. Peña-Chocarro, Escuela Española de Historia y Arqueología en Roma, Italy

Antonio Pizzo, EEHAR CSIC Roma, Italy

11:20 From historical surveys to innovative MT-InSAR techniques: structural monitoring of 20th century heritage buildings in Rome

Annalisa Mele, University of Naples Federico II, Italy

Ilaria Giannetti, University of Rome Tor Vergata, Italy

Fabio Di Carlo, University of Rome Tor Vergata, Italy

Andrea Miano, University of Naples Federico II, Italy

Manuela Bonano, CNR - Institute for Electromagnetic Sensing of the Environment, Italy

Riccardo Lanari, CNR - Institute for Electromagnetic Sensing of the Environment, Italy

Andrea Prota, University of Naples Federico II, Italy

Alberto Meda, University of Rome Tor Vergata, Italy

11:40 Fusion and integration of heterogeneous close range remote sensing and geophysical data. The case of Grumentum

Nicola Masini, CNR-ISPC (Istituto di Scienze del Patrimonio Culturale), Italy

Francesca Sogliani, University of Basilicata, Italy

Maria Sileo, CNR-ISPC, Potenza, Italy

Nicodemo Abate, CNR-IMAA, Italy

Maria Danese, CNR-ISPC, Potenza, Italy

Valentino Vitale, CNR-ISPC, Potenza, Italy

Rosa Lasaponara, CNR-IMAA, Italy

Salvatore Piro, CNR-ISPC, Italy

12:00 - 12:20**COFFEE BREAK****12:00 - 13:30****POSTER SESSION****LIVE DEMO SESSION****Room:** Università di Milano**Chairs:** Mauro Francesco La Russa, University of Calabria, Italy

Antonio Donato, University of Calabria, Italy

PST1 Geophysical survey in the area of aguglia d'agosta (Priolo Gargallo, Sicily)

Lara De Giorgi, National Research Council, Italy

Giovanni Leucci, National Research Council, Italy

Giovanni Fragalá, National Research Council, Italy

Daniele Malfitana, National Research Council, Italy

PST2 Non-destructive diagnosis of a hypogean mill

Anna Rita Carrozzo, National Research Council, Italy

Lara De Giorgi, National Research Council, Italy

Giovanni Leucci, National Research Council, Italy

Lucrezia Longhitano, University of Catania, Italy

PST3 Geophysical surveys in archaeological sites in Baucina (Palermo)

Giovanni Leucci, National Research Council, Italy

Antonino Cubito, SIGEO snc

Lara De Giorgi, National Research Council, Italy

Santi Pappalardo, SIGEO snc

Thalassia Giaccone, National Research Council, Italy
 Cosimo Greco, SIGEO snc
 Anna Rita Carrozzo, National Research Council, Italy
 Lucrezia Longhitano, University of Catania, Italy
 Filippo Comisi, University of Catania, Italy

PST4 Mapping of complex bedrock structure at the Manfredi Castle (Supersano, Lecce – South Italy)

Anna Rita Carrozzo, National Research Council, Italy
 Filippo Comisi, University of Catania, Italy
 Lara De Giorgi, National Research Council, Italy
 Giovanni Leucci, National Research Council, Italy
 Lucrezia Longhitano, University of Catania, Italy

PST5 The Project SAGAcE: a new instrumentation for gradiometric survey

Alberto Bucciero, National Research Council, Italy
 Lara De Giorgi, National Research Council, Italy
 Giovanni Leucci, National Research Council, Italy

PST6 HBIM to recovery the trulli in Apulia (Southern Italy)

Maurizio Delli Santi, CNR - ISPC, Italy

PST7 Integrated Archaeological and Geophysical Surveys in the Historical Center of Augusta (Eastern Sicily, Italy)

Giuseppe Cacciaguerra, National Research Council, Italy
 Lara De Giorgi, National Research Council, Italy
 Giovanni Fragalá, National Research Council, Italy
 Giovanni Leucci, National Research Council, Italy

PST8 Development of Storage and Assessment methods suited for organic Archaeological artefacts (StAr) – JPI-CH project

Erika Ribechini, University of Pisa, Italy
 Jeannette Jacqueline Lucejko, University of Pisa, Italy
 Marco Mattonai, University of Pisa, Italy
 Francesca Modugno, University of Pisa, Italy
 Gilles Chaumat, ARC-Nucléart, CEA-Grenoble, France
 Susan Braovac, Museum of Cultural History, University of Oslo, Norway
 Calin C. Steindal, Museum of Cultural History, University of Oslo, Norway
 Magdalena Zborowska, Poznan University of Life Science, Poland
 Henryk P. Dąbrowski, Archaeological Museum in Biskupin, Poland
 Mariusz Fejfer, Archaeological Museum in Biskupin, Poland

PST9 Pigments identification and analysis of the state of conservation of the decorative elements of the castle of Coca (XV-XVI AC, Segovia, Spain) by Raman Spectroscopy

Suset Barroso-Solares, University of Valladolid, Spain

Irene Mediavilla-Martinez, University of Valladolid, Spain

Carlos Sanz-Velasco, University of Valladolid, Spain

Angel Carmelo Prieto, University of Valladolid, Spain

Javier Pinto, University of Valladolid, Spain

PST10 Multianalytical approach to characterize composition and degradation processes of synthetic high-fashion textiles from the Nanni Strada Design Studio archives

Tommaso Nacci, University of Pisa, Italy

Deborah Roversi, University of Pisa, Italy

Ilaria Degano, University of Pisa, Italy

Barbara Ferriani, Barbara Ferriani srl, Italy

Nanni Strada, Nanni Strada Design Studio

Francesca Modugno, University of Pisa, Italy

PST11 Cleaning archaeological bones: Influence of solvents and water on microhardness

Noé Valtierra, Institut Català de Paleoeologia Humana i Evolució Social, Spain

Lloyd A. Courtenay, University of Salamanca, Spain

Albert Fabregat-Sanjuan, Universitat Rovira i Virgili, Spain

Lucía López-Polín, Institut Català de Paleoeologia Humana i Evolució Social, Spain

PST12 Terrestrial and UAV based infrared thermography for mapping and investigating the humidity of historical buildings. The case of the Castle in Calvello

Nicodemo Abate, CNR - Istituto di Metodologie per l'Analisi Ambientale, Italy

Rosa Lasaponara, CNR - Istituto di Metodologie per l'Analisi Ambientale, Italy

Nicola Masini, CNR - Istituto di Scienze del Patrimonio Culturale, Italy

PST13 Spectroscopic investigation on a XVII-XVIII century terracotta slab from Calabria, Southern Italy

Francesco Caridi, University of Messina, Italy

Giuseppe Acri, University of Messina, Italy

Giuseppe Paladini, University of Messina, Italy

Valentina Venuti, University of Messina, Italy

Vincenza Crupi, University of Messina, Italy

Pasquale Faenza, G. Rohlfs Museum of the Calabrian Greek Language, Italy

Domenico Majolino, University of Messina, Italy

PST14 A Proposed Framework For Affordable CAM Replication In Cultural Heritage

Georgios Korres, New York University Abu Dhabi, Arab Emirates

Christos Anagnostopoulos, Aegean university, Greece

Mohamad Eid, New York University Abu Dhabi, Arab Emirates

PST15 Non-invasive and multi-analytical approach to discovering "Old Believer Faith icons": A fruitful cooperation between Gomel (BL), Palermo (IT) and Wroclaw (PL)

Maria Luisa Saladino, University of Palermo, Italy

Fabrizio Lo Celso, University of Palermo, Italy

Francesco Armetta, University of Palermo, Italy

Veronica Ciaramitaro, University of Palermo, Italy

Gabriella Chirco, University of Palermo, Italy

Vladimir Gaishun, Francisk Skorina Gomel State University, Republic of Belarus

Dmitry Kovalenko, Francisk Skorina Gomel State University, Republic of Belarus

Alina Semchenko, Francisk Skorina Gomel State University, Republic of Belarus

Petr Tsalko, Vetka Museum of Old Believer Faith and Belarusian Traditions, Republic of Belarus

Dariusz Hreniak, Polish Academy of Sciences, Poland

PST16 Rehydroxylation: a promising technique for ceramic dating

Francesco Maspero, Università degli Studi di Milano Bicocca, Italy

Anna Galli, Università degli Studi di Milano Bicocca, Italy

Laura Panzeri, Università degli Studi di Milano Bicocca, Italy

Marco Martini, Università degli Studi di Milano Bicocca, Italy

PST17 Structural feature investigation of wooden artifacts through imaging techniques: a step forward in the preservation of historical musical instruments

Giacomo Fiocco, Università di Pavia, Italy

Sofia Ceccarelli, Università degli Studi di Roma Tor Vergata, Italy

Michela Albano, Università di Pavia, Italy

Tommaso Rovetta, Università di Pavia, Italy

Marco Malagodi, Università di Pavia, Italy

Noemi Orazi, Università degli Studi di Roma Tor Vergata, Italy

Stefano Paoloni, Università degli Studi di Roma Tor Vergata, Italy

PST18 Thermally Transferred Optically Stimulated Luminescence, TT-OSL: a study on the responsible traps

Giulia Tamburini, Università degli Studi di Milano Bicocca, Italy

Anna Galli, Università degli Studi di Milano Bicocca, Italy

Laura Panzeri, Università degli Studi di Milano Bicocca, Italy

Marco Martini, Università degli Studi di Milano Bicocca, Italy

PST19 Characterization of stone tesserae from "The Indian Triumph of Dionysus" Mosaic (Casignana, Reggio Calabria, Italy)

Natalia Rovella, University of Calabria, Italy

Marianna Musella, University of Calabria, Italy

Donatella Barca, University of Calabria, Italy

PST20 Structural health monitoring system design for historical heritage building

Domenico Luca Carnì, University of Calabria, Italy

Carmelo Scuro, University of Calabria, Italy

Renato S. Olivito, University of Calabria, Italy

Francesco Lamonaca, University of Calabria, Italy

Giuseppe Ali, University of Calabria, Italy

Simone Calà, University of Calabria, Italy

PST21 Portable Spectroscopic Techniques for the Non-invasive Identification of two historical yellow pigments: Applications and Practical Challenges

Veronica Ciaramitaro, University of Palermo, Italy

Francesco Armetta, University of Palermo, Italy

Viviana Mollica Nando, CNR - Istituto per i Processi Chimico Fisici Laboratorio di Tecniche Spettroscopiche, Italy

Rosa Celeste Ponterio, CNR - Istituto per i Processi Chimico Fisici Laboratorio di Tecniche Spettroscopiche, Italy

Maria Luisa Saladino, University of Palermo, Italy

PST22 Benchmark Based Selection Of Point Cloud Registration Algorithms For Cultural Heritage 3D Digitization

Georgios Korres, New York University Abu Dhabi, Arab Emirates

Mohamad Eid, New York University Abu Dhabi, Arab Emirates

Christos Anagnostopoulos, Aegean University, Greece

PST23 A procedure to monitor the critical aspects of the sampling in the authenticity tests by TL

Anna Maria Gueli, University of Catania, Italy

Giuseppe Stella, University of Catania, Italy

Stefania Pasquale, University of Catania, Italy

Giuseppe Politi, University of Catania, Italy

Carlo Trigona, University of Catania, Italy

PST24 Identification of natural dyes in historical tapestries, a LC-MS/MS approach

Anna Baroni, University of Milano, Italy
Valeria Comite, University of Milano, Italy
Vittoria Guglielmi, University of Milano, Italy
Mattia Casanova, Shimadzu Italia S.r.l.
Paolo Redegalli, Shimadzu Italia S.r.l.
Paola Fermo, University of Milano, Italy

PST25 Development of a novel probe for measuring emissivity and temperature during Raman spectroscopy

Chiara Calvagna, IFAC-CNR, Italy
Andrea Azelio Mencaglia, IFAC-CNR, Italy
Iacopo Osticioli, IFAC-CNR, Italy
Daniele Ciofini, IFAC-CNR, Italy
Salvatore Siano, IFAC-CNR, Italy

PST26 Analysis of the distribution of titanium oxide nanoparticles on paintings

Stefania Pasquale, University of Catania, Italy
Giuseppe Politi, University of Catania, Italy
Lucilla Pronti, INFN-Laboratori Nazionali di Frascati, Italy
Martina Romani, INFN-Laboratori Nazionali di Frascati, Italy
Giacomo Viviani, INFN-Laboratori Nazionali di Frascati, Italy
Mariangela Cestelli Guidi, INFN-Laboratori Nazionali di Frascati, Italy
Marco Angelucci, INFN-Laboratori Nazionali di Frascati, Italy
Anna Maria Gueli, University of Catania, Italy

PST27 Seismic behaviour and 3D reconstruction of Cultural Heritage: the Column of the Hera Lacinia Temple in Capo Colonna (Calabria, Southern Italy)

Antonio Costanzo, Istituto Nazionale di Geofisica e Vulcanologia, Italy
Antonio Giulio Cosentino, Associazione Nazionale dei Carabinieri di Brughiero, Italy
Pierdomenico Del Gaudio, Istituto Nazionale di Geofisica e Vulcanologia, Italy
Gregorio Aversa, Museo Archeologico Nazionale di Crotone, Italy
Francesco Pascuzzi, Corpo Nazionale dei Vigili del Fuoco, Italy

PST28 Terrestrial laser scanning for the modelling of indoor archaeological areas: two case-studies from Reggio Calabria, Italy

Dario Giuffrida, CNR, Istituto per i processi chimico-fisici, Italy
Viviana Mollica Nardo, CNR, Istituto per i processi chimico-fisici, Italy
Daniela Neri, Comune di Reggio Calabria – Macroarea Cultura e Turismo, Italy
Giovanni Cucinotta, Comune di Reggio Calabria – Macroarea Cultura e Turismo, Italy
Irene Vittoria Calabrò, Comune di Reggio Calabria – Macroarea Cultura e Turismo, Italy



Loredana Pace, Comune di Reggio Calabria – Macroarea Cultura e Turismo, Italy
Rosina Celeste Ponterio, CNR, Istituto per i processi chimico-fisici, Italy

PST29 Processing of XRF elementary data from the painted ceramic surface with innovative tools

Gabriella Chirco, University of Palermo, Italy
Giacomo Chiari, Getty Conservation Institute (Retired)
Delia F. Chillura Martino, University of Palermo, Italy

PST30 Chemical Analysis of prehistoric pottery complex of Valcorrente - Sicily (Italy)

Anna Maria Gueli, University of Catania, Italy
Orazio Palio, University of Catania, Italy
Maria Turco, Soprintendenza ai Beni Culturali di Catania, Italy
Stefania Pasquale, University of Catania, Italy
Giuseppe Stella, University of Catania, Italy
Quentin Lemasson, Centre de Recherche et de Restauration des Musée de France
Claire Pacheco, Centre de Recherche et de Restauration des Musée de France
Laurent Pichon, Centre de Recherche et de Restauration des Musée de France
Brice Moignard, Centre de Recherche et de Restauration des Musée de France
Giuseppe Politi, University of Catania, Italy

PST31 Investigation of archaeological amphorae from the Egadi battles

Francesco Armetta, University of Palermo, Italy
Veronica Ciaramitaro, University of Palermo, Italy
Małgorzata Sójka, University of Wrocław, Poland
Maria Luisa Saladino, University of Palermo, Italy
Eugeniusz Zych, University of Wrocław, Poland

PST32 Integration of geomatics acquisition and multi-source data for visualization and documentation of the finds in the Pauciuri archaeological site (Malvito, Calabria, Italy)

Serena Artese, University of Calabria, Italy
Sylvie Crogiez-Pétrequin, Université de Tours, France
Federica Caputo, Université de Tours, France
Armando Taliano Grasso, University of Calabria, Italy
Raffaele Zinno, University of Calabria, Italy

PST33 Technical observations about a possible new portion of the Aqua Iulia Roman aqueduct in the municipality of Ciampino (Italy)

Diego Blanco, Archeogeos, archeologia & geofisica, Italy

Luca Alessandri, Groningen Institute of Archaeology, University of Groningen, Netherlands

Valerio Baiocchi, Sapienza University of Rome, Italy

Piero Sebastiani Del Grande, Archeo.val. SRLS

Gabriella Serio, Soprintendenza Archeologia, Belle Arti e Paesaggio per l'area metropolitana di Roma e della Provincia di Rieti, Italy

Claudio Alimonti, Sapienza University of Rome, Italy

PST34 OSL dating of mortars from constructive phases of the old chapel San Breixo de Ouvigo (NW Spain)

Jorge Sanjurjo-Sanchez, University of A Coruña, Spain

Rebeca Blanco-Rotea, University of Santiago de Compostela, Spain

Jose Carlos Sánchez-Pardo, University of Santiago de Compostela, Spain

David Freire-Lista, University of Trás-os-Montes e Alto Douro, Portugal

PST35 Analysis of twelve wooden spear throwers covered with gilded copper from the Moche tomb of the Lady of Cao

Angel Bustamante, Universidad Nacional Mayor de San Marcos, Perú

Roberto Cesareo, University of Sassari, Italy

Regulo Franco J., PACEB Museo Cao (Fundación Wiese), Perú

Arabel Fernandez, Ministry of Culture, Lima, Perú

PST36 Analysis of the famous Moche head "Cabeza de Mono Dorada"

Roberto Cesareo, University of Sassari, Italy

Angel Bustamante, Universidad Nacional Mayor de San Marcos, Perú

13:30 - 14:30

LUNCH

14:30 - 15:50

SESSION 6.1

Special session - Analytical methods to investigate organic materials in cultural heritage: From archaeological biomaterials to modern art

Room: Aula Magna, Università di Milano

Chairs: Francesca Modugno, University of Pisa, Italy

Paola Fermo, Università degli Studi di Milano, Italy

14:30 Soft Ionization mass spectrometry of lipid residues in archaeological findings: ESI vs APCI

Francesco Saliu, DISAT-University of Milano Bicocca, Italy

14:50 A combined analytical and Bayesian approach to explore infant feeding practices in past populations

Carlo Coccozza, Ludwig-Maximilians-Universität München, Max Planck Institute for the Science of Human History, Germany

Ricardo Fernandes, Max Planck Institute for the Science of Human History, Germany, University of Oxford, UK, Masaryk University, Czech Republic

Paola Francesca Rossi, Parco Archeologico di Ostia Antica, Italy

Valeria Amoretti, Parco Archeologico di Pompei, Italy

Simona Altieri, Università della Campania, Italy

Maria Rosa Di Cicco, Università della Campania, Italy

Mary Anne Tafuri, Università La Sapienza, Italy

Carmine Lubritto, Università della Campania, Italy

15:10 Historical proteinaceous-based pictorial binders' analysis: a novel proteomic minimally invasive approach

Elena Carolina Lucia Rigante, Università degli Studi di Bari Aldo Moro, Italy

Cosima Damiana Calvano, Università degli Studi di Bari Aldo Moro, Italy

Tommaso R. I. Cataldi, Università degli Studi di Bari Aldo Moro, Italy

Luigia Sabbatini, Università degli Studi di Bari Aldo Moro, Italy

15:30 The combination of RPLC-ESI-FTMS/MS and m-CPBA epoxidation for the location and geometry assignment of double bonds in unsaturated fatty acyl chains of drying oils

Davide Coniglio, Università degli Studi di Bari Aldo Moro, Italy

Cosima Damiana Calvano, Università degli Studi di Bari Aldo Moro, Italy

Maria Masiello, Università degli Studi di Bari Aldo Moro, Italy

Ilario Losito, Università degli Studi di Bari Aldo Moro, Italy

Luigia Sabbatini, Università degli Studi di Bari Aldo Moro, Italy

Tommaso R. I. Cataldi, Università degli Studi di Bari Aldo Moro, Italy

14:30 - 16:10

SESSION 6.2

Special session - Recent advancements in dating methods

Room: Sala Crociera, Università di Milano

Chairs: Anna Galli, Università di Milano Bicocca, Italy

Marco Martini, Università di Milano Bicocca, Italy

14:30 New perspectives on an "old" technique: Lipari obsidian and Neolithic communities investigated by Fission Track Dating

Letizia Bonizzoni, University of Milan, Italy

Maria Clara Martinelli, Parco Archeologico delle Isole Eolie, Museo Luigi Bernabò Brea, Italy

Mauro Coltelli, Istituto Nazionale di Geofisica e Vulcanologia, Italy

Marco Manni, Istituto Nazionale di Geofisica e Vulcanologia, Italy

Maria Laura Balestrieri, IGG-CNR, Italy

Massimo Oddone, University of Pavia, Italy

Alessandra Guglielmetti, University of Milan, Italy

14:47 Evaluating the potential of mortar luminescence dating for building archaeology

Petra Urbanova, Università di Padova, Italy, Université Bordeaux Montaigne-CNRS, France

15:05 Evaluation of ATR-FTIR spectroscopy for distinguish anthropogenic and geogenic calcite

Sara Calandra, University of Florence, Italy

Emma Cantisani, Consiglio nazionale delle ricerche, Italy

Barbara Salvadori, Consiglio nazionale delle ricerche, Italy

Serena Barone, Istituto Nazionale di Fisica Nucleare, Italy

Lucia Liccioli, Istituto Nazionale di Fisica Nucleare, Italy

Mariaelena Fedi, Istituto Nazionale di Fisica Nucleare, Italy

Carlo Alberto Garzonio, University of Florence, Italy

15:22 Isotope imaging of ultra-traces by LA-fs HR-ICP-MS for U-series dating (U/Th) of archaeological biominerals: how far can we go?

Asmodée Galy, IRAMAT-CRP2A, Université Bordeaux Montaigne, France

Loïc Martin, Royal Society Newton International Fellow, Scottish Universities Environmental Research Centre, UK

Fanny Claverie, Université de Pau et des Pays de l'Adour, France

Edwige Pons-Branchu, Université Paris-Saclay, France

Chantal Tribolo, IRAMAT-CRP2A, Université Bordeaux Montaigne, France

Christophe Pecheyran, Université de Pau et des Pays de l'Adour, France

Norbert Mercier, IRAMAT-CRP2A, Université Bordeaux Montaigne, France

15:38 The metrology of luminescence dating

Antoine Zink, Centre de recherche et de restauration des musées de France

15:55 The activities of the LAMBDA (Laboratory of Milano Bicocca university for Dating and Archaeometry): what's new?

Laura Panzeri, Università di Milano-Bicocca, Italy

Anna Galli, Università di Milano-Bicocca, Italy

Francesco Maspero, Università di Milano-Bicocca, Italy

Miriam Saleh, Università di Milano-Bicocca, Italy

Marco Martini, Università di Milano-Bicocca, Italy

14:30 - 16:10

SESSION 6.3

Special session - Multiscale and multitemporal high resolution remote sensing and non-destructive testing for archaeology and monumental heritage: From research to preservation - PART 2

Room: Sala Napoleonica, Università di Milano

Chairs: Giovanni Leucci, UISPC-CNR, Italy

Salvatore Piro, ISPC-CNR, Italy

14:30 Preliminary results from GPR survey at the Roman villa of Caddeddi (Siracusa, Italy)

Denise Cali, University of South Florida, USA

Lara De Giorgi, National Research Council, Italy

Ivan Ferrari, National Research Council, Italy

Francesco Giuri, National Research Council, Italy

Stephan Hassam, University of South Florida, USA

Giovanni Leucci, National Research Council, Italy

Davide Tanasi, University of South Florida, USA

Paolino Trapani, University of Catania, Italy

14:50 Integrated use of multi-temporal multi-sensor and multiscale Remote Sensing data for the understanding of archaeological contexts: the case study of Metaponto, Basilicata

Nicodemo Abate, CNR-IMAA, Italy

Dimitris Roubis, CNR-ISPC, Italy

Valentino Vitale, CNR-ISPC, Italy

Maria Sileo, CNR-ISPC, Italy

Francesca Sogliani, University of Basilicata, Italy

Nicola Masini, CNR-ISPC, Italy

Rosa Lasaponara, CNR-IMAA, Italy

15:10 Warscape biography: from historical air-photos to Lidar data. The revealing of the Great War's permanences on the contemporary landscapes

Joel Aldrighettoni, University of Trento, Italy

Alessandra Quendolo, University of Trento, Italy

15:30 Marine archaeological investigation in the submerged Roman site of Baiae using parametric sub-bottom profiler system. Phlegrean Fields Archaeological Park (Naples, Italy)

Crescenzo Violante Violante, Institute of Cultural Heritage ISPC-CNR, Italy

Enrico Gallochio, Phlegrean Fields Archaeological Park, Italy

Fabio Pagano, Phlegrean Fields Archaeological Park, Italy

15:50 GPR 3D model in the area of the San Nicola church, Misterbianco (Sicily)

Patrizia Capizzi, Università di Palermo, Italy

Raffaele Martorana, University of Palermo, Italy

Carla Bottari, Istituto Nazionale di Geofisica e Vulcanologia, Italy

Alessandro Canzoneri, University of Palermo, Italy

Riccardo Civico, Istituto Nazionale di Geofisica e Vulcanologia, Italy

16:10 - 16:30

COFFEE BREAK

16:30 - 17:50

SESSION 7.1

Special session - Advancements in high resolution multi wavelength imaging techniques of painted surfaces

Room: Aula Magna, Università di Milano

Chairs: Nicola Ludwig, Università degli Studi di Milano, Italy

Marco Gargano, Università degli Studi di Milano, Italy

Emanuela Grifoni, Università degli Studi di Milano, Italy

16:30 Documenting Cultural Heritage in very hostile fruition contexts: the synoptic visualization of Giottesque frescoes in Milan by Multispectral and 3D Close-range Imaging

Emanuela Grifoni, University of Milan, Italy
 Marco Gargano, University of Milan, Italy
 Jacopo Melada, University of Milan, Italy
 Matteo Interlenghi, DeepTrace Technologies S.R.L., Italy
 Castiglioni Isabella, University of Milan-Bicocca, Milan, Italy
 Serena Romano Gosetti di Sturmeck, University of Lausanne, Switzerland
 Nicola Ludwig, University of Milan, Italy

16:50 Quantitative evaluation of the Reflectance Transformation Imaging and Normal Integration technique in profilometric application

Marco Gargano, University of Milan, Italy
 Eleonora Verni, University of Milan, Italy
 Giacomo Fiocco, University of Pavia, Italy
 Emanuela Grifoni, University of Milan, Italy
 Giulia Lippolis, Politecnico di Torino, Italy
 Nicola Ludwig, University of Milan, Italy
 Marco Malagodi, University of Pavia, Italy
 Tommaso Rovetta, University of Pavia, Italy
 Marco Pisani, Istituto Nazionale di Ricerca Metrologica, Italy
 Massimo Zucco, Istituto Nazionale di Ricerca Metrologica, Italy

17:10 Thermographic techniques and infrared reflectography, innovative results with pulsed lighting

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

17:30 Mapping large surfaces of cultural heritage buildings by infrared thermography

Gianluca Cadelano, ISAC CNR, Italy
 Giovanni Ferrarini, ITC-CNR, Italy
 Alessandro Bortolin, ISAC CNR, Italy
 Paolo Bison, CNR-ITC, Italy

16:30 - 17:50

SESSION 7.2

General Session

Room: Sala Crociera, Università di Milano

Chairs: Valeria Comite, University of Milan, Italy
Michela Ricca, University of Calabria, Italy

16:30 RestArt method: innovative high-precision mechatronic-based procedure for fragmented stone statues restoration

Pietro Nardelli, Architect
Martina Pavan, MA.CO.RE'. s.r.l., Italy
Giulia Pompa, MA.CO.RE'. s.r.l., Italy
Silvia Borghini, Museo Nazionale Romano, Italy
Vincenzo Fioriti, ENEA, Italy
Angelo Tati, ENEA, Italy
Alessandro Colucci, ENEA, Italy
Massimiliano Baldini, ENEA, Italy
Alessandro Picca, ENEA, Italy
Ivan Roselli, ENEA, Italy

16:50 Raman Spectroscopy Study of Ancient Vaccaeï (s. IV-I BC) Glass Beads found at the Necropolis of "Las Ruedas" (Padilla de Duero, Valladolid, Spain)

Javier Pinto, University of Valladolid, Spain
Suset Barroso-Solares, University of Valladolid, Spain
Jorge Souto, University of Valladolid, Spain
Elvira Rodriguez, University of Valladolid, Spain
Carlos Sanz-Minguez, University of Valladolid, Spain
Angel Carmelo Prieto, University of Valladolid, Spain

17:10 Change in colouration of medieval fresco painting – a study of frescoes from St. George's Cathedral of Yuryev Monastery

Olga Philippova, Joint Institute for Nuclear Research, Russia
Andrey Dmitriev, Joint Institute for Nuclear Research, Russia
Tatiana Tsarevskaya, State Institute for Art Studies, Russia
Svetlana Dmitrieva, Dubna State University, Russia

17:30 Real-time detection of salts content in waterlogged archaeological wood by evanescent field dielectrometry (EFD): preliminary results

Sveva Longo, CNR-ISPC, Italy
Enza Fazio, University of Messina, Italy

Benedetto Pizzo, CNR-IBE, Italy
Cristiano Riminesi, CNR-ISPC, Italy

16:30 - 17:50

SESSION 7.3

Special session - Multiscale and multitemporal high resolution remote sensing and non-destructive testing for archaeology and monumental heritage: From research to preservation - PART 3

Room: Sala Napoleonica, Università di Milano

Chairs: Giovanni Leucci, UISPC-CNR, Italy

Salvatore Piro, ISPC-CNR, Italy

16:30 Proximity remote sensing: preliminary results at the Batia Church (Tortorici, Sicily)

Sebastiano D'Amico, University of Malta, Malta

Emanuele Colica, University of Malta, Malta

Luciano Galone, University of Malta, Malta

Raffaele Persico, University of Calabria, Italy

Valentina Venuti, University of Messina, Italy

Francesco Caridi, University of Messina, Italy

Salvatore Foti, Centro Storia Patria, Italy

Claudia Cantarella, Comune di Tortorici, Italy

16:50 Integrated geophysical and geomatics study at Xrobb l-Ghagin archaeological site: preliminary results

Emanuele Colica, University of Malta, Malta

Sebastiano D'Amico, University of Malta, Malta

Luciano Galone, University of Malta, Malta

David Cardona, Heritage Malta

Joseph Caruana, Heritage Malta

Katya Straud, Heritage Malta

Giovanni Leucci, CNR, Italy

Daniela Farrugia, University of Malta, Malta

Pauline Galea, University of Malta, Malta

17:10 Integrated geophysical and geomatic studies at Ghar Dalam Cave, Malta's oldest prehistoric site

Luciano Galone, University of Malta, Malta

Emanuele Colica, University of Malta, Malta

Sebastiano D'Amico, University of Malta, Malta

David Cardona, Heritage Malta
Paul Portelli, Heritage Malta
Francesco Fontanelli, Heritage Malta
John J Borg, Heritage Malta

17:30 Preliminary geophysical investigation in the archaeological site of Bocca delle Menate (Comacchio, FE)

Enzo Rizzo, University of Ferrara, Italy
Rachele Dubbini, University of Ferrara, Italy
Luigi Capozzoli, CNR- IMAA, Italy
Gregory De Martino, CNR- IMAA, Italy
Giacomo Fornasari, University of Ferrara, Italy
Leonardo Farinatti, University of Ferrara, Italy
Enrico Ferrari, University of Ferrara, Italy
Jessica Clementi, University of Ferrara, Italy
Francesca Romano Fiano, University of Ferrara, Italy
Matteo Lombardi, University of Ferrara, Italy

17:50 - 18:10

CLOSING AND AWARD CEREMONY

Room: Aula Magna, Università di Milano

Paola Fermo, *University of Milano, MetroArchaeo 2021 General Chair*
Pasquale Daponte, *University of Sannio, MetroArchaeo 2021 General Chair*
Anna Galli, *Associazione Italiana di Archeometria, AIAR*
Marco Martini, *Associazione Italiana di Archeometria, AIAR*
Mauro Francesco La Russa, *University of Calabria*
Antonio Donato, *University of Calabria*