



5th Historic Mortars Conference

HMC 2019

Information & Outcomes

University of Navarra, Pamplona

19th – 21st June, 2019

5th Historic Mortars Conference at the University of Navarra

The Department of Chemistry of the University of Navarra has organized the 5th Historic Mortars Conference (HMC 2019) which took place in Pamplona, Spain, 19th-21st June, 2019. The Conference has been hosted by the research group of Heritage, Materials & Environment and has been chaired by Professor José Ignacio Álvarez.

This event was co-sponsored by **RILEM**.

The 5th HMC 2019 has focused on research about aspects concerning technology and characterization of historic mortars, significance of the mortars and conservation and restoration issues in historic masonry structures and archaeological sites, historic plasters, design and preparation of preservation products, repair materials (mortars, renders, plasters and grouts) and test methods (for historic and repair mortars).

The HMC 2019 has been open to scientists, architects, restorers, conservators, historians, archaeologists, heritage professionals, companies and cultural stakeholders.

Organizing & Scientific Committees

Organizing Committee (University of Navarra)

- José Ignacio Álvarez
- José María Fernández
- Íñigo Navarro
- Adrián Durán
- Rafael Sirera
- Jesús Fidel González
- Burcu Taşçı
- Cristina Luzuriaga
- Joan Puig
- Max Renaud Petitjean
- Alessandro Speziale

Scientific Committee

- Alvarez, José Ignacio. University of Navarra, Spain
- Biçer-Şimşir, Beril. The Getty Conservation Institute, U.S.A.

- Bokan Bosiljkov, Violeta. University of Ljubljana, Slovenia
- Faria, Paulina. Universidade Nova de Lisboa, Portugal
- Groot, Caspar. Delft University of Technology, Netherlands
- Gulotta, Davide. The Getty Conservation Institute, U.S.A.
- Hughes, John. University of the West of Scotland, U.K.
- Ioannou, Ioannis. University of Cyprus, Cyprus
- Maravelaki-Kalaitzaki, Pagona-Noni. Technical University of Crete, Greece
- Martínez Ramírez, Sagrario, Consejo Superior de Investigaciones Científicas, IEM-CSIC, Spain
- Pachta, Vasiliki. Aristotle University of Thessaloniki, Greece
- Papayianni, Ioanna. Aristotle University of Thessaloniki, Greece
- Pavia, Sara. Trinity College Dublin, Ireland
- Rodríguez Navarro, Carlos. University of Granada, Spain
- Santos Silva, António. National Laboratory for Civil Engineering, LNEC, Portugal
- Secco, Michele. Università degli Studi di Padova, Italy
- Starinieri, Vincenzo. Sheffield Hallam University, U.K.
- Stefanidou, Maria. Aristotle University of Thessaloniki, Greece
- Theodoridou, Magdalini. Cardiff University, U.K.
- Valek, Jan. Academy of Sciences, Czech Republic
- Van Hees, Rob P.J. Delft University of Technology, Netherlands
- Veiga, Maria Rosário. National Laboratory for Civil Engineering, LNEC, Portugal
- Velosa, Ana. University of Aveiro, Portugal

Former editions of HMC

The **four previous** conferences were chaired by:

- **Dr. Rosário Veiga** (Lisbon, HMC 2008, at LNEC, National Laboratory for Civil Engineering)
- **Dr. Jan Válek** (Prague, HMC 2010, Institute of Theoretical and Applied Mechanics of the Academy of Sciences of the Czech Republic)
- **Dr. John Hughes** (Glasgow, HMC 2013, University of the West of Scotland)
- **Professor Ioanna Papayianni** (Santorini, HMC 2016, Laboratory of Building Materials, Aristotle University of Thessaloniki)

Topics for HMC 2019

The proposed topics for this edition of the Conference were:

- T 1** Topic 1: Earth-based plasters and mortars on archaeology and historic constructions
- T 2** Topic 2: Use of nanotechnology for high performance mortars
- T 3** Topic 3: Gypsum-based plasters and mortars in historical constructions
- T 4** Topic 4: Functional mortars for the conservation of historic and modern cultural heritage structures
- T 5** Topic 5: Characterization of historic mortars and masonry structures. Sampling and test methods
- T 6** Topic 6: Historic production, processing and application of mortars, renders and grouts. Lime technologies
- T 7** Topic 7: Mortars in archaeological sites. Construction history. Archaeometry
- T 8** Topic 8: Dating of historic mortars
- T 9** Topic 9: Natural and Roman cement mortars
- T 10** Topic 10: Conservation issues concerning mortars, plasters, renders and grouts. Diagnosis. Decay and damage mechanisms. Case studies
- T 11** Topic 11: Preservation. Consolidation materials and techniques. Development of new products. Preventive conservation
- T 12** Topic 12: Repair mortars and grouts. Requirements and design. Compatibility issues. Durability and effectiveness. Repair mortars: Adequacy of testing procedures

Besides, some thematic sessions have been suggested as described below.

Thematic Session 1:

Earth-based plasters and mortars on archaeology and historic constructions

Chaired by: **Paulina Faria** (Associate Professor, NOVA University of Lisbon)

- Characterization of archaeological and historic construction old earth plasters
- New earth sacrificial plasters for archaeology protection
- Earth mortars for stone masonry repair
- Earth mortars for old earthen construction repair (adobe masonry, rammed earth, cob walls)
- New earth-based plasters for historic constructions
- Protection and consolidation of earthen plasters and mortars

Thematic Session 2:

Use of nanotechnology for high performance mortars

Chaired by: **Maria Stefanidou** (Director of the Laboratory of Building Materials, AUTH)

- Nanoparticles adding special properties to mortars such as:
 - hydrophobicity,
 - cohesion,
 - strength,
 - durability to salts or ageing cycles
 - restrictions and problems to their use
- Nanotechnologies for monitoring mortars
 - AFM
 - NANOINDENTATION
 - TEM/SEM etc.

Thematic Session 3:

Gypsum-based plasters and mortars in historical constructions

Chaired by: **Teresa Freire** (Laboratório Nacional de Engenharia Civil, LNEC)

Gypsum is among the most ancient materials that were used in the construction of human dwellings. With this session, it was intended to bring together experts on the topic under analysis, to promote discussion and to maximize scientific interaction.

The topics covered have been:

- Characterization studies - methodology and experimental results
- Use in archaeological sites
- Repair solutions/products for decorative plasterwork, plastered surfaces, masonry mortars, joint mortars, ...
- Studies on composition, physical and mechanical properties, compatibility, durability
- Protection and consolidation
- Anomalies; Diagnosis; Interventions; Repair solutions; Case studies
- Technology of production and application

Thematic Session 4:

Functional mortars for the conservation of historic and modern cultural heritage structures

Chaired by: **Ioannis Karatasios** (Researcher, Institute of Nanoscience and Nanotechnology, NCSR "Demokritos". Athens, Greece)

This session has dealt with the design, development and evaluation of modern conservation mortars that incorporate new functionalities, such as:

- self-healing,
- insulation,
- self-sensing,
- self-cleaning, etc.

Schedule

HMC 2019. University of Navarra. Pamplona, 19 th - 21 st June 2019											
Tuesday, 18 th		Wednesday, 19 th		Thursday, 20 th			Friday, 21 st				
	09.00-09.30	Opening Session Main Auditorium		09.00-11.00	T 12.2 Main auditorium	T 5.2 Amphitheatre Room 10	T 6 Room 21	09.30-11.00	T 12.4 Main auditorium	T 11.2 Amphitheatre Room 10	T 7.2 Room 21
		Inaugural Conference Main Auditorium									
	11.00-11.30		Coffee Break		11.00-11.30			Coffee Break			
	11.30-13.30	T 5.1 Main auditorium	T 10 Amphitheatre Room 10	11.30-13.30	T 2 Main auditorium	T 3.1 Amphitheatre Room 10	T 7.1 Room 21	11.30-12.30	T 4.2 Main Auditorium	T 3.2 Amphitheatre R 10	T 9.2 Room 21
		Lunch			13.30-15.00			Lunch			
	15.00-17.00	T 12.1 Main auditorium	T 1 Amphitheatre Room 10	15.00-16.30	T 9.1 Main auditorium	T 4.1 Amphitheatre Room 21	T 5.3 Room 21	15.00-15.30	Bus to Olite		
		Coffee Break		16.30-17.00			Technical Presentations by Gordillo's Cal de Morón and by SINT Technology				
17.30-19.30	Registration Hall of Science Library building		17.00-17.30	17.00-17.30			Coffee Break				
	17.30-18.30	T 11.1 Main auditorium	T 8 Amphitheatre Room 10	18.00-19.00	T 12.3 Main auditorium		POSTERS Hall of Auditorium	17.30-18.00			
		19.30-20.30			Technical visit: Cloister of the Cathedral of Pamplona		20.00-23.00			Guided visit to the Museum of the University of Navarra. Gala dinner	
							18.00-21.30				
							21.30-22.00				

Inaugural conference

“Historic mortars of the Holy Aedicule and the Tomb of Christ supporting the design and evaluation of performing and compatible restoration mortars and revealing the history of the monument” by Prof. Antonia Moropoulou of the National Technical University of Athens.



Antonia Moropoulou, is currently Professor at the National Technical University of Athens (NTUA), Greece and President of the General Assembly of the Technical Chamber of Greece. She is a Chemical Engineer, PhD, Full Professor at the Section of Materials Science and Engineering of the NTUA School of Chemical Engineering and Director of the NTUA Materials Science and Engineering Laboratory. She is Studies Director of the NTUA Master Program “Protection of Monuments” - Direction “Materials and conservation Interventions”. She has served as NTUA Vice Rector of Academic Affairs (2010-2014) and Vice President of the European Society for Engineering Education (SEFI) (2013-2016). She was elected as Contracted Professor in IUAV University of Venice (1993), Visiting Professor at Princeton University (1995-1996). She is a world class expert in building materials and the preservation of monuments that comprise the World’s Cultural Heritage. She has worked on restoration projects in Hagia Sophia in Istanbul, the Holy Aedicule of the Holy Sepulchre in Jerusalem, the Medieval City of Rhodes, and other major historic cities monuments and sites in Greece and the Mediterranean. She has been scientific coordinator of more than 80 National, European and International research competitive programs and author of 5 books, 22 chapters in books, editor of 20 special editions and author of more than 500 scientific publications, with more than 4000 citations by other authors, 21,000 reads and 2 billion views. In 2012 she was awarded the ‘YPATIA’ Award by the ‘Association of Hellenic Women Scientists’. In 2017 she was honoured the SEFI Fellowship Award. She was the Chief Scientific Supervisor of the project for the “Conservation, reinforcement and repair interventions for the rehabilitation of the Holy Aedicule of the Holy Sepulchre in the All-Holy Church of Resurrection in Jerusalem”, which was recently implemented in the framework of the common agreement of the Status Quo Christian Communities, following invitation by the Greek-Orthodox Patriarch of Jerusalem.

Programme

Wednesday, 19th June

09.00-09.30 Opening Session (Auditorium)

09.30-11.00 Inaugural Conference (Auditorium)

Prof. Antonia Moropoulou

National Technical University of Athens, Greece

Historic mortars of the Holy Aedicule and the Tomb of Christ supporting the design and evaluation of performing and compatible restoration mortars and revealing the history of the monument (*A. Moropoulou et al.*)

11.00-11.30 Coffee Break

11.30-13.30	Topic 5.1 (Auditorium) Chair: Ioanna Papayianni, Sagrario Martínez-Ramírez	Topic 10 (Amphitheatre) Chair: John Hughes, Davide Gulotta
11.30	A map is worth a thousand pictures: The application of FTIR-mapping to the analysis of petrographic thin sections of historical and experimental mortar	Evolution of mortars composition and characteristics during the 20 th century – Study of Portuguese buildings awarded with Architecture Valmor Prize
11.45	Calcite or quartz powder as aggregate of Roman plasters (Lombardy, Italy)	The restoration of the church of Our Lady of the Assumption, Dauis, Bohol, Philippines
12.00	Characterisation methodology for lime based materials – A case study of the Rajagopuram of Pundarikaksha temple in Tamil Nadu, India	The analysis of the proportion of mortar for Japanese roof tile (Ibushikawara) in Taiwan by applying of Taguchi Method
12.15	Characterisation of concrete structures along the Reschen frontier, South Tyrol, Italy	The use of dolomitic lime in mortar samples from a 15th-century buttress of York Minster (York, UK)
12.30	Chemical, mineralogical and hydraulic characteristics of Roman mortars in Turkey	Digital image analysis as basic for the evaluation of mortars in architectural conservation
12.45	Provenance study of raw materials used for lime making at Prague Castle during Medieval times	Decorative renders simulating stone of middle 20 th century in the region of Lisbon

13.30-15.00 Buffet Lunch

15.00-17.00	Topic 12.1 (Auditorium) Chair: Jan Válek, Enrico Sassoni	Topic 1 (Amphitheatre) Chair: Paulina Faria, Noni Maravelaki
15.00	Characterization and compatibility assessment of commercial stone repair mortars	Earth-based plasters – the effect of anhydrite stabilization.
15.15	Improvements to water, salt-scaling and freeze-thaw resistances of historic mortar replication mixes	Similar appearance of mortar and brick masses in Algiers Casbah houses during the Ottoman period (16 th - early 18 th centuries)
15.30	Use of ultrafine mafic rocks for the enhancement of carbonation reaction in lime renders	Assessment of adhesive strength of an earth plaster on different substrates through different methods
15.45	The impact of elevated temperatures on the properties of lime-based mortars	Earth-based plasters: the influence of clay mineralogy
16.00	A grout and mortar system for fine cracks and shallow surface fills in Carrara marble	Earth-based and binder-based mortars comparison
16.15	An innovative way for testing adhesion of non-structural injection grouts for the stabilisation of historic plasters	Earth-based and current plasters: assessment of efficiency and contribution to indoor air quality
16.30	NHL-based plasters and renders – Assessing the influence of mixing method on workability and hardened mortar properties	Earthen plasters based on illitic clayish earth – the influence of calcitic lime addition
16.45	Comparing the moisture permeability of limecrete and concrete floor slabs	Rescuing the manufacturing process of traditional mortars present on XIX-century earthen buildings in Brazil

17.00-17.30 Coffee Break

17.30-18.30	Topic 11.1 (Auditorium) Chair: Chiara Pasian, Sara Pavía	Topic 8 (Amphitheatre) Chair: Caspar Groot, António Santos Silva
17.30	Comparative analysis of permeability values of traditional aerial lime mortars for preventive conservation	Structural characterization and thermal decomposition of lime binders allow accurate radiocarbon age determinations
17.45	Comparative study of ethyl silicate versus acrylic resin consolidation of wall painting with high water and salts contents: a case study at the Chapter Hall of Chartres cathedral	An Ecology of Castle Construction: geoarchaeology, archaeobotany & radiocarbon analysis in the ecotone of Lochindorb Castle
18.00	Preliminary results on the use of ammonium phosphate solutions for the consolidation of lime-based mortars	The latest advances on Single grain OSL dating of mortars and their integration in early medieval archaeology
18.15		Characterization and Radiocarbon dating of complex mortars in Historic Buildings

19.30-20.30	Visit to the restoration of the Cloister of the Cathedral of Pamplona Meeting Point: atrium of the Cathedral
--------------------	--

Thursday, 20th June

09.00-11.00	Topic 12.2 (Auditorium) Chair: Paulina Faria, Véronique Vergès-Belmin	Topic 5.2 (Amphitheatre) Chair: Rosário Veiga, Johannes Weber	Topic 6 (Room 21) Chair: Albert Jornet, Mar Barbero
09.00	Impact of guar gum and chitosan ethers on physico-mechanical properties and durability of natural hydraulic lime mortars	Roman vs. medieval crushed brick lime mortars: A comparative study	Blast furnace slag in historic mortars from Bergslagen, Sweden
09.15	Lime-based grouts for architectural surface repair. Comparison of their performance by using laboratory and field test methods	Analytical and chromatic characterization of the interior walls finishes in the Batlló House of Gaudí in Barcelona. A surprising discovery	A Mortar Maker's guide to evolving mortar specifications in 18 th and 19 th C France and England and their implications today
09.30	Limestone-filled, hydraulic-lime mortars for historic and traditional fabrics	Mineralogical characterization of historical cement-based mortar from Rupnik military fortification line	Preliminary research on potential raw material sources for dolomitic lime mortars at St John convent at Müstair, Switzerland
09.45	Lime based mortars. Relationships between composition parameters and mechanical strength	Algarve vernacular architecture facade ornaments: chemical, physical and mechanical characterization	Pozzolanicity beyond Vitruvius: insights into the exploitation of reactive silicates throughout the Roman world
10.00	Lime-pozzolan injection grouts with ovalbumin and ethanol added as water-reducing agents: grout design and assessment of the mineralogical evolution	Medieval mortar, stone and repair mortar of an abandoned Medieval Church, compatibility issues: example from Hungary	Composition and technology of the 17 th century stucco decorations at Červená Lhota Castle in the southern Bohemia
10.15	Microstructure of lime pastes with the addition of vegetable oils	Interpretation of scientific data derived from analytical techniques used in the characterisation of Roman mortars	Hot applied lime mortar – assessment of a traditional technique used in modern restoration
10.30	Effects of natural zeolite addition to lime based render layers for restoration of historical buildings		
10.45	Formulated lime mortars as a sustainable practice for Built Heritage conservation in Mexico		

11.00-11.30 Coffee Break

11.30-13.30	Topic 2 (Auditorium) Chair: Maria Stefanidou, Maria Amenta	Topic 3.1 (Amphitheatre) Chair: Teresa Freire, David Sanz	Topic 7.1 (Room 21) Chair: Vassiliki Pachta, Kristin Balksten
11.30	Enhancing clay mortars' properties	Stucco marble in the Portuguese architecture: first insights in mineralogical, physical and mechanical properties	Technical analysis on materials and characteristics of mortar-based compounds in Roman and Late antique Aquileia (Udine, Italy). A preliminary report of the results
11.45	Active photocatalytic-superhydrophobic coating with TiO ₂ -ZnO nano-heterostructures for lime mortars	Detailed studies of gypsum renders and plasters from the Ishrat Khane Mausoleum in Samarkand, Uzbekistan	M.N.I.A.R. techniques of macroscopic characterization from the colorimetry and chromatographies analysis applied to the mortars in the archaeological site of Los Hitos (Arigotas, Toledo, Spain)
12.00	Evaluation of SiO ₂ nanoparticles as additive for lime mortars: changes in the microstructure and mechanical properties	Historic gypsum mortars from Emilia Romagna (Italy). Mineralogical and petrographic analysis	Insights into Carolingian construction techniques – results from archaeological and mineralogical studies at Münstair Monastery, Grisons, Switzerland
12.15	Evaluation of the influence of nano-SiO ₂ and nano-Al ₂ O ₃ in physico-mechanical properties and microstructure of calcareous clay	The use of stucco-marble to restore veined polished limestone. The case of the pavement in the major sacristy of the Cathedral of Seville.	Animal, vegetable or mineral? Characterising shell-lime, maerl-lime and limestone-lime mortar evidence from the Late Norse and Medieval site of Tuquoy, Orkney
12.30	Studies of the mechanical properties of lime mortars treated with alkaline earth hydroxide nanoparticles	Thermal monitoring of a traditional gypsum oven in Ribera d'Ondara (Lleida) and simulation of the calcination process	Analysis of mortars from the Tarragona Roman Aqueduct as a study case to document original building and restoration materials
12.45	Synthesis of nanolime in sugary solutions		Characterisation of Roman mortar from the archaeological site of Mirobriga
13.00	The use of nanoparticles to improve the performance of restoration mortars		
13.15	Study of the role of different nanoparticles in lime pastes		

13.30-15.00 Buffet Lunch

15.00-16.30	Topic 9.1 (Auditorium) Chair: Michele Secco, Giulia Ricci	Topic 4.1 (Amphitheatre) Chair: Ioannis Karatasios, Íñigo Navarro-Blasco	Topic 5.3 (Room 21) Chair: Roberto Bugini, Giovanni Cavallo
15.00	European natural cements – Their key technical properties under standardized conditions	Hydrophobized lime grouts prepared with microsilica and superplasticizers	Petrography of Historic mortar materials: Polarising light microscopy as a method for characterising lime-based mortars
15.15	From marlstone to rotary kilns – the early development of Portland cement	Self-cleaning of previously healed historic mortars with multi-functional coatings	Colors and grains: study on the composition and characteristics of mortars of the 18 th and 19 th centuries in São Luís, Maranhão – Brazil
15.30	Drying shrinkage of historic Portland cements: factors to be considered for successful repair	Use of natural zeolite aggregate in restoration lime renders	DB-Heritage: A database of mortars composition and characteristics
15.45	Restoration techniques using 1930's Portland cements at Porte de l'Est in the Roman city-wall of Aventicum, Switzerland	Addressing safety and durability requirements of architectural heritage by developing functional conservation mortars	Characterization of lime mortar from a Tabique Pampangó Wall Technique in the Philippines
16.00	Repairs to historic concrete pavement at Jacob Riis Park utilizing Natural, Roman and Portland cements	Autogenic vs. autonomic self-healing process in conservation mortars with crystalline admixture	
16.15	The use of mortars in Palau Güell by Antoni Gaudí	SRG composite systems for strengthening masonry structures: from laboratory to field applications	

16.30-16.45 **Gordillo's Cal de Morón presentation (Amphitheatre)**
ARTISAN LIME. From tradition to innovation. Back to origin

16.45-17.00 **Technical Presentation by SINT Technology (Room 21)**
Drilling Resistance Measurement System, DRMS

17.00-17.30 **Coffee Break**

17.30-18.00 **Workshop by Gordillo's Cal de Morón (Room 14)**
Practical applications of putty lime: design of mortars

18.00-18.45	POSTERS (Hall of the Amphitheatre) Chair: José M. Fernández	Topic
	Macroscopic high resolution techniques to the characterization of the mortars structures in the Sé-Cathedral's archaeological complex in Idanha-a-Velha	T 1
	Figural Renaissance stucco in the Czech Republic – Technological and material characterisation	T 3
	Fibre reinforced mortars for cultural heritage protection	T 4
	Roman mortars of floor substrates and walls from Arroyo de la Dehesa de Velasco site: petrographic and mineralogical characterization	T 5
	Hydraulic mortars at Caesarea: underwater and on-land pozzolanic reactions through chemical and mineralogical examinations of Herodian, Roman, and Byzantine constructions	T 5
	Characterization of historical mortars from the Portuguese Citadel in Ksar Seghir (Morocco)	T 5
	16 th century decorative elements in the Convento dos Capuchos (Serra de Sintra, Portugal)	T 5
	Warm applied Mortar (WAM) – An insight into the historical technique of “Heiße Speis” and its use for renders	T 6
	Mortars and renders from Roman villa Horta da Torre (Portugal): a multi-analytical approach	T 6
	Characterization of historical mortars from the Botanic Garden of the National Palace of Queluz	T 7
	Petrographic and chemical-mineralogical characterization of plaster and mortar from the Renaissance cistern at Amaiur Castle (Navarre, Spain)	T 7
	Characterization of historic mortars: techniques used to establish a construction chronology. Case study: “Aragoneses mill” as it belongs to popular architectural heritage	T 8
	Towards an integrated approach to mortar analysis – The Pompei Arch&Lab Project	T 10
	Practical application of lime-pozzolan mortars to damp masonry	T 10
	Calcium alkoxide as an innovative product to consolidate cracks in cement mortars	T 11

18.00-18.45	Topic 12.3 (Auditorium) Chair: Cristiana Nunes, Ana Velosa
18.00	Efficiency of field test methods for evaluation of non-structural injection grouts in Slovenian conservation practice
18.15	Evaluation of the rheological behaviour of a natural additive of vegetal origin in restoration lime mortars as an ecological and sustainable alternative
18.30	Diethyl oxalate-based microgrouts in calcium carbonate systems: formulation, field testing and mineralogical characterisation

20.00-23.00	Guided visit to the Museum University of Navarra (MUN). Gala dinner Meeting point: Esplanade at the entrance of the Museum
-------------	--

Friday, 21st June

09.30-11.00	Topic 12.4 (Auditorium) Chair: Cristina Galacho, Esther Ontiveros	Topic 11.2 (Amphitheatre) Chair: Violeta Bokan-B., Ana González Serrano	Topic 7.2 (Room 21) Chair: Caspar Groot, Duygu Ergenç
09.30	The initial reactions of lime-pozzolan pastes for conservation of masonry	Frost resistance of reproduced mosaic mortars	Analysis of mortar samples from the Church of the Saints Sergius and Bacchus at Umm as-Surab (Jordan)
09.45	Comparative analysis of the mechanical properties and workability of lime mortars: examples from Hungary and Cyprus	Black pigmentation by fungi in Romanic churches' wall paintings in Northern Portugal (15 th and 16 th century). Challenges and strategies of preventive conservation in places of worship	Microbiological diversity of ancient architectural structure of Wawel Royal Castle in Krakow, Poland
10.00	Evaluation of the fresh state properties of lime-based grouts through inter-laboratory comparative testing	Coatings in the conservation of Built Heritage with earth in Santiago de Chile	Characterization and durability analysis of coral stones in a marine environment
10.15	Investigating differences in the performance of lime-based mortars	Highly transparent TiO ₂ -SiO ₂ layers for cultural heritage preservation	Monitoring of bio-aerosols, gaseous and Particulate Matter (PM) pollution and microbiological contamination of stones and mortars of the reserve "The Lost Wawel" of Wawel Royal Castle in Cracow, Poland
10.30	Influence of the substrate on the mechanical characteristics of the applied mortars		Fernandina old Wall of Lisbon – Characterization towards its preservation
10.45	Impact of aggregates on fresh mortars' properties		

11.00-11.30 Coffee Break

11.30-12.30	Topic 4.2 (Auditorium) Chair: Ioannis Karatasios, Vassiliki Pachta	Topic 3.2 (Amphitheatre) Chair: Teresa Freire, Reyes Rodríguez	Topic 9.2 (Room 21) Chair: Mark Thacker, Farkas Pintér
11.30	Self-healing lime-based mortars using biological mechanisms and microvascular networks	Study of properties of gypsum plasters of Araripe's pole for application in restoration mortars	From lime to cement. Historic binders in Catalonia
11.45	Comparative evaluation of the morphological and rheological characteristics of nanolime dispersions for the consolidation of architectural monuments	Clay and gypsum mortars used during antiquity in Cyprus	When Portland cement meets natural cement
12.00	Photoactive Fe-TiO ₂ lime plasters for building protection	Physical- mechanical comparison of the traditional gypsums from Albarracín and Pallars	Methodology of identification of natural and historic Portland cements. Application and study in mortars of Madrid and Barcelona
12.15	Lime-based rendering mortars with photocatalytic and hydrophobic agents: assessment of the water repellency and biocide effect	Characterisation of gypsum renders in the Paris region and determination of the traditional fabrication process	

12.45-13.15 Closing session (Auditorium)

13.15-14.45 Buffet Lunch

15.00-22.00 Complimentary cultural activities

- 15.00** Bus to Olite (Departure from the outside of the Hall of the Auditorium)
- 15.30** Visit to the Castle of the Kings of Navarra and Church of Santa María (13th Century) in Olite
- 17.30** Bus to Otazu
- 18.00** Visit to Otazu Manor and Bodega Otazu winery. Cellar dinner
- 21.30** Bus to Pamplona

Tuesday, 18th June

17.30-19.30 **Registration** (Hall of Science Library building, next to the Auditorium)

Wednesday, 19th June

09.00-09.30 **Opening Session** (Auditorium)

09.30-11.00 **Inaugural Conference** (Auditorium)

Prof. Antonia Moropoulou

National Technical University of Athens, Greece

Historic mortars of the Holy Aedicule and the Tomb of Christ supporting the design and evaluation of performing and compatible restoration mortars and revealing the history of the monument (*A. Moropoulou et al.*)

11.00-11.30 **Coffee Break**

11.30-13.30 Topic 5.1 (Auditorium) Chair: Ioanna Papayianni & Sagrario Martínez-Ramírez

- 11.30** A map is worth a thousand pictures: The application of FTIR-mapping to the analysis of petrographic thin sections of historical and experimental mortar
Anthony J. Baragona; Marta Anghelone; Johannes Weber
University of Applied Arts, Vienna, Austria
- 11.45** Calcite or quartz powder as aggregate of Roman plasters (Lombardy, Italy)
Roberto Bugini; Luisa Folli
Istituto CNR Conservazione Beni Culturali, Milano, Italy
- 12.00** Characterisation methodology for lime based materials – A case study of the Rajagopuram of Pundarikaksha temple in Tamil Nadu, India
Divya Rani S.; Manu Santhanam
Indian Institute of Technology, Madras, India
- 12.15** Characterisation of concrete structures along the Reschen frontier, South Tyrol, Italy
Tobias Bader; Anja Diekamp
University of Innsbruck, Austria
- 12.30** Chemical, mineralogical and hydraulic characteristics of Roman mortars in Turkey
Burcu Taşçı; Hasan Böke
İzmir Institute of Technology, Turkey
- 12.45** Provenance study of raw materials used for lime making at Prague Castle during Medieval times
Petr Kozlovce; Jan Válek; Olga Skružná
Czech Academy of Sciences, Praha, Czech Republic

11.30-13.30 Topic 10 (Amphitheatre) Chair: John Hughes & Davide Gulotta

- 11.30** Evolution of mortars composition and characteristics during the 20th century – Study of Portuguese buildings awarded with Architecture Valmor Prize
Luís Almeida; António Santos Silva; José Mirão; Maria do Rosário Veiga
University of Évora; National Laboratory for Civil Engineering, Lisbon, Portugal
- 11.45** The restoration of the church of Our Lady of the Assumption, Daus, Bohol, Philippines
Jim Franklin O. Kalaw; Raul Y. Naguit Jr.
National Historical Commission of the Philippines, Manila, Philippines
- 12.00** The analysis of the proportion of mortar for Japanese roof tile (Ibushikawara) in Taiwan by applying of Taguchi Method
Bing-Sheng Yu; Mei-Tsu Hsu
National Taipei University of Technology, Taipei, Taiwan
- 12.15** The use of dolomitic lime in mortar samples from a 15th-century buttress of York Minster (York, UK)
Cecilia Pesce; Alick Leslie; Alison Henry; John David; Giovanni Pesce
Northumbria University; Historic England, Swindon; York Minster, York, U.K.
- 12.30** Digital image analysis as basic for the evaluation of mortars in architectural conservation
Christian Kaiser; Lea Oetinger; Ralf Kilian
Fraunhofer Institute for Building Physics IBP, Germany
- 12.45** Decorative renders simulating stone of middle 20th century in the region of Lisbon
Maria do Rosário Veiga; António Santos Silva; Cláudia Martinho; Paulina Faria
LNEC, CERIS, FCT, NOVA University of Lisbon, Lisbon, Portugal

13.30-15.00 Buffet Lunch

15.00-17.00 Topic 12.1 (Auditorium) Chair: Jan Válek & Enrico Sassoni

- 15.00** Characterization and compatibility assessment of commercial stone repair mortars
B. Lubelli; T.G. Nijland; R.P.J. van Hees
Delft University of Technology, TNO, Delft, The Netherlands
- 15.15** Improvements to water, salt-scaling and freeze-thaw resistances of historic mortar replication mixes
Michael P. Edison; Chad Lausberg
Edison Coatings, Inc., CT, U.S.A.
- 15.30** Use of ultrafine mafic rocks for the enhancement of carbonation reaction in lime renders
Loucas Kyriakou; Ioannis Rigopoulos; Ioannis Ioannou
University of Cyprus, Cyprus
- 15.45** The impact of elevated temperatures on the properties of lime-based mortars
Vasiliki Pachta; Sofia Triantafyllaki; Maria Stefanidou
Aristotle University of Thessaloniki, Thessaloniki, Greece
- 16.00** A grout and mortar system for fine cracks and shallow surface fills in Carrara marble
Andrew Thorn
Artcare, Melbourne, Australia
- 16.15** An innovative way for testing adhesion of non-structural injection grouts for the stabilisation of historic plasters
Chiara Pasian; Francesca Piqué; Albert Jornet
University of Malta, Malta, IMC, SUPSI, Lugano, Switzerland
- 16.30** NHL-based plasters and renders – Assessing the influence of mixing method on workability and hardened mortar properties
Frowin Ruegenberg; Martin Schidlowski; Tobias Bader; Anja Diekamp
Unit of Material Technology, University of Innsbruck, Austria
- 16.45** Comparing the moisture permeability of limecrete and concrete floor slabs
Grace A. Phillips; Kevin Briggs; Iain McCaig; Richard J. Ball
University of Bath, U.K.

15.00-17.00 Topic 1 (Amphitheatre) Chair: Paulina Faria & Noni-Pagona Maravelaki

- 15.00** Earth-based plasters – the effect of anhydrite stabilization
José Lima; Afonso Lino; Teresa Freire; Isabel Pombo; Paulina Faria
University of Lisbon, CERIS, FCT, NOVA University of Lisbon, LNEC, Lisbon, Portugal
- 15.15** Similar appearance of mortar and brick masses in Algiers Casbah houses during the Ottoman period (16th- early 18th centuries)
Semha Bernou; Tsouria Kassab; Rosa Bustamante; Francisco Fernández
Polytechnic School of Architecture and Urbanism (EPAU-Algiers), UPM, Madrid, Spain

- 15.30** Assessment of adhesive strength of an earth plaster on different substrates through different methods
Paulina Faria; José Lima; João Nabais; Vitor Silva
CERIS, FCT, NOVA University of Lisbon, Portugal
- 15.45** Earth-based plasters: the influence of clay mineralogy
José Lima Ferreira; Paulina Faria; António Santos Silva
University of Lisbon, CERIS, FCT, NOVA University of Lisbon, LNEC, Lisbon, Portugal
- 16.00** Earth-based and binder-based mortars comparison
José Lima; Paulina Faria; Rosario Veiga
University of Lisbon, CERIS, FCT, NOVA University of Lisbon, LNEC, Lisbon, Portugal
- 16.15** Earth-based and current plasters: assessment of efficiency and contribution to indoor air quality
Tânia Santos; Maria Idália Gomes; Flávia Coelho; Paulina Faria
CERIS, ISEL, Polytechnic Institute of Lisbon, FCT, NOVA University of Lisbon, Portugal
- 16.30** Earthen plasters based on illitic clayish earth – the influence of calcitic lime addition
José Lima; Paulina Faria; Rosario Veiga
University of Lisbon, CERIS, FCT, NOVA University of Lisbon, LNEC, Lisbon, Portugal
- 16.45** Rescuing the manufacturing process of traditional mortars present on XIX-century earthen buildings in Brazil
Andrea Cavicchioli; Isabela Ferreira Sodr  dos Santos; Jo o Guilherme Kimura Moreira; Lucy Gomes Sant'Anna
University of S o Paulo, Brazil

17.00-17.30 Coffee Break

17.30-18.30 Topic 11.1 (Room 21) Chair: Chiara Pasian & Sara Pav a

- 17.30** Comparative analysis of permeability values of traditional aerial lime mortars for preventive conservation
Ana Gonz lez-Serrano; Reyes Rodr guez-Garc a; Esther Ontiveros-Ortega
University of Seville, Andalusian Historical Heritage Institute, IAPH, Seville, Spain
- 17.45** Comparative study of ethyl silicate versus acrylic resin consolidation of wall painting with high water and salts contents: a case study at the Chapter Hall of Chartres cathedral
Laura Normand; St phanie Duch ne; V ronique Verg s-Belmin; Claire Dandrel; David Giovannacci; Witold Nowik
LRMH, Minist re de la Culture et de la Communication, Sorbonne Universit s, CRC, USR 3224, Mus um national d'Histoire naturelle, Paris, Conservator-restorer of wall painting, Fontenay-aux-Roses, France
- 18.00** Preliminary results on the use of ammonium phosphate solutions for the consolidation of lime-based mortars
Enrico Sassoni; Cesare Pizzigatti; Elisa Franzoni
DICAM, University of Bologna, Italy

17.30-18.30 Topic 8 (Amphitheatre) Chair: Caspar Groot & António Santos

- 17.30** Structural characterization and thermal decomposition of lime binders allow accurate radiocarbon age determinations

Michael B. Toffolo; Lior Regev; Eugenia Mintz; Ifat Kaplan-Ashiri; Stéphan Dubernet; Elisabetta Boaretto

IRAMAT-CRP2A, UMR 5060 CNRS, Université Bordeaux Montaigne, France, Weizmann Institute of Science, Israel

- 17.45** An Ecology of Castle Construction: geoarchaeology, archaeobotany & radiocarbon analysis in the ecotone of Lochindorb Castle

Mark Thacker

Stirling University, Scotland, U.K.

- 18.00** The latest advances on Single grain OSL dating of mortars and their integration in early medieval archaeology

Petra Urbanová

University of Padua, Italy, IRAMAT-CRPAA, University Bordeaux Montaigne, France

- 18.15** Characterization and Radiocarbon dating of complex mortars in Historic Buildings

Giulia Ricci; Gilberto Artioli; Michele Secco; Anna Addis; Fabio Marzaioli; Filippo Terrasi; Isabella Passariello

CIRCe, University of Padova, University of Campania "Luigi Vanvitelli", Italy

19.30-20.30 Visit to the restoration of the Cloister of the Cathedral of Pamplona
Meeting point: atrium of the Cathedral



Thursday, 20th June

09.00-11.00 Topic 12.2 (Auditorium) Chair: Paulina Faria & Véronique Vergès-Belmin

- 09.00** Impact of guar gum and chitosan ethers on physico-mechanical properties and durability of natural hydraulic lime mortars
Tomáš Žížlavský; Martin Vyšvařil; Patrik Bayer; Pavla Rovnaníková
Brno University of Technology, Brno, Czech Republic
- 09.15** Lime-based grouts for architectural surface repair. Comparison of their performance by using laboratory and field test methods
Vasiliki Pachta; Ioanna Papayianni; Thomas Spyriiotis
Aristotle University of Thessaloniki, Thessaloniki, Greece
- 09.30** Limestone-filled, hydraulic-lime mortars for historic and traditional fabrics
M. Aly; S. Pavía
Trinity College Dublin, Ireland
- 09.45** Lime based mortars. Relationships between composition parameters and mechanical strength
Ioanna Papayianni; Dimitris Papadimitriou
Aristotle University of Thessaloniki, Thessaloniki, Greece
- 10.00** Lime-pozzolan injection grouts with ovalbumin and ethanol added as water-reducing agents: grout design and assessment of the mineralogical evolution
Chiara Pasian; Michele Secco; Francesca Piqué; Gilberto Artioli; Sharon Cather
University of Malta, ICEA, CIRCe, University of Padua, Italy, IMC, SUPSI, Lugano, Switzerland, Professor Emerita, London, U.K.
- 10.15** Microstructure of lime pastes with the addition of vegetable oils
Cristiana Nunes; Alberto Viani; Kateřina Mlsnová; Dita Frankeová; Petra Mácová
Czech Academy of Sciences, Czech Republic
- 10.30** Effects of natural zeolite addition to lime based render layers for restoration of historical buildings
Marina Askrabic; Dimitrije Zakić; Aleksandar Savić; Ljiljana Miličić
University of Belgrade, IMS Institue, Serbia
- 10.45** Formulated lime mortars as a sustainable practice for Built Heritage conservation in Mexico
Marlene Sámano Chong
National Institute of Anthropology and History, Mexico

09.00-11.00 Topic 5.2 (Amphitheatre) Chair: Rosário Veiga & Johannes Weber

- 09.00** Roman vs. medieval crushed brick lime mortars: A comparative study
Martin Schidlowski; Tobias Bader; Anja Diekamp
University of Innsbruck, Austria
- 09.15** Analytical and chromatic characterization of the interior walls finishes in the Batlló House of Gaudí in Barcelona. A surprising discovery
Àgueda Serra; Joan Casadevall
Gabinet del Color S.L., Barcelona, Spain
- 09.30** Mineralogical characterization of historical cement-based mortar from Rupnik military fortification line
Petra Štukovnik; Janez Peter Grom; Marjan Marinšek; Violeta Bokan Bosiljkov
University of Ljubljana, Slovenia
- 09.45** Algarve vernacular architecture facade ornaments: chemical, physical and mechanical characterization
Marta Santos; António Santos Silva; Rosário Veiga
University of Lisbon, National Laboratory for Civil Engineering (LNEC), Lisbon, Portugal
- 10.00** Medieval mortar, stone and repair mortar of an abandoned Medieval Church, compatibility issues: example from Hungary
Zsuzsanna Kósa; Ákos Török
Budapest University of Technology and Economics, Hungary
- 10.15** Interpretation of scientific data derived from analytical techniques used in the characterisation of Roman mortars
Duygu Ergenç; Rafael Fort; Nevin Aly; Olivier Henry; Sayed Hemed
Institute of Geosciences (CSIC-UCM), Spain; Suez University, Egypt; Ecole Normale Supérieure, AOROC, France; Cairo University, Egypt

09.00-11.00 Topic 6 (Room 21) Chair: Albert Jornet & Mar Barbero

- 09.00** Blast furnace slag in historic mortars from Bergslagen, Sweden
Jan Erik Lindqvist; Kristin Balksten, Birgit Fredrich
RISE CBI, Uppsala University, Sweden
- 09.15** A Mortar Maker's guide to evolving mortar specifications in 18th and 19thC France and England and their implications today
Lucie Fusade
University of Oxford, U.K.
- 09.30** Preliminary research on potential raw material sources for dolomitic lime mortars at St John convent at Müstair, Switzerland
Giovanni Cavallo; Marta Caroselli; Albert Jornet; Patrick Cassitti
SUPSI, Lugano, Stiftung Pro Kloster St.-Johann, Switzerland

- 09.45** Pozzolanicity beyond Vitruvius: insights into the exploitation of reactive silicates throughout the Roman world

Michele Secco; Giulia Ricci; Simone Dilaria; Enrico Garbin; Gilberto Artioli; Yotam Asscher; Sergio Tamburini; Caterina Previato; Jacopo Bonetto

ICEA, CIRCe, DBC, University of Padova, Israel Antiquities Authority (IAA), CNR-ICMATE

- 10.00** Composition and technology of the 17th century stucco decorations at Červená Lhota Castle in the southern Bohemia

Jan Válek; Olga Skružná; Petr Kozlovcev; Dita Frankeová; Petra Mácová; Alberto Viani; Ivana Kumpová

The Czech Academy of Sciences, Czech Republic

- 10.15** Hot applied lime mortar – assessment of a traditional technique used in modern restoration

T. Köberle; M. Zötzl; A. Fenzke; H. Siedel

TU Dresden, Institut für Diagnostik und Konservierung an Denkmälern in Sachsen und Sachsen Anhalt e.V., Halle, Freelance mason and restorer, Bad Marienberg, Germany

11.00-11.30 Coffee Break

11.30-13.30 Topic 2 (Auditorium) Chair: Maria Stefanidou & Maria Amenta

- 11.30** Enhancing clay mortars' properties

Aspasia Karozou; Maria Stefanidou

Aristotle University of Thessaloniki, Greece

- 11.45** Active photocatalytic-superhydrophobic coating with TiO₂-ZnO nano-heterostructures for lime mortars

Alessandro Speziale; Jesús Fidel González-Sánchez; Íñigo Navarro-Blasco; José M. Fernández; José I. Álvarez

University of Navarra, Pamplona, Spain

- 12.00** Evaluation of SiO₂ nanoparticles as additive for lime mortars: changes in the microstructure and mechanical properties

María del Mar Barbero-Barrera; Aranzazu Sierra Fernández; Duygu Ergenç; Luz Stella Gómez Villalba; Rafael Fort

UPM, IGEO (CSIC-UCM), Madrid, Spain

- 12.15** Evaluation of the influence of nano-SiO₂ and nano-Al₂O₃ in physico-mechanical properties and microstructure of calcareous clay

Eirini-Chrysanthi Tsardaka; Maria Stefanidou

Aristotle University of Thessaloniki, Greece

- 12.30** Studies of the mechanical properties of lime mortars treated with alkaline earth hydroxide nanoparticles
Penka I. Girginova; Cristina Galacho; Maria do Rosário Veiga; António Santos Silva; António Candeias
HERCULES, University of Évora, LNEC, Lisbon, Portugal
- 12.45** Synthesis of nanolime in sugary solutions
Sagrario Martínez-Ramírez; Laura R. Higuera; Ignacio Cascales; Moisés Martín-Garrido; Maximina Romero
Instituto de Estructura de la Materia, Madrid, Spain
- 13.00** The use of nanoparticles to improve the performance of restoration mortars
Beatriz Menéndez; Dita Frankeová; José Diaz; Radek Ševčík; Petra Mácová; Mouna Faiz; Zuzana Slížková
Université de Cergy-Pontoise, France, Academy of Sciences, Prague, Czech Republic
- 13.15** Study of the role of different nanoparticles in lime pastes
Eirini-Chrysanthi Tsardaka; Maria Stefanidou
Aristotle University of Thessaloniki, Greece

11.30-13.30**Topic 3.1 (Amphitheatre) Chair: Teresa Freire & David Sanz**

- 11.30** Stucco marble in the Portuguese architecture: first insights in mineralogical, physical and mechanical properties
Maria Teresa Freire; António Santos Silva; Maria do Rosário Veiga
National Laboratory for Civil Engineering, LNEC, Lisbon, Portugal
- 11.45** Detailed studies of gypsum renders and plasters from the Ishrat Khane Mausoleum in Samarkand, Uzbekistan
Steffen Laue
University of Applied Sciences Potsdam, Potsdam, Germany
- 12.00** Historic gypsum mortars from Emilia Romagna (Italy). Mineralogical and petrographic analysis
David Sanz-Arauz; Fabio Fratini; Emma Cantisani; Gian Carlo Grillini
UPM, Madrid, Spain, ICVBC-CNR, Italy, Università di Bologna, Italy
- 12.15** The use of stucco-marble to restore veined polished limestone. The case of the pavement in the major sacristy of the Cathedral of Seville
Antonio González Portillo; Maria Teresa Freire
Artyco, Madrid, Spain, National Laboratory for Civil Engineering, LNEC, Lisbon, Portugal
- 12.30** Thermal monitoring of a traditional gypsum oven in Ribera d'Ondara (Lleida) and simulation of the calcination process
Antonia Navarro Ezquerra; Belén González Sánchez; Manuel Julià i Macias; Ana Maria Lacasta Palacio; Marc Tous Coll; Bryan Rivas Guevara; Felipe Buill Pozuelo; Judith Ramírez Casas
EPSEB-Universitat Politècnica de Catalunya, Barcelona, Spain

11.30-13.30**Topic 7.1 (Room 21) Chair: Vassiliki Pachta & Kristin Balksten**

- 11.30** Technical analysis on materials and characteristics of mortar-based compounds in Roman and Late antique Aquileia (Udine, Italy). A preliminary report of the results

Simone Dilaria; Michele Secco; Jacopo Bonetto; Gilberto Artioli

University of Padova, ICEA-CIRCe, Padova, Italy

- 11.45** M.N.I.A.R. techniques of macroscopic characterization from the colorimetry and chromatographies analysis applied to the mortars in the archaeological site of Los Hitos (Arisgotas, Toledo, Spain)

Pablo Guerra García; Jorge Morín de Pablos; Isabel Sánchez Ramos

UPM, AUDEMA SA, Madrid, Spain, University College of London, U.K.

- 12.00** Insights into Carolingian construction techniques – results from archaeological and mineralogical studies at Müstair Monastery, Grisons, Switzerland

Marta Caroselli; Christine Bläuer; Patrick Cassitti; Giovanni Cavallo; Irka Hajdas; Sophie Hüglin; Hans Neukom; Albert Jornet

SUPSI, Canobbio, Conservation Science Consulting Sàrl, Fribourg, Foundation Pro Monastery of St. John, Müstair, Laboratory of Ion Beam Physics, Eidgenössische Technische Hochschule, Zürich, Switzerland

- 12.15** Animal, vegetable or mineral? Characterising shell-lime, maerl-lime and limestone-lime mortar evidence from the Late Norse and Medieval site of Tuquoy, Orkney

Mark Thacker; John Hughes; Nic Odling

Stirling University, University of the West of Scotland, Edinburgh University, U.K.

- 12.30** Analysis of mortars from the Tarragona Roman Aqueduct as a study case to document original building and restoration materials

N. Guasch-Ferré; J.L. Prada; M.A. Iglesias-Campos; M. Badia; À. Pitarch Martí; Ll. Casas; J. Menchon

UB, ESCRBCC, UAB, Catalonia, Spain, UMR 5199 PACEA CNRS/Université Bordeaux, Pessac, France, Tarragona City Council, Tarragona, Catalonia, Spain

- 12.45** Characterisation of Roman mortar from the archaeological site of Mirobriga

Alvin Sern Hao Chua; Paula Cristina Gonçalves Pereira Galacho; Patrícia Sofia Martins Moita; José Carlos Quesada

Laboratório HERCULES/Universidade de Évora, Universidade Nova de Lisboa, Portugal

13.30-15.00 Buffet Lunch

15.00-16.30**Topic 9.1 (Auditorium) Chair: Michele Secco & Giulia Ricci**

- 15.00** European natural cements - their key technical properties under standardised conditions
David Hughes; Johannes Weber; Vincenzo Starinieri; Farkas Pintér; Christophe Gosselin; Steven Feldman; Cecilia Pesce
University of Applied Arts, Vienna, Austria, Sheffield Hallam University, U.K., Federal Monuments Authority, Vienna, Austria, University of Bradford, U.K., Geotest SA, Le Mont sur Lausanne, Switzerland, National Institute of Standards and Technology, U.S.A.
- 15.15** From marlstone to rotary kilns – the early development of Portland cement
Farkas Pintér; Christophe Gosselin; Thomas Köberle; István Vidovszky; Johannes Weber
Federal Monuments Authority Austria, Vienna, Austria, Geotest SA, Le Mont sur Lausanne, Switzerland, Technische Universität Dresden, Germany, Budapest University of Technology and Economics, Hungary, University of Applied Arts Vienna, Austria
- 15.30** Drying shrinkage of historic Portland cements: factors to be considered for successful repair
Simeon Wilkie; Thomas Dyer
Getty Conservation Institute, U.S.A., University of Dundee, U.K.
- 15.45** Restoration techniques using 1930's Portland cements at Porte de l'Est in the Roman city-wall of Aventicum, Switzerland
Christophe Gosselin; Noé Terrapon
Geotest SA, Le Mont sur Lausanne, Switzerland; Laboratoire de conservation-restauration, Avenches, Switzerland
- 16.00** Repairs to historic concrete pavement at Jacob Riis Park utilizing Natural, Roman and Portland cements
Michael P. Edison
Society for the Preservation of Historic Cements, Inc., U.S.A.
- 16.15** The use of mortars in Palau Güell by Antoni Gaudí
Ricardo Gómez-Val; Judith Ramírez-Casas; Antonia Navarro Ezquerro
Universitat Politècnica de Catalunya, Barcelona, Spain

15.00-16.30**Topic 4.1 (Amphitheatre) Chair: Ioannis Karatasios & Íñigo Navarro-Blasco**

- 15.00** Hydrophobized lime grouts prepared with microsilica and superplasticizers
Jesús Fidel González-Sánchez; Íñigo Navarro-Blasco; José M. Fernández; Adrián Durán; Rafael Sirera; José I. Álvarez
University of Navarra, Pamplona, Spain
- 15.15** Self-cleaning of previously healed historic mortars with multi-functional coatings
Jonjaua Ranogajec; Maria Malesevic-Cuculis; Helena Hirszenberger; John Milan van der Bergh; Snezana Vucetic
University of Novi Sad, Technical high school "Mileva Maric-Ajnstajn", Novi Sad, Serbia

- 15.30** Use of natural zeolite aggregate in restoration lime renders
Martin Vyšvařil; Patrik Bayer; Tomáš Žížlavský; Pavla Rovnaníková
Brno University of Technology, Brno, Czech Republic
- 15.45** Addressing safety and durability requirements of architectural heritage by developing functional conservation mortars
Ioannis Karatasios, Zoi S. Metaxa; Stavros K. Kourkoulis; Nikolaos D. Alexopoulos; Vassilis Kilikoglou
N.C.S.R. "Demokritos", National Technical University of Athens, University of the Aegean, Chios, Greece
- 16.00** Autogenic vs. autonomic self-healing process in conservation mortars with crystalline admixture
Maria Amenta; Matina Papaioannou; Marios S. Katsiotis; Dimitris Gournis; Vassilis Kilikoglou; Ioannis Karatasios
N.C.S.R. Demokritos, TITAN Cement Company S.A., University of Ioannina, Greece
- 16.15** SRG composite systems for strengthening masonry structures: from laboratory to field applications
Paolo Casadei; Paolo Girardello
Strengthening Division, Kerakoll Spa, Sassuolo (MO), Italy

15.00-16.30**Topic 5.3 (Room 21) Chair: Roberto Bugini & Giovanni Cavallo**

- 15.00** Petrography of Historic mortar materials: Polarising light microscopy as a method for characterising lime-based mortars
Kristin Balksten; Jan-Erik Lindqvist; Bo Nitz; John J. Hughes
Campus Gotland–Uppsala University, Sweden RISE Research Institutes of Sweden, Visby, University of the West of Scotland, U.K.
- 15.15** Colors and grains: study on the composition and characteristics of mortars of the 18th and 19th centuries in São Luís, Maranhão – Brazil
Raquel Galvão; Rui Póvoas; Rosário Veiga; António Santos Silva
Universidade do Porto, CEAU, Porto, LNEC, Lisbon, Portugal
- 15.30** DB-Heritage: A database of mortars composition and characteristics
António Santos Silva; Rodrigo Giollo; Maria João Correia; Maria do Rosário Veiga; Paulina Faria
LNEC, CERIS, FCT, NOVA University of Lisbon, Lisbon, Portugal
- 15.45** Characterization of lime mortar from a Tabique Pampango Wall Technique in the Philippines
Jan-Michael C. Cayme
De La Salle University, Manila, Philippines

16.30-16.45	Gordillo's Cal de Morón presentation (Amphitheatre) ARTISAN LIME. From tradition to innovation. Back to origin
--------------------	---

16.45-17.00	Technical Presentation by SINT Technology (Room 21) Drilling Resistance Measurement System, DRMS
--------------------	---

17.00-17.30 Coffee Break

17.30-18.00	Workshop by Gordillo's Cal de Morón (Room 14) Practical applications of putty lime: design of mortars
--------------------	--

18.00-18.45	POSTERS (Hall of the Amphitheatre)
--------------------	---

- T 1** Macroscopic high resolution techniques to the characterization of the mortars structures in the Sé-Cathedral's archaeological complex in Idanha-a-Velha (Portugal)
Pablo Guerra García; Jorge Morín de Pablos; Isabel Sánchez Ramos
UPM, AUDEMA SA, Madrid, Spain, University College of London, U.K.
- T 3** Figural Renaissance stucco in the Czech Republic – Technological and material characterisation
R. Tišlová; L. Bartůňková; T. Köberle; Z. Kovařík; V. Krajiček; D. Všianský; P. Majoroš
University of Pardubice, Litomyšl, Masaryk University, Brno, Technische Universität Dresden, Dresden, Czech Republic
- T 4** Fibre reinforced mortars for cultural heritage protection
Miloš Drdácý; Dagmar Michoinová
Czech Academy of Sciences, The National Heritage Institute, Prague, Czech Republic
- T 5** Roman mortars of floor substrates and walls from Arroyo de la Dehesa de Velasco site: petrographic and mineralogical characterization
Ainhoa Alonso-Olazabal, Luis Ángel Ortega; M^a Cruz Zuluaga; Graciela Ponce-Antón; Javier Jiménez Echevarría; Carmen Alonso Fernández
University of the Basque Country (UPV/EHU), Bizkaia, CRONOS SC, Burgos, Spain
- T 5** Hydraulic mortars at Caesarea: underwater and on-land pozzolanic reactions through chemical and mineralogical examinations of Herodian, Roman, and Byzantine constructions
Yotam Asscher; Aliza Van Zuiden; Chen Elimelech; Michele Secco; Giulia Ricci; Gilberto Artioli
Israel Antiquities Authority (IAA), Israel, University of Padova, ICEA, CIRCe, Italy
- T 5** Characterization of historical mortars from the Portuguese Citadel in Ksar Seghir (Morocco)
Cristina Galacho; Patrícia Moita; André Teixeira; Antónia Tinturé; Joana Bento Torres; Abdelatif El-Boudjay; António Candeias
HERCULES, University of Évora, Universidade Nova de Lisboa, Portugal, Direction Générale du Patrimoine, Morocco

- T 5** 16th century decorative elements in the Convento dos Capuchos (Serra de Sintra, Portugal)
Patricia Moita; Cristina Galacho; Fátiam Llera; Carlos Marques, José Mirão; António Candeias
HERCULES, University of Évora, In Situ-conservação De Bens Culturais Lda, Parques de Sintra – Monte da Lua, Portugal
- T 6** Warm applied Mortar (WAM) – A research into the historical technique of “Heiße Speis” and its use for plasters
Robert Wacha ; Farkas Pintér
Cultural Heritage Preservation, Federal Monuments Authority, Austria
- T 6** Mortars and renders from Roman villa Horta da Torre (Portugal): a multi-analytical approach
A.Ditta; Patricia Moita; Cristina Galacho; A. Carneiro; José Mirão; António Candeias
University of Évora, Portugal
- T 7** Characterization of historical mortars from the Botanic Garden of the National Palace of Queluz
Cristina Galacho; Patrícia Moita; José Mirão; António Candeias; Carlos Marques
HERCULES Laboratory, University of Évora, Parque de Sintra – Monte da Lua, Portugal
- T 7** Petrographic and chemical-mineralogical characterization of plaster and mortar from the Renaissance cistern at Amaiur Castle (Navarre, Spain)
Graciela Ponce-Antón; Maria Cruz Zuluaga; Luis Angel Ortega
University of the Basque Country (UPV/EHU), Bizkaia, Spain
- T 8** Characterization of historic mortars: techniques used to establish a construction chronology. Case study: “Aragoneses mill” as it belongs to popular architectural heritage
Esther Moreno Fernández; Javier Pinilla Melo; Francisco González Yunta; Alberto Sepulcre Aguilar; Ignacio Lombillo Vozmediano; Yosbel Boffill Orama
ETSAM, ETSE, Universidad Politécnica de Madrid, University of Cantabria, Spain
- T 10** Towards an integrated approach to mortar analysis – The Pompei Arch&Lab Project
Ralf Kilian; Christian Kaiser; Lea Oetinger; Edit Aichinger; Katrin Wilhelm
Fraunhofer Institute for Building Physics IBP, Germany, Oxford University, U.K.
- T 10** Practical application of lime-pozzolan mortars to damp masonry
Frankeová Dita; Janotová Dana; Slížková Zuzana
Academy of Sciences of the Czech Republic, Prague, Czech Republic
- T 11** Calcium alkoxide as an innovative product to consolidate cracks in cement mortars
Martina Zuena; Enrico Garbin; Gilberto Artioli; Matteo Panizza; Luca Nodari; Andrijana Sever Škapin; Luka Skrlep; Andreja Pondelak; Patrizia Tomasin
CNR, CIRCe, University of Padova, Padova, Italy, Slovenian National Building and Civil Engineering Institute, Ljubljana, Slovenia

18.00-18.45

Topic 12.3 (Auditorium) Chair: Cristiana Nunes & Ana Velosa

18.00 Efficiency of field test methods for evaluation of non-structural injection grouts in Slovenian conservation practice

Andreja Padovnik; Violeta Bokan-Bosiljkov

University of Ljubljana, Slovenia

18.15 Evaluation of the rheological behaviour of a natural additive of vegetal origin in restoration lime mortars as an ecological and sustainable alternative

N. Guasch-Ferré; M.R. Veiga; T. Díaz Gonçalves; M.T. Doménech-Carbó; J.L. Prada; X. Mas i Barberà; M.P. de Luxán Gómez del Campillo

ESCRBCC, Barcelona, Catalonia, LNEC, Lisbon, Portugal, IRP-UPV, València, IETcc-CSIC, Madrid, Spain

18.30 Diethyl oxalate-based microgrouts in calcium carbonate systems: formulation, field testing and mineralogical characterisation

J. Porter; C. Pasian; M. Secco; M. Salameh; N. Debono

University of Malta, Malta, ICEA, CIRCe, University of Padua, Italy

20.00-23.00

Guided visit to the Museum University of Navarra (MUN). Gala dinner

Meeting point: Esplanade at the entrance of the Museum



Friday, 21st June**09.30-11.00 Topic 12.4 (Auditorium) Chair: Cristina Galacho & Esther Ontiveros**

- 09.30** The initial reactions of lime-pozzolan pastes for conservation of masonry
Tugce Busra Su; Richard J Ball; Juliana Calabria Holley
University of Bath, U.K.
- 09.45** Comparative analysis of the mechanical properties and workability of lime mortars: examples from Hungary and Cyprus
Ákos Török; Zsuzsanna Kósa; Zita Pápay; Ioannis Ioannou; Ioannis Rigopoulos
Budapest University of Technology and Economics, Budapest, Hungary, University of Cyprus, Nicosia, Cyprus
- 10.00** Evaluation of the fresh state properties of lime-based grouts through inter-laboratory comparative testing
Vasiliki Pachta; Davide Gulotta; Jan Válek; Ioanna Papayianni
Aristotle University of Thessaloniki, Greece, The Getty Conservation Institute, U.S.A., The Czech Academy of Sciences, Czech Republic
- 10.15** Investigating differences in the performance of lime-based mortars
Ioanna Papayianni; Vasiliki Pachta; Emmanouela Berberidou; Maria Kalogirou
Aristotle University of Thessaloniki, Thessaloniki, Greece
- 10.30** Influence of the substrate on the mechanical characteristics of the applied mortars
Isabel Torres; Dora Silveira; Inês Flores Colen; Rafael Travincas; Gina Matias
University of Coimbra / ADAI / LAETA, Association for the Development of Industrial Aerodynamics / ITeCons, CERIS, DECivil, IST, University of Lisbon, Portugal
- 10.45** Impact of aggregates on fresh mortars' properties
Ana Rita Santos; Maria do Rosário Veiga; António Santos Silva; Jorge de Brito
LNEC, Universidade de Lisboa, Lisbon, Portugal

09.30-11.00 Topic 11.2 (Amphitheatre) Chair: Violeta Bokan-Bosiljkov & Ana González-Serrano

- 09.30** Frost resistance of reproduced mosaic mortars
Pavla Bauerová; Pavel Reiterman; Eva Vejmelková; Martin Keppert
Czech Technical University in Prague, Czech Republic
- 09.45** Challenges and strategies of preventive conservation in places of worship – Church of Nossa Senhora de Guadalupe case study
Alexandra Marco; Patrícia R. Moreira; Manuela Pintado; Eduarda Vieira
School of Arts, CITAR, CBQF, Portuguese Catholic University, Oporto, Portugal
- 10.00** Coatings in the conservation of Built Heritage with earth in Santiago de Chile
Patrícia Marchante; Pilar Silva; Ana Velosa; Sara Moutinho
Tierractual, Chile, Universidade de Aveiro, Portugal

10.15 Highly transparent TiO₂-SiO₂ layers for cultural heritage preservation

Sylvia Svorová Pawelkovicz; Petr Svora; Zdeněk Prošek; Michaela Jakubičková; Jan Šubrt

Czech Academy of Sciences, Technical University in Prague, Technical University of Liberec, Czech Republic

09.30-11.00 Topic 7.2 (Room 21) Chair: Caspar Groot & Duygu Ergenç**09.30**

Analysis of Mortar Samples from the Church of the Saints Sergius and Bacchus at Umm as-Surab (Jordan)

Piero Gilento; Cecilia Pesce; Giovanni Pesce

University Paris 1 Panthéon-Sorbonne, Paris, France, Northumbria University, Newcastle upon Tyne, U.K.

09.45 Microbiological diversity of ancient architectural structure of Wawel Royal Castle in Krakow, Poland

Magdalena Dyda; Adam Pyzik; Ewa Wilkojc; Beata Kwiatkowska-Kopka; Aleksandra Skłodowska

Research and Development for Life Sciences Ltd., University of Warsaw, Warsaw, Wawel Royal Castle, Krakow, Poland

10.00 Characterization and durability analysis of coral stones in a marine environment

Swathy Manohar; Manu Santhanam

Indian Institute of Technology Madras, India

10.15 Monitoring of bio-aerosols, gaseous and Particulate Matter (PM) pollution and microbiological contamination of stones and mortars of the reserve "The Lost Wawel" of Wawel Royal Castle in Cracow, Poland

Magdalena Dyda; Ewa Wilkojc; Beata Kwiatkowska-Kopka; Oliwia Buchwald-Zieczina; Karolina Szlek; Sławomir Korzeniowski; Paulina Drabik; Aleksandra Skłodowska

Research and Development for Life Sciences Ltd., University of Warsaw, Warsaw, Wawel Royal Castle, Krakow, Poland

10.30 Fernandina old Wall of Lisbon – Characterization towards its preservation

Leandro Gomes; Paulina Faria; Vitor Silva; António Santos Silva

FCT, CERIS, NOVA University of Lisbon, LNEC, Lisbon, Portugal

11.00-11.30 Coffee Break

11.30-12.30 Topic 4.2 (Auditorium) Chair: Ioannis Karatasios & Vassiliki Pachta

- 11.30** Self-healing lime-based mortars using biological mechanisms and microvascular networks
Cristina De Nardi; Magdalini Theodoridou; Philip Sim; Michael Harbottle; Anthony D. Jefferson
School of Engineering, Cardiff University, Wales, U.K.
- 11.45** Comparative evaluation of the morphological and rheological characteristics of nanolime dispersions for the consolidation of architectural monuments
Anastasia Michalopoulou; Elisavet Michailidi; Evangelos Favvas; Noni-Pagona Maravelaki; Vassilis Kilikoglou; Ioannis Karatasios
N.C.S.R. "Demokritos", Athens, Technical University of Crete, Akrotiri, Chania, Greece
- 12.00** Photoactive Fe-TiO₂ lime plasters for building protection
Chrysi Kapridaki; Nikolaos Xynidis; Nikolaos Xekoukoulotakis; Nikolaos Kallithrakas-Kontos; Noni Maravelaki
Technical University of Crete, Chania, Crete, Greece
- 12.15** Lime-based rendering mortars with photocatalytic and hydrophobic agents: assessment of the water repellency and biocide effect
Jesús Fidel González-Sánchez; Burcu Taşçı; Guillermo Martínez de Tejada; José M. Fernández; Íñigo Navarro-Blasco; José I. Alvarez
University of Navarra, Pamplona, Spain

11.30-12.30 Topic 3.2 (Amphitheatre) Chair: Teresa Freire & Reyes Rodríguez

- 11.30** Study of properties of gypsum plasters of Araripe's pole for application in restoration mortars
Fernanda Cavalcanti Ferreira; Jose Getulio Gomes de Sousa; Arnaldo Manoel Pereira Carneiro
Universidade Federal de Pernambuco, Universidade Federal do Vale do São Francisco, Brazil
- 11.45** Clay and gypsum mortars used during antiquity in Cyprus
Maria Philokyprou
University of Cyprus, Cyprus
- 12.00** Physical- mechanical comparison of the traditional gypsums from Albarracín and Pallars
David Osmar Batres Hernández; Antonia Navarro Ezquerra; Joan Ramón Rosell Amigó
EPSEB - UPC Universitat Politècnica de Catalunya, Barcelona, Spain
- 12.15** Characterisation of gypsum renders in the Paris region and determination of the traditional fabrication process
Jean Ducasse-Lapeyrousse; Véronique Vergès-Belmin
Cercle des Partenaires du Patrimoine, Laboratoire de Recherche des Monuments Historique, France

11.30-12.30 Topic 9.2 (Room 21) Chair: Mark Thacker & Farkas Pintér

- 11.30** From lime to cement. Historic binders in Catalonia
Judith Ramírez-Casas; Joan Ramon Rosell Amigó; Jaume Rosell Colomina
EPSEB - UPC Universitat Politècnica de Catalunya, Barcelona, Spain
- 11.45** When Portland cement meets natural cement
Elisabeth Marie-Victoire; Myriam Bouichou
LRMH, CRC, CNRS, Ministère de la Culture, France
- 12.00** Methodology of identification of natural and historic Portland cements. Application and study in mortars of Madrid and Barcelona
Cristina Mayo Corrochano; Judith Ramírez Casas; David Sanz Arauz; Antonia Navarro Ezquerro; Juan Ramón Rosell Amigó
ETSAM-UPM, Madrid; UPC, Barcelona, Spain

12.45-13.15 Closing Session (Auditorium)**13.15-14.45 Buffet Lunch****15.00-22.00 Complimentary cultural activities**

- 15.00** Bus to Olite (Departure from the outside of the Hall of the Auditorium)
- 15.30** Visit to the Castle of the Kings of Navarra and Church of Santa María (13th century) in Olite
- 17.30** Bus to Otazu
- 18.00** Visit to Otazu Manor and Bodega Otazu winery. Cellar dinner
- 21.30** Bus to Pamplona



Pictures from the Museum “Cal de Morón”

Throughout the HMC 2019 the photographic exhibition "In quicklime" which presents several canvases and boxes with photographs and thematic related to the work in the artisanal production of lime in the lime kilns of Morón de la Frontera and further extinction of lime following the traditional techniques was displayed.

Visits of interest

Every day, once the sessions of the Conference were finished, there has been a social program according to the following schedule:

Wednesday, 19th

Guided tour of the cloister of the Cathedral of Pamplona, commented by the architect in charge of the ongoing restoration works.

Thursday, 20th

- Guided visit to the Museum University of Navarra. This building, designed by Pritzker-awarded Rafael Moneo is famous by the legacies of Contemporary art collection donated by M.J. Huarte, as well as by the collection of costumbrist photography by Ortiz de Echagüe.
- Gala dinner in the Museum.

Friday, 21st

- Guided tour to the Medieval Castle of the Kings of Navarra and to their adjacent church of Santa María (XIII century) in Olite.
- Visit to the Otazu Manor: armoury palace, the Romanesque chapel of San Esteban, museum of contemporary art and the winery Bodega Otazu, including the spectacular barrel hall. Cocktail dinner therein.



5th Historic Mortars Conference

HMC 2019

Delegates

University of Navarra, Pamplona

19th – 21st June, 2019

Algeria

BERNOU, SEMHA

Polytechnic School of Architecture and Town Planning of Algiers-EPAU
semha.bernou@gmail.com

Australia

THORN, ANDREW

Conservator at Artcare. Melbourne
Andrew.Thorn@artcare.cc

YOUNG, DAVID

Conservation Consultant. Victoria
david.young@netspeed.com.au

Austria

BADER, TOBIAS

Unit of Material Technology, University of Innsbruck
Tobias.Bader@uibk.ac.at

BARAGONA, ANTHONY

Institute for Art and Technology, Conservation Science,
University of Applied Arts. Vienna
tonybaragona@gmail.com

DIEKAMP, ANJA

Unit of Material Technology, University of Innsbruck
Anja.Diekamp@uibk.ac.at

PINTÉR, FARKAS

Scientific Laboratory, Federal Monuments Authority
Austria. Vienna
farkas.pinter@bda.gv.at

RUEGENBERG, FROWIN

Unit of Material Technology, University of Innsbruck
frowin.ruegenberg@uibk.ac.at

SCHIDLOWSKI, MARTIN

Unit of Material Technology, University of Innsbruck
m.schidlowski@live.de

WEBER, JOHANNES

Institute for Art and Technology/Conservation Science,
University of Applied Arts. Vienna
johannes.weber@uni-ak.ac.at

Brazil

CAVICCHIOLI, ANDREA

School of Arts, Sciences and Humanities, University of São Paulo
andrecav@usp.br

CARNEIRO, ARNALDO MANOEL PEREIRA

Universidade Federal de Pernambuco (UFPE)
ampc@ufpe.br

Czech Republic

FRANKEOVÁ, DITA	Institute of Theoretical and Applied Mechanics, v.v.i., Academy of Sciences of the Czech Republic. Prague frankeova@itam.cas.cz
JANOTOVÁ, DANA	Institute of Theoretical and Applied Mechanics, v.v.i., Academy of Sciences of the Czech Republic. Prague janotova@itam.cas.cz
KOZLOVCEV, PETR	Institute of Theoretical and Applied Mechanics, v.v.i., Academy of Sciences of the Czech Republic. Prague kozlovcev@itam.cas.cz
MLSNOVÁ, KATEŘINA	Institute of Theoretical and Applied Mechanics, v.v.i., Academy of Sciences of the Czech Republic. Prague mlsnova@itam.cas.cz
NUNES, CRISTIANA	Institute of Theoretical and Applied Mechanics, v.v.i., Academy of Sciences of the Czech Republic. Prague nunes@itam.cas.cz
REITERMAN, PAVEL	Czech Technical University. Prague pavel.reiterman@fsv.cvut.cz
SLÍŽKOVÁ, ZUZANA	Institute of Theoretical and Applied Mechanics, v.v.i., Academy of Sciences of the Czech Republic. Prague slizkova@itam.cas.cz
SVOROVÁ, SYLWIA	Czech Academy of Sciences, Institute of Inorganic Chemistry. Řež sylviasvorova@gmail.com
TIŠLOVÁ, RENATA	Faculty of Restoration, University of Pardubice. Litomyšl renata.tislova@upce.cz
VÁLEK, JAN	Institute of Theoretical and Applied Mechanics, v.v.i., Academy of Sciences of the Czech Republic. Prague valek@itam.cas.cz
VELISKOVA, KLARA	Academy of Fine Arts. Prague klarakolar@seznam.cz
VYŠVAŘIL, MARTIN	Brno University of Technology, Faculty of Civil Engineering, Brno vysvaril.m@fce.vutbr.cz
ŽIŽLAVSKÝ, TOMÁŠ	Brno University of Technology, Faculty of Civil Engineering, Brno zizlavsky.t@fce.vutbr.cz

Canada

LÉTOURNEAU, PASCAL

DFS Inc. Sainte-Julie
letourneau@dfsarch.com

Cyprus

KYRIAKOU, LOUCAS

Department of Civil and Environmental Engineering,
University of Cyprus
lkyria06@ucy.ac.cy

PHILOKYPROU, MARIA

Department of Architecture, University of Cyprus
mphiloky@ucy.ac.cy

Denmark

HOFFRITZ, SARA

SEIR-materialeanalyse A/S. Helsingør
sara@seir-analyse.dk

SPILE, SANNE

SEIR-materialeanalyse A/S. Helsingør
sanne@seir-analyse.dk

STEINRUD, MICKA

Keim Scandinavia A/S. Hedehusene
micka.steinrud@keim.dk

France

DUCASSE-LAPEYRUSSE, JEAN

Cercle des Partenaires du Patrimoine, Laboratoire de
Recherche des Monuments Historiques. Champs-sur-
Marne
jean.ducasselapeyrusse@gmail.com

DUCHÊNE, STÉPHANIE

Laboratoire de Recherche des Monuments Historiques.
Champs-sur-Marne
Sorbonne Universités, Centre de Recherche sur la
Conservation (CRC, USR 3224), Muséum national
d'Histoire naturelle. Paris
stephanie.duchene@culture.gouv.fr

MARIE-VICTOIRE, ELISABETH

Laboratoire de Recherche des Monuments Historiques.
Champs-sur-Marne; Centre de Recherche sur la
Conservation (CRC), Muséum national d'histoire
naturelle, CNRS. Paris
elisabeth.marie-victoire@culture.gouv.fr

MENCHACATORRE, ÍÑIGO

Chaux de Saint Astier. Aquitaine
i.menchacatorre@C-E-S-A.FR

MENÉNDEZ, BEATRIZ	Géosciences et Environnement, Université de Cergy-Pontoise. Neuville-sur-Oise beatriz.menendez@u-cergy.fr
MIAS, NICOLAS	Paris 1 Université nicolas.mias@gmail.com
NORMAND, LAURA	Laboratoire de Recherche des Monuments Historiques. Champs-sur-Marne. Sorbonne Universités, Centre de Recherche sur la Conservation (CRC, USR 3224), Muséum national d'Histoire naturelle, CNRS. Paris laura.normand.ext@culture.gouv.fr
TEDESCHI, LAURENT	Chaux de Saint Astier. Aquitaine
TOFFOLO, MICHAEL	Institut de Recherche sur les Archéomatériaux-Centre de Recherche en Physique Appliquée à l'Archéologie (IRAMAT-CRP2A), UMR 5060 CNRS, Université Bordeaux Montaigne. Pessac michael.toffolo@u-bordeaux-montaigne.fr
URBANOVÁ, PETRA	Department of Cultural Heritage, University of Padua; IRAMAT-CRPAA, University Bordeaux Montaigne urbanpetra@seznam.cz
VERGÈS-BELMIN, VÉRONIQUE	Cercle des Partenaires du Patrimoine, Laboratoire de Recherche des Monuments Historiques. Champs-sur-Marne veronique.verges-belmin@culture.gouv.fr

Germany

KAISER, CHRISTIAN	Department of Inorganic materials & Recycling, Fraunhofer Institute for Building Physics IBP. Stuttgart christian.kaiser@ibp.fraunhofer.de
KÖBERLE, THOMAS	Technische Universität Dresden, Institut für Geotechnik. Dresden thomas.koerberle@tu-dresden.de
LAUE, STEFFEN	University of Applied Sciences Potsdam, Department for Conservation and Restoration. Potsdam st.laue@fh-potsdam.de
OETINGER, LEA	Department of Inorganic materials & Recycling, Fraunhofer Institute for Building Physics IBP. Stuttgart lea.maria.oetinger@ibp.fraunhofer.de
ZIEGENBALG, GERALD	IBZ-Salzchemie GmbH & Co.KG. Halsbrücke gerald.ziegenbalg@ibz-freiberg.de

Greece

AMENTA, MARIA	Institute of Nanoscience and Nanotechnology, National Centre for Scientific Research "Demokritos". Athens m.amenta@inn.demokritos.gr
GALANOS, AMERIMNI	Lithou Sintirissis Inc. Kifissia. Athens amerimnig@gmail.com
KARATASIOS, IOANNIS	Institute of Nanoscience and Nanotechnology, National Centre for Scientific Research "Demokritos". Athens i.karatasios@inn.demokritos.gr
KAROZOU, ASPASIA	School of Civil Engineering, Aristotle University of Thessaloniki akarozou@gmail.com
KILIKOGLOU, VASSILIS	Institute of Nanoscience and Nanotechnology, National Centre for Scientific Research "Demokritos". Athens v.kilikoglou@inndemokritos.gr
MARAVELAKI, NONI-PAGONA	School of Architecture, Technical University of Crete. Akrotiri. Chania pmaravelaki@isc.tuc.gr
MICHALOPOULOU, ANASTASIA	Institute of Nanoscience and Nanotechnology, National Centre for Scientific Research "Demokritos". Athens School of Architecture, Technical University of Crete. Akrotiri. Chania a.michalopoulou@inn.demokritos.gr
MOROPOULOU, ANTONIA	National Technical University of Athens amoropul@central.ntua.gr
PACHTA, VASILIKI	Lab. of Building Materials, School of Civil Engineering, Aristotle University of Thessaloniki vpachta@civil.auth.gr
PAPAIOANNOU, STAMATOULA	Institute of Nanoscience and Nanotechnology, National Centre for Scientific Research "Demokritos". Athens s.papaioannou@inn.demokritos.gr
PAPAYIANNI, IOANNA	Lab. of Building Materials, School of Civil Engineering, Aristotle University of Thessaloniki papayian@civil.auth.gr
STEFANIDOU, MARIA	Lab. of Building Materials, School of Civil Engineering, Aristotle University of Thessaloniki stefan@civil.auth.gr
TSARDAKA, EIRINI-CHRYSANTHI	Lab. of Building Materials, School of Civil Engineering, Aristotle University of Thessaloniki extsardaka@gmail.com

Hungary

KÓSA, ZSUZSANNA	Department of Engineering Geology and Geotechnics, Budapest University of Technology and Economics kosa.zsuzsanna@epito.bme.hu
PÁPAY, ZITA	Department of Engineering Geology and Geotechnics, Budapest University of Technology and Economics zita.papay@gmail.com
TÖRÖK, ÁKOS	Department of Engineering Geology and Geotechnics, Budapest University of Technology and Economics torokakos@mail.bme.hu

India

MANOHAR, SWATHY	Department of Civil Engineering, Indian Institute of Technology. Madras swathymanohar@yahoo.com
RANI, DIVYA	Department of Civil Engineering, Indian Institute of Technology. Madras divyalino@gmail.com

Ireland

PAVÍA, SARA	Trinity College Dublin pavias@tcd.ie
-------------	---

Italy

BENINCASA, ALESSIO	SINT Technology. Calenzano. Firenze alessio.benincasa@sintechnology.com
BUGINI, ROBERTO	Istituto CNR Conservazione Beni Culturali. Milano bugini@icvbc.cnr.it
CASADEI, PAOLO	Kerakoll Spa. Sassuolo. Modena paolo.casadei@kerakoll.com
RICCI, GIULIA	University of Padova, Inter-Departmental Research Center for the Study of Cement Materials and Hydraulic Binders (CIRCe); University of Padova, Department of Geosciences giulia.ricci@unipd.it
SASSONI, ENRICO	Department of Civil, Chemical, Environmental & Materials Engineering (DICAM), University of Bologna enrico.sassoni2@unibo.it

SECCO, MICHELE

University of Padova, Department of Civil, Environmental and Architectural Engineering (ICEA); University of Padova, Inter-Departmental Research Center for the Study of Cement Materials and Hydraulic Binders (CIRCe)
michele.secco@unipd.it

ZUENA, MARTINA

Institute of Condensed Matter Chemistry and Technologies for Energy, CNR. Padova
martinazuena@gmail.com

Malta

PASIAN, CHIARA

Department of Conservation and Built Heritage, University of Malta
chiara.pasian@um.edu.mt

PORTER, JENNIFER

Department of Conservation and Built Heritage, University of Malta
jennifer.porter@um.edu.mt

Mexico

SÁMANO CHONG, MARLENE

Traditional Technology and Sustainability Laboratory at the National School of Conservation, Restoration & Museography of the National Institute of Anthropology and History. Mexico City
marlene_samano_c@encrym.edu.mx

Norway

ANDRIULO, FABRIZIO

Museum of Cultural History, University of Oslo
fabrizio.andriulo@khm.uio.no

Poland

DYDA, MAGDALENA

Research and Development for Life Sciences Ltd. (RDLS); Faculty of Biology, University of Warsaw
magdalena.dyda@rdls.pl

RODEK, ŁUKASZ

Research and Development for Life Sciences Ltd. (RDLS). Warsaw
lukasz.rodek@rdls.pl

Portugal

CARVALHO, CAROLINA	Parques de Sintra e Monte da Lua SA. Sintra carolina.carvalho@parquesdesintra.pt
CHUA, ALVIN SERN HAO	Laboratório HERCULES. Universidade de Évora alvinchuash@yahoo.com
FARIA, PAULINA	CERIS and Civil Engineering Department, FCT, NOVA University of Lisbon. Monte da Caparica paulina.faria@fct.unl.pt
FREIRE, MARIA TERESA	National Laboratory for Civil Engineering, LNEC. Lisbon mtfreire@gmail.com
GALACHO, PAULA CRISTINA	Laboratório HERCULES. Universidade de Évora pcg@uevora.pt
GIRGINOVA, PENKA	Laboratório HERCULES. Universidade de Évora; National Laboratory for Civil Engineering, LNEC. Lisbon penka@uevora.pt
GOMES, MARIA IDÁLIA DA SILVA	Department of Civil Engineering, ISEL, Polytechnic Institute of Lisbon idaliagomes@dec.isel.pt
LIMA FERREIRA, JOSÉ	Faculty of Architecture, University of Lisbon jose.lima.ferreira@gmail.com
MARCO, ALEXANDRA	School of Arts; CITAR – Research Centre for Science and Technology on Arts; CBQF – Centre for Biotechnology and Fine Chemistry, Portuguese Catholic University, Oporto alexandra.marco.ma@gmail.com
MOITA, PATRÍCIA SOFIA	Laboratório HERCULES. Universidade de Évora pmoita@uevora.pt
SANTOS SILVA, ANTÓNIO	Materials Department, National Laboratory for Civil Engineering, LNEC. Lisbon ssilva@lnec.pt
SANTOS, MARTA	Faculty of Architecture, University of Lisbon marta.rodriques.santos@gmail.com
TORRES, ISABEL	Department of Civil Engineering, University of Coimbra; ADAI/LAETA, Association for the Development of Industrial Aerodynamics; ITeCons itorres@dec.uc.pt
VEIGA, MARIA DO ROSÁRIO	Buildings Department, National Laboratory for Civil Engineering, LNEC. Lisbon rveiga@lnec.pt
VELOSA, ANA	Civil Engineering Department, Universidade de Aveiro avelosa@ua.pt

Serbia

AŠKRABIĆ, MARINA	Faculty of Civil Engineering, University of Belgrade amarina@grf.bg.ac.rs
RANOGAJEC, JONJAUA	Faculty of Technology, University of Novi Sad janjar@uns.ac.rs
VUČETIĆ, SNEŽANA	Faculty of Technology, University of Novi Sad snezanap@uns.ac.rs

Slovenia

BOKAN- BOSILJKOV, VIOLETA	Faculty of Civil and Geodetic Engineering, University of Ljubljana violeta.bokan-bosiljkov@fgg.uni-lj.si
PADOVNIK, ANDREJA	Faculty of Civil and Geodetic Engineering, University of Ljubljana andreja.padovnik@fgg.uni-lj.si
ŠTUKOVNIK, PETRA	Faculty of Civil and Geodetic Engineering, University of Ljubljana petra.stukovnik@fgg.uni-lj.si

Spain

ÁLVAREZ , JOSÉ IGNACIO	Department of Chemistry, University of Navarra jalvarez@unav.es
BARBERO BARRERA, MAR	Departamento de Construcción y Tecnologías Arquitectónicas, Universidad Politécnica de Madrid mar.barbero@upm.es
CASAS COTS, ITA	CEMENTOS COLLET S.L. Guardiola De Berguedà. Barcelona info@cementoscollet.com
CASAS COTS, MARIÀ	CEMENTOS COLLET S.L. Guardiola De Berguedà. Barcelona info@cementoscollet.com
DOBÓN, JOSÉ	Kerakoll Ibérica. Castellón de la Plana. Castellón jose.dobon@kerakoll.es
DURÁN BENITO, ADRIÁN	Department of Chemistry, University of Navarra adrianduran@unav.es
ERGENÇ, DUYGU	Instituto de Geociencias, IGEO (CSIC-UCM). Madrid duyguerg@ucm.es
FERNÁNDEZ, JOSÉ MARÍA	Department of Chemistry, University of Navarra jmfdez@unav.es

GARCÍA LEMOS, MARTIN	Gordillo's Cal de Morón. Morón de la Frontera. Sevilla info@gordilloscaldemoron.com
GÓMEZ-VAL, RICARDO	Universitat Politècnica de Catalunya, Barcelona ricardo.jose.gomez@upc.edu
GONZÁLEZ PORTILLO, ANTONIO	Arte Conservación y Restauración SL (Ártyco). Madrid toniogp@gmail.com
GONZÁLEZ-SÁNCHEZ, JESÚS FIDEL	Department of Chemistry, University of Navarra jgonzalez.65@alumni.unav.es
GONZÁLEZ-SERRANO, ANA	Department of Architectural Constructions I, University of Seville gserrano@us.es
GORDILLO MESA, ISIDORO	Gordillo's Cal de Morón. Morón de la Frontera. Sevilla info@gordilloscaldemoron.com
GUASCH FERRÉ, NÚRIA	Departament d'Arts i Conservació-Restauració. Facultat de Belles Arts, Universitat de Barcelona nuriaguaschferre@gmail.com
GUERRA-GARCÍA, PABLO	Universidad Politécnica de Madrid p.guerra.garcia@sapac.es
LLOBET FONT, SILVIA	ÀBAC. Conservació-Restauració, SL. Castellar del Vallès. Barcelona silvia@abac-sl.cat
LUZURIAGA CATALÁN, CRISTINA	Department of Chemistry, University of Navarra cluzuriaga@unav.es
MANZANO CABRERA, JORGE	University of Las Palmas de Gran Canaria jorge.manzano@ulpg.es
MARTÍNEZ RAMÍREZ, SAGRARIO	Instituto de Estructura de la Materia, CSIC. Madrid sagrario.martinez@csic.es
MAS-BARBERÀ, XAVIER	Universitat Politècnica de València jamasbar@upvnet.upv.es
MAYO CORROCHANO, CRISTINA	Analysis and Intervention in Architectural Heritage (AIPA) research group, Polytechnic University of Madrid cristina@estudiomayo.com
MOLINAS DAVÍ, MARIA	ÀBAC. Conservació-Restauració, SL. Castellar del Vallès. Barcelona maria@abac-sl.cat
MORENO FERNÁNDEZ, ESTHER	Departamento de Construcción y Tecnología Arquitectónica, Escuela Técnica Superior de Arquitectura de la Universidad Politécnica de Madrid esther.moreno@upm.es

NAVARRO EZQUERRA, ANTONIA	Department of Technology of Architecture, GICITED research group, Polytechnic School of Building (EPSEB) of Barcelona antonia.navarro@upc.edu
NAVARRO-BLASCO, ÍÑIGO	Department of Chemistry, University of Navarra inavarro@unav.es
OCAMPO RODRÍGUEZ, JESÚS	Universitat Politècnica de Catalunya. Barcelona jjocamporodriguez@gmail.com
ONTIVEROS-ORTEGA, ESTHER	Laboratory of Geology, Andalusian Historical Heritage Institute. Seville esther.ontiveros@juntadeandalucia.es
PETITJEAN, MAX RENAUD	Department of Chemistry, University of Navarra mpetitjean@alumni.unav.es
PIQUÉ PALACÍN, GEMMA	Restauradora-conservadora de béns culturals. Linyola. Lleida arquitrau@gmail.com
PONCE-ANTÓN, GRACIELA	Department of Mineralogy and Petrology, Science and Technology Faculty, University of the Basque Country (UPV/EHU). Leioa. Bizkaia graciela.ponce@ehu.eus
PUIG RIGALL, JOAN	Department of Chemistry, University of Navarra jpuig.2@alumni.unav.es
RAMÍREZ CASAS, JUDITH	Department of Technology of Architecture, GICITED research group, Polytechnic School of Building (EPSEB) of Barcelona judith.ramirez@upc.edu
RODRÍGUEZ, JUAN ANTONIO	Gordillo's Cal de Morón. Morón de la Frontera. Sevilla jarodrigueher@HOTMAIL.COM
RODRÍGUEZ-GARCÍA, REYES	Department of Architectural Constructions I, University of Seville rgarcia@us.es
SALGUERO MARTÍNEZ, JAIME	Restaurador Autónomo. Barcelona jaimesalguer@gmail.com
SÁNCHEZ, JOSÉ LUIS	Kerakoll Ibérica. Castellón de la Plana. Castellón jose.sanchez@kerakoll.es
SANZ ARAUZ, DAVID	Universidad Politécnica de Madrid david.sanz.arauz@upm.es
SERRA CLAVERA, ÀGUEDA	Gabinet del Color S.L. Barcelona gabinet@gabinetdelcolor.com

SIRERA BEJARANO, RAFAEL
Department of Chemistry, University of Navarra
rsirera@unav.es

SORIA, MIGUEL ÁNGEL
Kerakoll Ibérica. Castellón de la Plana. Castellón
miguel.soria@kerakoll.es

SPEZIALE, ALESSANDRO
Department of Chemistry, University of Navarra
aspeziale@alumni.unav.es

ZURBANO, FÉLIX
Kerakoll Ibérica. Castellón de la Plana. Castellón
Felixkera@gmail.com

Sweden

BALKSTEN, KRISTIN
Balksten Byggnadsvard AB. Munkedal
kristin.balksten@konstvet.uu.se

Switzerland

CAROSELLI, MARTA
Institute of Materials and Constructions (IMC), University
of Applied Sciences and Arts of Southern Switzerland
(SUPSI). Manno
marta.caroselli@supsi.ch

CAVALLO, GIOVANNI
Institute of Materials and Constructions (IMC), University
of Applied Sciences and Arts of Southern Switzerland
(SUPSI). Manno
giovanni.cavallo@supsi.ch

GOSSELIN, CHRISTOPHE
Geotest SA, Le Mont sur Lausanne
Christophe.Gosselin@geotest.ch

JORNET, ALBERT
Institute of Materials and Constructions (IMC), University
of Applied Sciences and Arts of Southern Switzerland
(SUPSI). Manno
albert.jornet@supsi.ch

Taiwan

HSU, MEI TSE
Institute of Mineral Resources Engineering, National
Taipei University of Technology. Taipei
matt85208@gmail.com

The Netherlands

GROOT, CASPAR
Consultant. Delft
C.J.W.P.Groot@tudelft.nl

LUBELLI, BARBARA
Delft University of Technology
b.lubelli@tudelft.nl

The Philippines

CAYME, JAN-MICHAEL

De La Salle University. Manila
jan-michael.cayme@dlsu.edu.ph

KALAW, JIM

National Historical Commission of the Philippines. Manila
jim_kalaw@yahoo.com

Turkey

TASCI, BURCU

Department of Architecture, Izmir Katip Çelebi University
burcutasci@iyte.edu.tr

U.K.

DE NARDI, CRISTINA

School of Engineering, Cardiff University
denardic@cardiff.ac.uk

FUSADE, LUCIE

School of Geography and the Environment, University of Oxford
lucie.fusade@ouce.ox.ac.uk

HUGHES, JOHN

University of the West of Scotland, Glasgow
john.hughes@uws.ac.uk

PESCE, CECILIA

Department of Architecture and Built Environment,
Northumbria University, Newcastle upon Tyne
cecilia.pesce@northumbria.ac.uk

PHILLIPS, GRACE

University of Bath
gap37@bath.ac.uk

STRANG, KATIE

Scottish Lime Centre Trust. Charlestown. Dunfermline
lab@scotlime.org

SU, TUĞÇE BÜŞRA

University of Bath
tbs31@bath.ac.uk

THACKER, MARK

University of Stirling
mark.thacker@stir.ac.uk

U.S.A.

EDISON, MICHAEL P.	Edison Coatings, Inc. Plainville. Connecticut; Society for the Preservation of Historic Cements, Inc. edisoncoatings@msn.com
GULOTTA, DAVIDE	Science Department, Getty Conservation Institute. Los Angeles dgulotta@getty.edu
LAUSBERG, CHAD	Edison Coatings, Inc. Plainville. Connecticut chad@edisoncoatings.com
LESLIE, ALICK	Science Department, Getty Conservation Institute. Los Angeles alick_leslie@yahoo.co.uk
WILKIE, SIMEON	Science Department, Getty Conservation Institute. Los Angeles s.z.wilkie@dundee.ac.uk





5th Historic Mortars Conference

HMC 2019

Contributors

University of Navarra, Pamplona

19th – 21st June, 2019

A

Addis, Anna
Aichinger, Edit
Alexopoulos, Nikolaos D.
Almeida, Luís
Alonso-Fernández, Carmen
Alonso-Olazabal, Ainhoa
Álvarez, José Ignacio
Aly, Marwa
Aly, Nevin
Amenta, Maria
Anghelone, Marta
Artioli, Gilberto
Aškrabić, Marina
Asscher, Yotam

B

Bader, Tobias
Badia, Marta
Balksten, Kristin
Ball, Richard J.
Baragona, Anthony
Barbero Barrera, María del Mar
Bartůňková, L.
Batres Hernández, David Osmar
Bauerová, Pavla
Bayer, Patrik
Bento Torres, Joana
Berberidou, Emmanouela
Bernou, Semha
Bläuer, Christine
Boaretto, Elisabetta
Boffill Orama, Yosbel
Bokan Bosiljkov, Violeta
Böke, Hasan
Bonetto, Jacopo
Bouichou, Myriam
Briggs, Kevin
Buchwald-Ziecina, Oliwia

Bugini, Roberto
Buill Pozuelo, Felipe
Bustamante, Rosa

C

Calabria Holley, Juliana
Candeias, António
Cantisani, Emma
Carneiro, Arnaldo Manoel Pereira
Caroselli, Marta
Casadei, Paolo
Casadevall, Joan
Casas Duocastella, Lluís
Cascales, Ignacio
Cassitti, Patrick
Cather, Sharon
Cavalcanti Ferreira, Fernanda
Cavallo, Giovanni
Cavicchioli, Andrea
Cayme, Jan-Michael
Chua, Alvin Sern Hao
Coelho, Flávia
Correia, Maria João

D

Dandrel, Claire
David, John
De Brito, Jorge
De Nardi, Cristina
Debono, Nathalie
Díaz, José
Díaz Gonçalves, Teresa
Díaz-Ramos, Isolina
Diekamp, Anja
Dilaria, Simone
Ditta, Asim Allah
Doménech-Carbó, María Teresa
Drabik, Paulina
Drdácký, Miloš

Dubernet, Stéphan
 Ducasse-Lapeyrusse, Jean
 Duchêne, Stéphanie
 Durán Benito, Adrián
 Dyda, Magdalena
 Dyer, Thomas

E

Edison, Michael P.
 El-Boudjay, Abdelatif
 Elimelech, Chen
 Ergenç, Duygu

F

Faiz, Mouna
 Faria, Paulina
 Favvas, Evangelos
 Feldman, Steven
 Fernández, Francisco
 Fernández Álvarez, José María
 Ferreira Sodrê dos Santos, Isabela
 Flores Colen, Inês
 Folli, Luisa
 Fort, Rafael
 Frankeová, Dita
 Franzoni, Elisa
 Fratini, Fabio
 Fredrich, Birgit
 Freire, Maria Teresa
 Fenzke, Alexander
 Fusade, Lucie

G

Galacho, P. Cristina Gonçalves Pereira
 Galvão Leite, Maria Raquel
 Garbin, Enrico
 Gilento, Piero

Giollo, Rodrigo
 Giovannacci, David
 Girardello, Paolo
 Girginova, Penka Ilieva
 Gomes, Leandro
 Gomes, Maria Idália
 Gomes de Sousa, Jose Getulio
 Gomes Sant'Anna, Lucy
 Gómez-Val, Ricardo
 Gómez Villaba, Luz Stella
 González Portillo, Antonio
 González Sánchez, Belén
 González-Sánchez, Jesús Fidel
 González-Serrano, Ana
 González Yunta, Francisco
 Gosselin, Christophe
 Gournis, Dimitris
 Grillini, Gian Carlo
 Grom, Janez Peter
 Guasch-Ferré, Núria
 Guerra-García, Pablo
 Gulotta, Davide

H

Hajdas, Irka
 Harbottle, Michael
 Hemedá, Sayed
 Henry, Alison
 Henry, Olivier
 Higuera, Laura R.
 Hirszenberger, Helena
 Hsu, Mei-Tse
 Hughes, David
 Hughes, John J.
 Hüglin, Sophie

I

Iglesias-Campos, Manuel
 Ioannou, Ioannis

J

Jakubičková, Michaela
 Janotová, Dana
 Jefferson, Anthony
 Jiménez-Echevarría, Javier
 Jornet, Albert
 Julià i Macias, Manuel

Leslie, Alick
 Lima Ferreira, José
 Lino, Alfonso
 Lindqvist, Jan-Erik
 Llera, Fátima
 Lombillo Vozmediano, Ignacio
 Lubelli, Barbara
 Luxán Gómez del Campillo, María Pilar

K

Kaiser, Christian
 Kalaw, Jim Franklin O.
 Kallithrakas-Kontos, Nikolaos
 Kalogirou, Maria
 Kaplan-Ashiri, Ifat
 Kapridaki, Chrysi
 Karatasios, Ioannis
 Karozou, Aspasia
 Kassab, Tsouira
 Katsiotis, Marios S.
 Keppert, Martin
 Kilian, Ralf
 Kilikoglou, Vassilis
 Kimura Moreira, João Guilherme
 Köberle, Thomas
 Korzeniowski, Sławomir
 Kósa, Zsuzsanna
 Kourkoulis, Stavros K.
 Kovařík, Z.
 Kozlovcev, Petr
 Krajíček, V.
 Kumpová, Ivana
 Kwiatkowska-Kopka, Beata
 Kyriakou, Loucas

L

Lacasta Palacio, Ana María
 Laue, Steffen
 Lausberg, Chad

M

Mácová, Petra
 Majoroš, P.
 Malesevic-Cuculis, Maria
 Manohar, Swathy
 Manzano Cabrera, Jorge
 Maravelaki, Noni-Pagona
 Marchante, Patrícia
 Marco, Alexandra
 Marie-Victoire, Elisabeth
 Marinšek, Marjan
 Marques, Carlos
 Martín-Garrido, Moisés
 Martínez de Tejada, Guillermo
 Martínez-Ramírez, Sagrario
 Martinho, Cláudia
 Marzaioli, Fabio
 Mas i Barberà, Xavier
 Mayo Corrochano, Cristina
 McCaig, Iain
 Menchon, Joan
 Menéndez, Beatriz
 Metaxa, Zoi S.
 Michailidi, Elisavet
 Michalopoulou, Anastasia
 Michoinová, Dagmar
 Milan van der Bergh, John
 Miličić, Ljiljana
 Mintz, Eugenia
 Mirão, José António Paulo
 Mlsnová, Kateřina

Moita, Patrícia Sofia Martins
Moreira, Patrícia Raquel
Moreno Fernández, Esther
Morín de Pablos, Jorge
Moropoulou, Antonia
Moutinho, Sara

N

Nabais, João
Naguit Jr., Raul Y.
Navarro-Blasco, Íñigo
Navarro Ezquerro, Antonia
Neukom, Hans
Nijland, Timo G.
Nitz, Bo
Nodari, Luca
Normand, Laura
Nowik, Witold
Nunes, Cristiana

O

Odling, Nic
Oetinger, Lea Maria
Ontiveros-Ortega, Esther
Ortega, Luis Angel

P

Pachta, Vasiliki
Padovnik, Andreja
Panizza, Matteo
Papadimitriou, Dimitris
Papaioannou, Stamatoula
Pápay, Zita
Papayianni, Ioanna
Pasian, Chiara
Passariello, Isabella
Pavía, Sara
Pesce, Cecilia

Pesce, Giovanni
Phillips, Grace A.
Philokyrou, Maria
Pinilla Melo, Javier
Pintado, Manuela
Pintér, Farkas
Piqué, Francesca
Pitarch Marti, Àfrica
Pizzigatti, Cesare
Pombo, Isabel
Ponce-Antón, Graciela
Porter, Jennifer
Póvoas, Rui
Prada, José Luis
Previato, Caterina
Prošek, Zdeněk
Pyzik, Adam

Q

Quaresma, José Carlos

R

Ramírez-Casas, Judith
Rani Shreekumar, Divya
Ranogajec, Jonjaua
Regev, Lior
Reiterman, Pavel
Ricci, Giulia
Rigopoulos, Ioannis
Rivas Guevara, Bryan
Rodríguez-García, Reyes
Romero, Maximina
Rosell Amigó, Joan Ramon
Rosell Colomina, Jaume
Rovnaníková, Pavla
Ruegenberg, Frowin

S

Salameh, Michel
 Sámano Chong, Marlene
 Sánchez Ramos, Isabel
 Santhanam, Manu
 Santos, Ana Rita
 Santos, Marta
 Santos Silva, António
 Santos, Tânia
 Sanz-Arauz, David
 Sassoni, Enrico
 Savić, Aleksandar
 Schidlowski, Martin
 Secco, Michele
 Sepulcre Aguilar, Alberto
 Serra, Àgueda
 Ševčík, Radek
 Siedel, Heiner
 Sierra Fernández, Aranzazu
 Silva, Pilar
 Silveira, Dora
 Sirera, Rafael
 Skłodowska, Aleksandra
 Skružná, Olga
 Slížková, Zuzana
 Speziale, Alessandro
 Spyriliotis, Thomas
 Starinieri, Vincenzo
 Stefanidou, Maria
 Štukovnik, Petra
 Su, Tugce Busra
 Šubrt, Jan
 Svora, Petr
 Svorová Pawelkowicz, Sylwia
 Szlek, Karolina

T

Tamburini, Sergio
 Taşcı, Burcu

Teixeira, André
 Terrapon, Noé
 Terrasi, Filippo
 Thacker, Mark
 Theodoridou, Magdalini
 Thorn, Andrew
 Tinturé, Antónia
 Tišlová, Renata
 Toffolo, Michael B.
 Tomasin, Patrizia
 Török, Ákos
 Torres, Isabel
 Tous Coll, Marc
 Travincas, Rafael
 Triantafyllaki, Sofia
 Tsardaka, Eirini-Chrysanthi

U

Urbanová, Petra

V

Válek, Jan
 Van Hees, Rob P.J.
 Van Zuiden, Aliza
 Veiga, Maria do Rosário
 Vejmelková, Eva
 Velosa, Ana
 Vergès-Belmin, Véronique
 Viani, Alberto
 Vidovszky, István
 Vieira, Eduarda
 Všíanský, D.
 Vučetić, Snežana
 Vyšvařil, Martin

W

Wacha, Robert
 Weber, Johannes

Wilhelm, Katrin

Wilkie, Simeon

Wilkojc, Ewa

X

Xekoukoulotakis, Nikolaos

Xynidis, Nikolaos

Y

Yu, Bing-Sheng

Z

Zakić, Dimitrije

Žižlavský, Tomáš

Zötzl, M.

Zuena, Martina

Zuluaga, María Cruz



5th Historic Mortars Conference

HMC 2019

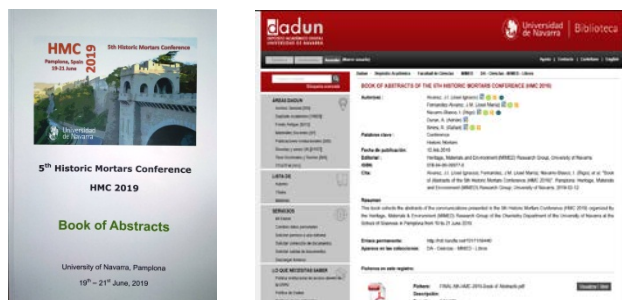
Publications

University of Navarra, Pamplona

19th – 21st June, 2019

Book of Abstracts

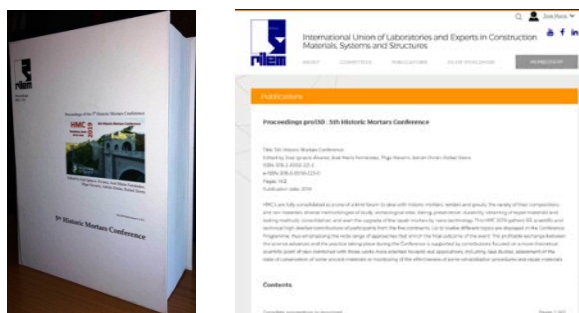
The Book of Abstracts will permanently be accessible in the repository of the University of Navarra in the following address: <http://hdl.handle.net/10171/56440>



Book of Proceedings

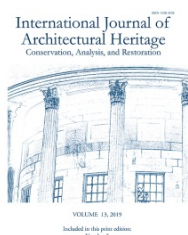
The Book of Proceedings has been published by RILEM in its Series under number PRO130 and can be downloaded from their webpage in the address:

<https://www.rilem.net/publication/publication/494>



International Journal of Architectural Heritage

This Journal has devoted an issue to a selection of papers presented at HMC 2019 (Volume 14, 2020 - Issue 7: Selected papers from HMC 2019 – 5th Historic Mortars Conference) which has been presented by Prof. Álvarez in the Editorial entitled “Historic Mortars and New Repair Materials for the Architectural Heritage”.



Pictures

An album with pictures taken along the HMC 2019 can be accessed in the address:

<https://photos.app.goo.gl/VNfEwqz1qYhDnUDy6>



5th Historic Mortars Conference – HMC 2019
Pamplona, 19th-21st June 2019

This 5th HMC is a RILEM co-sponsored event and the organization has been supported in part by the Ministry of Economy and Competitiveness (MINECO) under project MAT2015-70728-P. The companies Puma Group, Heidelberg Cement, Saint-Astier, Kerakoll, Lhoist, Gordillos Cal de Morón, SINT Technology have provided funds.

© MIMED (Heritage, Materials and Environment) Research Group

mimed@unav.edu

<https://www.unav.edu/en/web/heritage-materials-environment/home>

Currently:

MATCH (Materials and Cultural Heritage) Research Group

match@unav.edu

<https://www.unav.edu/web/materials-and-cultural-heritage/home>

Department of Chemistry

School of Sciences

Universidad de Navarra

www.unav.edu

URL: <http://hdl.handle.net/10171/56440>



Universidad
de Navarra