5th Historic Mortars Conference

HMC 2019

Programme

University of Navarra, Pamplona

19th – 21st June, 2019
<table>
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<tr>
<th>Time</th>
<th>Tuesday, 18(^{th})</th>
<th>Wednesday, 19(^{th})</th>
<th>Thursday, 20(^{th})</th>
<th>Friday, 21(^{st})</th>
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<tr>
<td>09.00-09.30</td>
<td>Opening Session</td>
<td>T 12.2</td>
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<td>Main Auditorium</td>
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<tr>
<td>11.00-11.30</td>
<td>Coffee Break</td>
<td>T 5.2</td>
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<td></td>
<td>Inaugural Conference</td>
<td>Amphitheatre Room 10</td>
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<td>Main Auditorium</td>
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<td>11.30-13.30</td>
<td>T 5.1</td>
<td>T 7.1</td>
<td>T 7.2</td>
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<td>Main auditorium</td>
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<td>T 10</td>
<td>11.30-13.30</td>
<td>Main Auditorium</td>
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<td>Amphitheatre Room 10</td>
<td>T 3.1</td>
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<td>11.30-13.30</td>
<td>Amphitheatre Room 10</td>
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<td>11.30-12.30</td>
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<tr>
<td>13.30-15.00</td>
<td>Lunch</td>
<td>13.30-15.00</td>
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<td>15.00-17.00</td>
<td>T 9.1</td>
<td>T 12.1</td>
<td>15.00-15.30</td>
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<td>Main auditorium</td>
<td>T 1</td>
<td>Bus to Olite</td>
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<td></td>
<td>T 4.1</td>
<td>15.00-16.30</td>
<td>Technical Presentations by Gvido’s Cal de Morón</td>
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<td>Amphitheatre Room 10</td>
<td>Main auditorium</td>
<td>and by SINT Technology</td>
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<td>15.30-17.30</td>
<td>T 5.3</td>
<td>15.30-17.30</td>
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<td></td>
<td>16.30-17.00</td>
<td>Room 21</td>
<td>Visit to the Castle of the Kings of Navarra</td>
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<td></td>
<td>Coffee Break</td>
<td>17.00-17.30</td>
<td>and Church of S. María (XIII C.) in Olite</td>
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<td></td>
<td>Workshop &amp; Exhibition (Lab. 012)</td>
<td>17.30-18.00</td>
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<td>17.30-18.30</td>
<td>Guided visit to the Museum of the</td>
<td>17.30-18.00</td>
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<td>Registration</td>
<td>University of Navarra. Gala dinner</td>
<td>Bus to Otazu</td>
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<td>Hall of Science Library</td>
<td>18.00-19.00</td>
<td>18.00-21.30</td>
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<td>building</td>
<td>T 12.3</td>
<td>Visit to the Otazu Manor and the Bodega</td>
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<td></td>
<td>17.30-18.30</td>
<td>POSTERS</td>
<td>Otazu winery. Cocktail dinner</td>
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<td>Technical visit: Cloister of</td>
<td>T 11.1</td>
<td>18.00-21.30</td>
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<td></td>
<td>the Cathedral of Pamplona</td>
<td>T 8</td>
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<td>19.30-20.30</td>
<td>Guided visit to the Museum of the</td>
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<td>University of Navarra. Gala dinner</td>
<td>21.30-22.00</td>
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<td>20.00-23.00</td>
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HMC 2019. University of Navarra. Pamplona, 19\(^{th}\) - 21\(^{st}\) June 2019
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


**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

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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<tbody>
<tr>
<td>11.30</td>
<td>A map is worth a thousand pictures: The application of FTIR-mapping to the analysis of petrographic thin sections of historical and experimental mortar</td>
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<tr>
<td>11.45</td>
<td>Calcite or quartz powder as aggregate of Roman plasters (Lombardy, Italy)</td>
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<tr>
<td>12.00</td>
<td>Characterisation methodology for lime based materials – A case study of the Rajagopuram of Pundarikaksha temple in Tamil Nadu, India</td>
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<tr>
<td>12.15</td>
<td>Characterisation of concrete structures along the Reschen frontier, South Tyrol, Italy</td>
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<tr>
<td>12.30</td>
<td>Chemical, mineralogical and hydraulic characteristics of Roman mortars in Turkey</td>
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<tr>
<td>12.45</td>
<td>Provenance study of raw materials used for lime making at Prague Castle during Medieval times</td>
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</tbody>
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11.30-13.30  **Topic 10** (Amphitheatre)  
Chair: John Hughes, Davide Gulotta

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<tr>
<th>Time</th>
<th>Session</th>
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<tr>
<td>11.30</td>
<td>Evolution of mortars composition and characteristics during the 20th century – Study of Portuguese buildings awarded with Architecture Válmor Prize</td>
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<tr>
<td>11.45</td>
<td>The restoration of the church of Our Lady of the Assumption, Dauis, Bohol, Philippines</td>
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<tr>
<td>12.00</td>
<td>The analysis of the proportion of mortar for Japanese roof tile (Ibusikawara) in Taiwan by applying of Taguchi Method</td>
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<td>12.15</td>
<td>The use of dolomitic lime in mortar samples from a 15th-century buttress of York Minster (York, UK)</td>
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<tr>
<td>12.30</td>
<td>Digital image analysis as basic for the evaluation of mortars in architectural conservation</td>
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<tr>
<td>12.45</td>
<td>Decorative renders simulating stone of middle 20th century in the region of Lisbon</td>
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13.30-15.00  **Buffet Lunch**
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<tr>
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<th>Topic 1 (Amphitheatre)</th>
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<tr>
<td>15.00</td>
<td>Characterization and compatibility assessment of commercial stone repair mortars</td>
<td>Earth-based plasters – the effect of anhydrite stabilization.</td>
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<tr>
<td>15.15</td>
<td>Improvements to water, salt-scaling and freeze-thaw resistances of historic mortar replication mixes</td>
<td>Similar appearance of mortar and brick masses in Algiers Casbah houses during the Ottoman period (16th - early 18th centuries)</td>
</tr>
<tr>
<td>15.30</td>
<td>Use of ultrafine mafic rocks for the enhancement of carbonation reaction in lime renders</td>
<td>Assessment of adhesive strength of an earth plaster on different substrates through different methods</td>
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<tr>
<td>15.45</td>
<td>The impact of elevated temperatures on the properties of lime-based mortars</td>
<td>Earth-based plasters: the influence of clay mineralogy</td>
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<tr>
<td>16.00</td>
<td>A grout and mortar system for fine cracks and shallow surface fills in Carrara marble</td>
<td>Earth-based and binder-based mortars comparison</td>
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<td>16.15</td>
<td>An innovative way for testing adhesion of non-structural injection grouts for the stabilisation of historic mortars</td>
<td>Earth-based and current plasters: assessment of efficiency and contribution to indoor air quality</td>
</tr>
<tr>
<td>16.30</td>
<td>NHL-based plasters and renders – Assessing the influence of mixing method on workability and hardened mortar properties</td>
<td>Earthen plasters based on illitic clayish earth – the influence of calcitic lime addition</td>
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<tr>
<td>16.45</td>
<td>Comparing the moisture permeability of limecrete and concrete floor slabs</td>
<td>Rescuing the manufacturing process of traditional mortars present on XIX-century earthen buildings in Brazil</td>
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**Coffee Break**

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<tr>
<th>Time</th>
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<th>Topic 8 (Amphitheatre)</th>
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<tbody>
<tr>
<td>17.30</td>
<td>Comparative analysis of permeability values of traditional aerial lime mortars for preventive conservation</td>
<td>Structural characterization and thermal decomposition of lime binders allow accurate radiocarbon age determinations</td>
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<tr>
<td>17.45</td>
<td>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</td>
<td>An Ecology of Castle Construction: geoarchaeology, archaeobotany &amp; radiocarbon analysis in the ecotone of Lochindorb Castle</td>
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<tr>
<td>18.00</td>
<td>Preliminary results on the use of ammonium phosphate solutions for the consolidation of lime-based mortars</td>
<td>The latest advances on Single grain OSL dating of mortars and their integration in early medieval archaeology</td>
</tr>
<tr>
<td>18.15</td>
<td>Characterization and Radiocarbon dating of complex mortars in Historic Buildings</td>
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**Visit to the restoration of the Cloister of the Cathedral of Pamplona**

Meeting Point: atrium of the Cathedral
# Thursday, 20th June

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<tr>
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<tr>
<td>09.00</td>
<td>Impact of guar gum and chitosan ethers on physico-mechanical properties and durability of natural hydraulic lime mortars</td>
<td>Roman vs. medieval crushed brick lime mortars: A comparative study</td>
<td>Blast furnace slag in historic mortars from Bergslagen, Sweden</td>
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<tr>
<td>09.15</td>
<td>Lime-based grouts for architectural surface repair. Comparison of their performance by using laboratory and field test methods</td>
<td>Sampling cataloging methodology procedures for the conservation of historical colours in urban landscapes</td>
<td>A Mortar Maker’s guide to evolving mortar specifications in 18th and 19th C France and England and their implications today</td>
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<tr>
<td>09.30</td>
<td>Limestone-filled, hydraulic-lime mortars for historic and traditional fabrics</td>
<td>Analytical and chromatic characterization of the interior walls finishes in the Batlló House of Gaudi in Barcelona. A surprising discovery</td>
<td>Preliminary research on potential raw material sources for dolomitic lime mortars at St John convent at Müstair, Switzerland</td>
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<td>09.45</td>
<td>Lime-based mortars. Relationships between composition parameters and mechanical strength</td>
<td>Mineralogical characterization of historical cement-based mortar from Rupnik military fortification line</td>
<td>Pozzolanicity beyond Vitruvius: insights into the exploitation of reactive silicates throughout the Roman world</td>
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<tr>
<td>10.00</td>
<td>Lime-pozzolan injection grouts with ovalbumin and ethanol added as water-reducing agents: grout design and assessment of the mineralogical evolution</td>
<td>Algarve vernacular architecture facade ornaments: chemical, physical and mechanical characterization</td>
<td>Composition and Technology of the 17th Century Stucco Decorations at Červená Lhota Castle in the Southern Bohemia</td>
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<tr>
<td>10.15</td>
<td>Microstructure of lime pastes with the addition of vegetable oils</td>
<td>Medieval mortar, stone and repair mortar of an abandoned Medieval Church, compatibility issues: example from Hungary</td>
<td>Hot applied lime mortar – assessment of a traditional technique used in modern restoration</td>
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<td>10.30</td>
<td>Effects of natural zeolite addition to lime based render layers for restoration of historical buildings</td>
<td>Interpretation of scientific data derived from analytical techniques used in the characterisation of Roman mortars</td>
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<td>10.45</td>
<td>Formulated lime mortars as a sustainable practice for Built Heritage conservation in Mexico</td>
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**11.00-11.30  Coffee Break**
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<tr>
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<th>Topic 7.1 (Room 21)</th>
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<tr>
<td>11.30</td>
<td>Enhancing clay mortars’ properties</td>
<td>Stucco marble in the Portuguese architecture: first insights in mineralogical, physical and mechanical properties</td>
<td>Technical analysis on materials and characteristics of mortar-based compounds in Roman and Late antique Aquileia (Udine, Italy). A preliminary report of the results</td>
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<tr>
<td>11.45</td>
<td>Active photocatalytic-superhydrophobic coating with TiO₂-ZnO nano-heterostructures for lime mortars</td>
<td>Detailed studies of gypsum renders and plasters from the Ishrat Khane Mausoleum in Samarkand, Uzbekistan</td>
<td>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)</td>
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<tr>
<td>12.00</td>
<td>Evaluation of SiO₂ nanoparticles as additive for lime mortars: changes in the microstructure and mechanical properties</td>
<td>Historic gypsum mortars from Emilia Romagna (Italy). Mineralogical and petrographic analysis</td>
<td>Insights into Carolingian construction techniques – results from archaeological and mineralogical studies at Müstair Monastery, Grisons, Switzerland</td>
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<td>12.15</td>
<td>Evaluation of the influence of nano-SiO₂ and nano-Al₂O₃ in physico-mechanical properties and microstructure of calcareous clay</td>
<td>The use of stucco-marble to restore veined polished limestone. The case of the pavement in the major sacristy of the Cathedral of Seville.</td>
<td>Animal, vegetable or mineral? Characterising shell-lime, maerl-lime and limestone-lime mortar evidence from the Late Norse and Medieval site of Tuquoy, Orkney</td>
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<td>12.30</td>
<td>Studies of the mechanical properties of lime mortars treated with alkaline earth hydroxide nanoparticles</td>
<td>Thermal monitoring of a traditional gypsum oven in Ribera d’Ondara (Lleida) and simulation of the calcination process</td>
<td>Analysis of mortars from the Tarragona Roman Aqueduct as a study case to document original building and restoration materials</td>
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<td>12.45</td>
<td>Synthesis of nanolime in sugary solutions</td>
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<td>Characterisation of Roman Mortar from the Archaeological Site of Mirobriga</td>
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<td>13.00</td>
<td>The use of nanoparticles to improve the performance of restoration mortars</td>
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<td>13.15</td>
<td>Study of the role of different nanoparticles in lime pastes</td>
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13.30-15.00 Buffet Lunch
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<tr>
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<th>Topic 5.3 (Room 21)</th>
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<tbody>
<tr>
<td>15.00</td>
<td>European natural cements - their key technical properties under standardised conditions</td>
<td>Hydrophobized lime grouts prepared with microsilica and superplasticizers</td>
<td>Petrography of Historic Mortar Materials: Polarising Light Microscopy as a Method for Characterising Lime-Based Mortars</td>
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<td>15.15</td>
<td>From marlstone to rotary kilns – the early development of Portland cement</td>
<td>Self-cleaning of previously healed historic mortars with multi-functional coatings</td>
<td>Colors and grains: study on the composition and characteristics of mortars of the 18th and 19th centuries in São Luís, Maranhão – Brazil</td>
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<td>15.30</td>
<td>Drying shrinkage of historic Portland Cements: factors to be considered for successful repair</td>
<td>Use of natural zeolite aggregate in restoration lime renders</td>
<td>DB-Heritage: A database of mortars composition and characteristics</td>
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<td>15.45</td>
<td>Restoration techniques using 1930’s Portland cements at Porte de l’Est in the Roman city-wall of Aventicum, Switzerland</td>
<td>Addressing safety and durability requirements of architectural heritage by developing functional conservation mortars</td>
<td>Characterization of Lime Mortar from a Tabique Pampango Wall Technique in the Philippines</td>
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<td>16.00</td>
<td>Repairs to Historic Concrete Pavement at Jacob Riis Park Utilizing Natural, Roman and Portland Cements</td>
<td>Autogenic vs. autonomic self-healing process in conservation mortars with crystalline admixture</td>
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<td>16.15</td>
<td>The use of mortars in Palau Güell by Antoni Gaudi</td>
<td>Lime-based rendering mortars with photocatalytic and hydrophobic agents: assessment of the water repellency and biocide effect</td>
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16.30-16.45 | Gordillo’s Cal de Moron 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 (Laboratory 012) | Practical applications of putty lime: design of mortars |
## POSTERS (Hall of the Auditorium) Chair: José M. Fernández

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<tr>
<th>Time</th>
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<tbody>
<tr>
<td>18.00-18.45</td>
<td>Macroscopic high resolution techniques to the characterization of the mortars structures in the Sé-Cathedral’s archaeological complex in Idanha-a-Velha</td>
<td>T 1</td>
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<tr>
<td>18.00-18.45</td>
<td>Figural Renaissance stucco in the Czech Republic – Technological and material characterisation</td>
<td>T 3</td>
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<td>18.00-18.45</td>
<td>Fibre reinforced mortars for cultural heritage protection</td>
<td>T 4</td>
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<tr>
<td>18.00-18.45</td>
<td>Roman mortars of floor substrates and walls from Arroyo de la Dehesa de Velasco site: petrographic and mineralogical characterization</td>
<td>T 5</td>
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<tr>
<td>18.00-18.45</td>
<td>Hydraulic mortars at Caesarea: underwater and on-land pozzolanic reactions through chemical and mineralogical examinations of Herodian, Roman, and Byzantine constructions</td>
<td>T 5</td>
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<td>18.00-18.45</td>
<td>Characterization of historical mortars from the Portuguese Citadel in Ksar Seghir (Morocco)</td>
<td>T 5</td>
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<tr>
<td>18.00-18.45</td>
<td>16th century decorative elements in the Convento dos Capuchos (Serra de Sintra, Portugal)</td>
<td>T 5</td>
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<tr>
<td>18.00-18.45</td>
<td>Warm applied Mortar (WAM) – An insight into the historical technique of “Heiße Speis” and its use for renders</td>
<td>T 6</td>
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<td>18.00-18.45</td>
<td>Mortars and renders from Roman villa Horta da Torre (Portugal): a multi-analytical approach</td>
<td>T 6</td>
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<td>18.00-18.45</td>
<td>Characterization of historical mortars from the Botanic Garden of the National Palace of Queluz</td>
<td>T 7</td>
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<tr>
<td>18.00-18.45</td>
<td>Petrographic and chemical-mineralogical characterization of plaster and mortar from the Renaissance cistern at Amaiur Castle (Navarre, Spain)</td>
<td>T 7</td>
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<tr>
<td>18.00-18.45</td>
<td>Characterization of historic mortars: techniques used to establish a construction chronology. Case study: “Aragoneses mill” as it belongs to popular architectural heritage</td>
<td>T 8</td>
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<td>18.00-18.45</td>
<td>Towards an integrated approach to mortar analysis – The Pompei Arch&amp;Lab Project</td>
<td>T 10</td>
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<td>18.00-18.45</td>
<td>Practical application of lime-pozzolan mortars to damp masonry</td>
<td>T 10</td>
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<tr>
<td>18.00-18.45</td>
<td>Calcium alkoxide as an innovative product to consolidate cracks in cement mortars</td>
<td>T 11</td>
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### Topic 12.3 (Auditorium) Chair: Cristiana Nunes, Ana Velosa

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<th>Time</th>
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<tr>
<td>18.00</td>
<td>Efficiency of field test methods for evaluation of non-structural injection grouts in Slovenian conservation practice</td>
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<td>18.15</td>
<td>Evaluation of the rheological behaviour of a natural additive of vegetal origin in restoration lime mortars as an ecological and sustainable alternative</td>
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<td>18.30</td>
<td>Diethyl oxalate-based microgrouts in calcium carbonate systems: formulation, field testing and mineralogical characterisation</td>
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<tr>
<th>Time</th>
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<tbody>
<tr>
<td>20.00-23.00</td>
<td>Guided visit to the Museum University of Navarra (MUN). Gala dinner Meeting point: Esplanade at the entrance of the Museum</td>
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</table>
### Friday, 21st June

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic 12.4 (Auditorium)</th>
<th>Topic 11.2 (Amphitheatre)</th>
<th>Topic 7.2 (Room 21)</th>
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<tbody>
<tr>
<td>09.30</td>
<td>The initial reactions of lime-pozzolan pastes for conservation of masonry</td>
<td>Frost resistance of reproduced mosaic mortars</td>
<td>Analysis of mortar samples from the Church of the Saints Sergius and Bacchus at Umm as-Surab (Jordan)</td>
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<tr>
<td>09.45</td>
<td>Comparative analysis of the mechanical properties and workability of lime mortars: examples from Hungary and Cyprus</td>
<td>Black pigmentation by fungi in Romanic churches’ wall paintings in Northern Portugal (15th and 16th century). Challenges and strategies of preventive conservation in places of worship</td>
<td>Microbiological diversity of ancient architectonical structure of Wawel Royal Castle in Krakow, Poland</td>
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<td>10.00</td>
<td>Evaluation of the fresh state properties of lime-based grouts through inter-laboratory comparative testing</td>
<td>Coatings in the conservation of Built Heritage with earth in Santiago de Chile</td>
<td>Characterization and durability analysis of coral stones in a marine environment</td>
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<tr>
<td>10.15</td>
<td>Investigating differences in the performance of lime-based mortars</td>
<td>Highly transparent TiO2-SiO2 layers for cultural heritage preservation</td>
<td>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</td>
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<tr>
<td>10.30</td>
<td>Influence of the substrate on the mechanical characteristics of the applied mortars</td>
<td>The rehabilitation of the old buildings in Algeria: techniques and methods</td>
<td>Fernandina old Wall of Lisbon – Characterization towards its preservation</td>
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<tr>
<td>10.45</td>
<td>Impact of aggregates on fresh mortars’ properties</td>
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### 11.00-11.30 Coffee Break
11.30-12.30 **Topic 4.2** (Auditorium)
Chair: Ioannis Karatasios, Vassiliki Pachta
- 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

11.30 **Topic 3.2** (Amphitheatre)
Chair: Teresa Freire, Reyes Rodríguez
- 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

11.45 **Topic 9.2** (Room 21)
Chair: Mark Thacker, Farkas Pintér
- Photoactive Fe-TiO₂ 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

12.00 **SRG composite systems**
for strengthening masonry structures:
from laboratory to field applications
- Characterisation of Gypsum Renders in the Paris Region and Determination of the Traditional Fabrication Process

12.15 Buffet Lunch

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 Taşcı; 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 Kozlovcev; 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, Dais, 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.

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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; Tsouira 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 Sodré dos Santos; João Guilherme Kimura Moreira; Lucy Gomes Sant’Anna
University of São Paulo, Brazil

17.00-17.30 Coffee Break

17.30-18.30 Topic 11.1 (Room 21) Chair: Chiara Pasian & Sara Pavia

17.30 Comparative analysis of permeability values of traditional aerial lime mortars for preventive conservation
Ana González-Serrano; Esther Ontiveros-Ortega; Reyes Rodríguez-Garcia
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; Stéphanie Duchêne; Véronique Vergès-Belmin; Claire Dandrel; David Giovannacci; Witold Nowik
LRMH, Ministère de la Culture et de la Communication, Sorbonne Universités, CRC, USR 3224, Muséum 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

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**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 Žižlavský; 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, I CEA, 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 Máčová  
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 Batllo House of Gaudi 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 Hemeda*  
Institute of Geosciences (CSIC-UCM), Spain; Suez University, Egypt; Ecole Normale Supérieure, AOROC, France; Cairo University, Egypt

10.30  Sampling cataloging methodology procedures for the conservation of historical colours in urban landscapes  
*Isolina Díaz-Ramos; Jorge Manzano Cabrera*  
University of Las Palmas de Gran Canaria, Spain

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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 19th C 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 Garbini; 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. Küberle; M. Zötzl; A. Fenzke; H. Siedel
TU Dresden, Institut für Diagnostik und Konservierung an Denkmalen 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 Speciale; 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
Maria del Mar Barbero-Barrera; Aranzazu Sierra Fernández; Duygu Ergenci; 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 Martinez-Ramírez; Laura R. Higuerauela; 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 Palacia; Marc Tous Coll; Bryan Rivas Guevara; Felipe Buill Pozuelo; Judith Ramírez Casas
EPSEB-Universitat Politècnica de Catalunya, Barcelona, Spain
Thursday, 20th June 2019

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

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| 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 Sârl, 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 Sem Hao Chua; Paula Cristina Gonçalves Pereira Galacho; Patricia Sofia Martins Moita; José Carlos Quaresma*  
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**

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| 15.00 | European natural cements - their key technical properties under standardised conditions  
David Hughes; Johannes Weber; Vincenzo Starini; 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 Gaudi  
Ricardo Gómez-Val; Judith Ramírez-Casas; Antonia Navarro Ezquerra  
Universitat Politècnica de Catalunya, Barcelona, Spain |

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

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| 15.00 | Hydrophobized lime grouts prepared with microsilica and superplasticizers  
Jesús Fidel González-Sánchez; Burcu Taşçı; 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 Hirsenberger; John Milan van der Bergh; Snezana Vucetic  
University of Novi Sad, Technical high school "Mileva Marie-Ajnostajn", Novi Sad, Serbia |
15.30 Use of natural zeolite aggregate in restoration lime renders
*Martin Vyšvářil; Patrik Bayer; Tomáš Žižlavský; 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 Lime-based rendering mortars with photocatalytic and hydrophobic agents: assessment of the water repellency and biocide effect
*Jesús Fidel González-Sánchez; Guillermo Martínez de Tejada; José M. Fernández; Íñigo Navarro-Blasco; José I. Alvarez*
University of Navarra, Pamplona, Spain

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

*Thursday, 20th June 2019*
16.30-16.45  Gordillo’s Cal de Moron 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 (Lab 012)
Practical applications of putty lime: design of mortars

18.00-18.45  POSTERS (Hall of the Auditorium)

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. Krajíček; D. Všianský; P. Majoroš
University of Pardubice, Litomysl, Masaryk University, Brno, Technische Universität Dresden, Dresden, Czech Republic

T 4  Fibre reinforced mortars for cultural heritage protection
Miloš Drdácký; 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, María 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-Boudjaj; António Candeias
HERCULES, University of Évora, Universidade Nova de Lisboa, Portugal, Direction Générale du Patrimoine, Morocco

Thursday, 20th June 2019
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; Patricia 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; Edith 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 Škapan; 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  
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  

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**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
*Akos 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 Valek; 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**  Black pigmentation by fungi in Romanic churches’ wall paintings in Northern Portugal (15th and 16th century). Challenges and strategies of preventive conservation in places of worship
*Alexandra Marco; Eduarda Vieira; Manuela Pintado; Patricia R. Moreira*
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
*Patricia Marchante; Pilar Silva; Ana Velosa; Sara Moutinho*
Tierractual, Chile, Universidade de Aveiro, Portugal
**10.15** Highly transparent TiO$_2$-SiO$_2$ layers for cultural heritage preservation  
*Sylwia Svorová Pawelkowicz; Petr Svora; Zdeněk Prošek; Michaela Jakubičková; Jan Šubrt*  
Czech Academy of Sciences, Technical University in Prague, Technical University of Liberec, Czech Republic

**10.30** The rehabilitation of the old buildings in Algeria: techniques and methods  
*Nesrine Meddour; Boualem Djebri*  
Ecole Polytechnique d’architecture et d’urbanisme, EPAU, Algiers, Algeria

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**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 architectonical structure of Wawel Royal Castle in Krakow, Poland  
*Magdalena Dyda; Adam Pyzik; Ewa Wilkojc; Beata Kwiatkowska-Kopka; Aleksandra Sklodowska*  
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-Ziecina; Karolina Szlek; Stawomir 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

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**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 Klikoglou; 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 Xekoukoulatakis; Nikolaos Kalithrakas-Kontos; Noni Maravelaki  
Technical University of Crete, Chania, Crete, Greece

**12.15** SRG composite systems for strengthening masonry structures: from laboratory to field applications  
Paolo Casadei; Paolo Girardello  
Strengthening Division, Kerakoll Spa, Sassuolo (MO), Italy

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### 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 Albarracin 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-Lapeyrusse; 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 Ezquerra; 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
Disposition of Rooms and Facilities at the Venue of HMC 2019

**FIRST FLOOR**

- LIFT
- ROOM 21
- UPSTAIRS STAIRS LEADING TO THE FIRST FLOOR (ROOM 10 AND 21)
- TOILETS
- MAIN AUDITORIUM
- LAB. 012 - WORKSHOP
- POSTERS AREA
- SPONSORS AREA
- SECRETAIRAT HMC 2019
- AMPHITHEATRE ROOM 10
- GREEN SPACE
- COFFEE BREAK – LUNCH AREA
- TOILETS
- MAIN ENTRANCE
- Corridor leading to the ground floor and main auditorium
- Photographic exhibition, Cal de Morón Museum

**GROUND FLOOR**

- LIFT
- STAIRS LEADING TO THE FIRST FLOOR (ROOM 10 AND 21)
- MAIN AUDITORIUM
- TOILETS
- MAIN ENTRANCE
- POSTERS AREA
- SPONSORS AREA
- GREEN SPACE
- COFFEE BREAK – LUNCH AREA