5th Historic Mortars Conference

HMC 2019

Programme

University of Navarra, Pamplona

19th – 21st June, 2019

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<td>09.00-11.00 T 11.2 Main auditorium</td>
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<td><strong>09.30-11.00</strong></td>
<td>Inaugural Conference</td>
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<td><strong>11.00-11.30</strong></td>
<td>Coffee Break</td>
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<td>13.30-15.00 Lunch</td>
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<td><strong>15.00-17.00</strong></td>
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<td>15.00-15.30 Bus to Olite</td>
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<td><strong>17.00-17.30</strong></td>
<td>Coffee Break</td>
<td>17.00-17.30 Coffee Break / Poster Tour</td>
<td>15.30-17.30 Visit to the Castle of the Kings of Navarra and Church of S. María (XIIIth C.) in Olite</td>
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<tr>
<td><strong>17.30-18.00</strong></td>
<td>Workshop &amp; Exhibition</td>
<td>17.30-18.00</td>
<td>15.30-17.30 Visit to the Laboratory of the Chemistry of Science</td>
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<tr>
<td><strong>17.30-18.30</strong></td>
<td>Registration</td>
<td><strong>Lunch</strong></td>
<td><strong>Bus to Otazu</strong></td>
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<td><strong>17.30-18.30</strong></td>
<td>Hall of Science Library building</td>
<td><strong>18.00-19.00 T 6.2 Main auditorium T 12.3 Amphitheatre Room 10 POSTERS Room 21</strong></td>
<td><strong>18.00-21.30 Visit to the Otazu Manor and the Bodega Otazu winery. Cocktail dinner</strong></td>
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<td><strong>19.30-20.30</strong></td>
<td>Technical visit: Cloister of the Cathedral of Pamplona</td>
<td><strong>20.00-23.00 Guided visit to the Museum of the University of Navarra. Gala dinner</strong></td>
<td><strong>21.30-22.00 Bus to Pamplona</strong></td>
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*Note: T stands for Time.*
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<tr>
<th>T 1</th>
<th>Topic 1:</th>
<th>Earth-based plasters and mortars on archaeology and historic constructions</th>
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<tr>
<td>T 2</td>
<td>Topic 2:</td>
<td>Use of nanotechnology for high performance mortars</td>
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<td>T 3</td>
<td>Topic 3:</td>
<td>Gypsum-based plasters and mortars in historical constructions</td>
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<td>T 4</td>
<td>Topic 4:</td>
<td>Functional mortars for the conservation of historic and modern cultural heritage structures</td>
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<tr>
<td>T 5</td>
<td>Topic 5:</td>
<td>Characterization of historic mortars and masonry structures. Sampling and test methods</td>
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<tr>
<td>T 6</td>
<td>Topic 6:</td>
<td>Historic production, processing and application of mortars, renders and grouts. Lime technologies</td>
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<tr>
<td>T 7</td>
<td>Topic 7:</td>
<td>Mortars in archaeological sites. Construction history. Archaeometry</td>
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<tr>
<td>T 8</td>
<td>Topic 8:</td>
<td>Dating of historic mortars</td>
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<td>T 9</td>
<td>Topic 9:</td>
<td>Natural and Roman cement mortars</td>
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<tr>
<td>T 10</td>
<td>Topic 10:</td>
<td>Conservation issues concerning mortars, plasters, renders and grouts. Diagnosis. Decay and damage mechanisms. Case studies</td>
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**Wednesday, 19th June**

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

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

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

Prof. Antonia Moropoulou et al.
National Technical University of Athens, Greece

**11.00-11.30 Coffee Break**

**11.30-13.30**

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<thead>
<tr>
<th>Time</th>
<th>Topic 5.1 (Auditorium)</th>
<th>Topic 10 (Amphitheatre)</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>
<td>Medieval mortars and masonry in Hamar bishopric Norway: research, conservation and authenticity</td>
</tr>
<tr>
<td>11.45</td>
<td>Aggregates of Roman plaster (Lombardy, Italy): calcite powder of quartz powder?</td>
<td>Evolution of mortars composition and characteristics during the 20th century–Study of Portuguese buildings awarded with Architecture Valmor Prize</td>
</tr>
<tr>
<td>12.00</td>
<td>Characterisation techniques for lime based materials – a case study of the Rajagopuram of Pundarikaksha temple in Tamil Nadu, India</td>
<td>Petrographic characterization of lime mortars of the bisonto-Roman ruins, case study of the antique Bône city, Algeria.</td>
</tr>
<tr>
<td>12.15</td>
<td>Characterisation of concrete structures along the Reschen frontier, South Tyrol, Italy</td>
<td>The Restoration of the church of Our Lady of the Assumption Dausi, Bohol, Philippines</td>
</tr>
<tr>
<td>12.30</td>
<td>Study of the conservation state and building materials of the defensive constructions of Southeast Spain: the example of Mula’s castle</td>
<td>The analysis of the proportion of mortar for Japanese roof tile (Ibushikawara) in Taiwan by applying of Taguchi Method</td>
</tr>
<tr>
<td>12.45</td>
<td>Chemical, mineralogical and hydraulic characteristics of Roman mortars in</td>
<td>Characterization of mortar samples from York Minster (York, UK)</td>
</tr>
<tr>
<td>13.00</td>
<td>Provenance study of raw materials used for lime making at Prague Castle during Medieval times</td>
<td>Digital image analysis as basic for the evaluation of mortars in architectural conservation</td>
</tr>
<tr>
<td>13.15</td>
<td>Interpretation of scientific data derived from analytical techniques used in the characterisation of Roman</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>
<th>Time</th>
<th>Topic 12.1 (Auditorium)</th>
<th>Topic 1 (Amphitheatre)</th>
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<tbody>
<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)</td>
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<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</td>
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<td>15.45</td>
<td>The impact of elevated temperatures at the properties of lime-based</td>
<td>Earth-based plasters: the influence of clay mineralogy</td>
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<tr>
<td>16.00</td>
<td>Evaluation of resistance to salts of lime mortars produced with mineral</td>
<td>Earth-based and binder-based mortars comparison</td>
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<tr>
<td>16.15</td>
<td>A grout and mortar system for fine cracks and shallow surfaces fills in marble</td>
<td>Earth-based and current plasters: assessment of efficiency and contribution to indoor air quality</td>
</tr>
<tr>
<td>16.30</td>
<td>An innovative way for testing adhesion of non-structural injection grouts for the stabilisation of historic plasters</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></td>
<td>Rescuing the manufacturing process of traditional mortars present on XIX-century earthen buildings in Brazil</td>
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**17.00-17.30 Coffee Break**

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<th>Time</th>
<th>Topic 11.1 (Auditorium)</th>
<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</td>
</tr>
<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>
</tr>
<tr>
<td>18.00</td>
<td>Preliminary results on the use of ammonium phosphate solutions for the consolidation of lime-based</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>The rehabilitation of the old buildings in Algeria: techniques and methods</td>
<td>Characterization and Radiocarbon dating of complex mortars in Historic Buildings</td>
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**19.30-20.30 Visit to the restoration of the Cloister of the Cathedral of Pamplona**
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<th>Topic 6.1 (Room 21)</th>
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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 methodology procedures for the conservation of historical colours in urban landscapes</td>
<td>Marmorite - A tradicional wall-coating technique</td>
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<tr>
<td>09.30</td>
<td>Evaluation of the fresh state properties of lime-based grouts through inter-laboratory comparative testing</td>
<td>Analytical and chromatic characterization of the interior walls finishes in the Batlló House of Gaudí in Barcelona. A surprising discovery</td>
<td>Ancient mortars, Modern Times discussions and Today’s conservation</td>
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<tr>
<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>Preliminary research on potential raw material sources for dolomitic lime mortars at St John convent at</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>Characterization of the Roman mortars of the pool of Guelma</td>
<td>Pozzolanicity beyond Vitruvius: insights into the exploitation of reactive silicates throughout the Roman world</td>
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<tr>
<td>10.15</td>
<td>Microstructure of lime pastes with the addition of vegetable oils</td>
<td>Technological characterization of the mortars of House of Rui Barbosa Museum facades</td>
<td>Composition and Technology of the 17th Century Stucco Decorations at Červená Lhota Castle in</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>Algarve vernacular architecture facade ornaments: chemical, physical and mechanical characterization</td>
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<tr>
<td>10.45</td>
<td>NHL-based plasters and renders – Assessing the influence of mixing method on workability and hardened mortar properties</td>
<td>Medieval mortar, stone and repair mortar of an abandoned Medieval Church, compatibility issues: example from Hungary</td>
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**11.00-11.30 Coffee Break**
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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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<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</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>
<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>
<td>Fernandina old Wall of Lisbon – Characterization towards its preservation</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>
<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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<tr>
<td>15.30</td>
<td>Drying Shrinkage of Historic Portland Cements: Factors to be Considered for Successful 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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<tr>
<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>Prototyping an Early Modern Mortar Database for the American South</td>
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<tr>
<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>
<td>Roman, medieval and modern mortars in the Walloon Region (Belgium). Results and perspectives.</td>
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<tr>
<td>16.15</td>
<td>The use of mortars in Palau Guell by Antoni Gaudi</td>
<td>Lime-based rendering mortars with photocatalytic and hydrophobic agents: assessment of the water repellency and biocide effect</td>
<td>Characterization of Lime Mortar from a Tabique Pampango Wall Technique in the Philippines</td>
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<tr>
<td>16.30</td>
<td>Methodology of identification of natural and historic Portland cements. Application and study in mortars of Madrid and Barcelona</td>
<td>SRG composite systems for strengthening masonry structures: from laboratory to field applications</td>
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**16.45-17.00 Technical Presentation by SINT Technology (Room 21): Drilling Resistance Measurement System, DRMS**

**17.00-17.30 Coffee Break & Poster Tour**

**17.30-18.00 Workshop by Gordillo's Cal de Morón (Lab 012) Practical applications of putty lime: design of mortars**
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<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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<td>Figural Renaissance stucco in the Czech Republic – Technological and material characterisation</td>
<td>T 3</td>
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<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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<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>Characterization of historical mortars from the Portuguese Citadel in Ksar Seghir (Morocco)</td>
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<td>16th century decorative elements in the Convento dos Capuchos (Serra de Sintra, Portugal)</td>
<td>T 5</td>
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<td>Warm applied Mortar (WAM) – A research into the historical technique of “Heiße Speis” and its use for plasters</td>
<td>T 6</td>
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<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>Characterization of historical mortars from the Botanic Garden of the National Palace of Queluz</td>
<td>T 7</td>
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<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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<td></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>Towards an integrated approach to mortar analysis - The Pompei Arch&amp;Lab Project</td>
<td>T 10</td>
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<td>Practical application of lime-pozzolan mortars to damp masonry</td>
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<td>Calcium alkoxide as an innovative product to consolidate cracks in cement mortars</td>
<td>T 11</td>
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<tr>
<th>18.00-19.00</th>
<th>Topic 6.2 (Auditorium) Chair: Íñigo Navarro, Mark Thacker</th>
<th>Topic 12.3 (Amphitheatre) Chair: Cristiana Nunes, Ana Velosa</th>
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<tbody>
<tr>
<td>18.00</td>
<td>Hot applied lime mortar – assessment of a traditional technique used in modern restoration</td>
<td>Reproducibility and efficiency of field test methods for evaluation of non-structural injection grouts</td>
</tr>
<tr>
<td>18.15</td>
<td>Stucco techniques in the vernacular architecture of the Algarve (18-20th Centuries)</td>
<td>Influence of adding of natural cement on the characteristics of air lime mortars composition</td>
</tr>
<tr>
<td>18.30</td>
<td>Stucco ornaments and colour in architectural surfaces of southern Portugal</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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<tr>
<td>18.45</td>
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<td>Diethyl oxalate-based microgrouts in calcium carbonate systems: formulation, field testing and mineralogical characterisation</td>
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| 20.00-23.00 | Guided visit to the MUN. Gala dinner |

*Thursday, 20th June 2019*
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<th>Time</th>
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<th>Topic 12.4 (Amphitheatre)</th>
<th>Topic 7.2 (Room 21)</th>
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<tbody>
<tr>
<td>09.00</td>
<td>The effect of crushed brick to the behavior of air lime mortars composition</td>
<td>The early reactions of pozzolanic-lime pastes for conservation of masonry</td>
<td>Analysis of mortar samples from the Church of the Saints Sergius and Bacchus at Umm as-Surab (Jordan)</td>
</tr>
<tr>
<td>09.15</td>
<td>The effect of metakaolin on the properties of air lime mortar composition</td>
<td>Comparative analysis of the mechanical properties and workability of lime mortars: examples from Hungary and Cyprus</td>
<td>Characterization of Historic Mortar Samples for Period Analysis and Determination of Intervention Mortars: A Case Study</td>
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<tr>
<td>09.30</td>
<td>Frost resistance of reproduced mosaic mortars</td>
<td>Hydraulic-lime-limestone repair mortars for historic and traditional fabrics</td>
<td>Microbiological diversity of ancient architectonical structure of Wawel Royal Castle in Krakow, Poland</td>
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<tr>
<td>09.45</td>
<td>Rehabilitation of the old buildings in Algeria: techniques and methods</td>
<td>Investigating differences in the performance of lime-based mortars</td>
<td>Characterization of historic mortars from Jerash Archaeological Site in Jordan</td>
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<tr>
<td>10.00</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>Influence of the substrate on the mechanical characteristics of the applied mortars</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>
</tr>
<tr>
<td>10.15</td>
<td>Coatings in the conservation of built heritage with earth in Santiago de Chile</td>
<td>Impact of aggregates on fresh mortars’ properties</td>
<td>Characterization and durability analysis of coral stones in a marine environment</td>
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<tr>
<td>10.30</td>
<td>Highly transparent TiO\textsubscript{2}-SiO\textsubscript{2} layers for cultural heritage preservation</td>
<td>Formulated lime mortars as a sustainable practice for Built Heritage conservation in Mexico</td>
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<td>10.45</td>
<td>Integration of Historic Districts in Modern Cities within Sustainable Perspectives</td>
<td>Comparing the moisture permeability of limecrete and concrete floor slabs</td>
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**Friday, 21st June**

**11.00-11.30 Coffee Break**
13.00-13.30  Closing session (Auditorium)

13.30-15.00  Buffet Lunch

15.00-22.00  Complimentary cultural activities

15.00  Bus to Olite
   From the surface parking in front of the School of Sciences

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)

Wednesday, 19th June

09.00-09.30 Opening Session (Auditorium)

09.30-11.00 Inaugural Conference (Auditorium)

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

Prof. Antonia Moropoulou et al.
National Technical University of Athens, Greece

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 Aggregates of Roman plaster (Lombardy, Italy): calcite powder of quartz powder?

Roberto Bugini; Luisa Folli
Istituto CNR Conservazione Beni Culturali, Milano, Italy

12.00 Characterisation techniques 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 Study of the conservation state and building materials of the defensive constructions of Southeast Spain: the example of Mula’s castle in Murcia

Lourdes Gutiérrez-Carrillo; Anna Arizzi; Isabel Bestué-Cardiel; Eduardo Sebastián Pardo
University of Granada, Spain

12.45 Chemical, mineralogical and hydraulic characteristics of Roman mortars in Turkey

Burcu Taşçı; Hasan Böke
Izmir Institute of Technology, Turkey
13.00 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

13.15 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

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

11.30 Medieval mortars and masonry in Hamar bishopric Norway: research, conservation and authenticity
Kristian Reinfjord
Anno Museum, Norway

11.45 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

12.00 Petrographic characterization of lime mortars of the bisonto-Roman ruins; case study of the antique Bône city, Algeria.
Gheris Abderrahim
University of Souk Ahras, Algeria

12.15 The Restoration of the church of Our Lady of the Assumption Dauis, Bohol, Philippines
Jim Franklin O. Kalaw; Raul Y. Naguit Jr.
National Historical Commission of the Philippines

12.30 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

12.45 Characterization of mortar samples from York Minster (York, UK)
Cecilia Pesce; Alison Henry; Giovanni Pesce; John David
Northumbria University; Historic England, Swindon; York Minster, York, UK

13.00 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,

13.15 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

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<th>Time</th>
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<th>Authors</th>
<th>Institution</th>
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<tbody>
<tr>
<td>15.00</td>
<td>Characterization and compatibility assessment of commercial stone repair mortars</td>
<td>B. Lubelli; T.G. Nijland; R.P.J. van Hees</td>
<td>Delft University of Technology, TNO, Delft, The Netherlands</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>Michael P. Edison, Chad Lausberg</td>
<td>Edison Coatings, Inc., CT, U.S.A.</td>
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<tr>
<td>15.30</td>
<td>Use of ultrafine mafic rocks for the enhancement of carbonation reaction in lime renders</td>
<td>Loucas Kyriakou; Ioannis Rigopoulos; Ioannis Ioannou</td>
<td>University of Cyprus, Cyprus</td>
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<tr>
<td>15.45</td>
<td>The impact of elevated temperatures at the properties of lime-based mortars</td>
<td>Vasiliki Pachta; Sofia Triantafyllaki; Maria Stefanidou</td>
<td>Aristotle University of Thessaloniki, Thessaloniki, Greece</td>
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<tr>
<td>16.00</td>
<td>Evaluation of resistance to salts of lime mortars produced with mineral additions</td>
<td>Ana C. Magalhães; Rosana Muñoz</td>
<td>Universidade Federal da Bahia, Brazil</td>
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<tr>
<td>16.15</td>
<td>A grout and mortar system for fine cracks and shallow surfaces fills in marble</td>
<td>Andrew Thorn</td>
<td>Artecare, Melbourne, Australia</td>
</tr>
<tr>
<td>16.30</td>
<td>An innovative way for testing adhesion of non-structural injection grouts for the stabilisation of historic plasters</td>
<td>Chiara Pasian; Francesca Piqué; Albert Jornet</td>
<td>University of Malta, Malta; IMC, SUPSI, Lugano, Switzerland</td>
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### 15.00-17.00  Topic 1  (Amphitheatre) chair: Paulina Faria & Noni-Pagona Maravelaki

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<tr>
<td>15.00</td>
<td>Earth-based plasters – the effect of anhydrite stabilization</td>
<td>José Lima; Afonso Lino; Teresa Freire; Isabel Pombo; Paulina Faria</td>
<td>University of Lisbon, CERIS, FCT, NOVA University of Lisbon, LNEC, Lisbon, Portugal</td>
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<tr>
<td>15.15</td>
<td>Similar appearance of mortar and brick masses in Algiers Casbah houses during the Ottoman period (16th- early 18th centuries)</td>
<td>Semha Bernou; Tsouira Kassab; Rosa Bustamante; Francisco Fernández</td>
<td>Polytechnic School of Architecture and Urbanism (EPAU-Algiers), UPM, Madrid, Spain</td>
</tr>
<tr>
<td>15.30</td>
<td>Assessment of adhesive strength of an earth plaster on different substrates through different methods</td>
<td>Paulina Faria; José Lima; João Nabais</td>
<td>CERIS, FCT, NOVA University of Lisbon, Portugal</td>
</tr>
</tbody>
</table>
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 Pavía

17.30 Comparative analysis of permeability values of traditional aerial lime mortars for preventive conservation
Ana González-Serrano; Esther Ontiveros-Ortega; Reyes Rodríguez-García
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 Duchène; 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

18.15 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
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

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*University of de Navarra, 19th - 21st June 2019  5th Historic Mortars Conference*

*Wednesday, 19th June 2019*
### Thursday, 20th June

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<tr>
<th>Time</th>
<th>Topic 12.2 (Auditorium)</th>
<th>Chair: Paulina Faria &amp; Véronique Vergès-Belmin</th>
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</thead>
</table>
| 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  | 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 |
| 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  | 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 |
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<th>Topic</th>
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<tr>
<td>09.00</td>
<td>Topic 5.2 (Amphitheatre)</td>
<td>Rosário Veiga &amp; Johannes Weber</td>
<td>Roman vs. medieval crushed brick lime mortars: A comparative study</td>
<td>Martin Schidlowski; Tobias Bader; Anja Diekamp, University of Innsbruck, Austria</td>
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<td>09.15</td>
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<td>Sampling methodology procedures for the conservation of historical colours in urban landscapes</td>
<td>Isolina Díaz-Ramos; Jorge Manzano Cabrera, University of Las Palmas de Gran Canaria, Spain</td>
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<td>09.30</td>
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<td>Analytical and chromatic characterization of the interior walls finishes in the Batlló House of Gaudí in Barcelona. A surprising discovery</td>
<td>Àgueda Serra; Joan Casadevall, Gabinet del Color S.L., Barcelona, Spain</td>
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<td>09.45</td>
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<td>Mineralogical characterization of historical cement-based mortar from Rupnik military fortification line</td>
<td>Petra Štukovnik; Janez Peter Grom; Marjan Marinšek; Violeta Bokan Bosiljkov, University of Ljubljana, Slovenia</td>
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<td>10.00</td>
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<td>Characterization of the Roman mortars of the pool of Guelma</td>
<td>Belaidi Mourad; Hamiane Messaoud; Brahmi Abla; Bouzetine Kamel, URMPE / University of Boumerdes, Boumerdes, Algeria, National School of Conservation and Restoration of Cultural Property, Algiers, Algeria</td>
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<td>10.15</td>
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<td>Technological characterization of the mortars of House of Rui Barbosa Museum facades</td>
<td>Claudia S. Rodrigues de Carvalho, House of Rui Barbosa Foundation, Ministry of Culture, Brazil</td>
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<td>10.30</td>
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<td>Algarve vernacular architecture facade ornaments: chemical, physical and mechanical characterization</td>
<td>Marta Santos; António Santos Silva; Rosário Veiga, University of Lisbon, National Laboratory for Civil Engineering (LNEC), Lisbon, Portugal</td>
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<td>10.45</td>
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<td>Medieval mortar, stone and repair mortar of an abandoned Medieval Church, compatibility issues: example from Hungary</td>
<td>Zsuzsanna Kósa; Ákos Török, Budapest University of Technology and Economics, Hungary</td>
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<tr>
<th>Time</th>
<th>Topic 6.1 (Room 21)</th>
<th>Albert Jornet &amp; Mar Barbero</th>
<th>Title</th>
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<tr>
<td>09.00</td>
<td>Blast furnace slag in historic mortars from Bergslagen, Sweden</td>
<td>Jan Erik Lindqvist; Kristin Balksten; Birgit Fredrich</td>
<td>RISe CBI, Uppsala University, Sweden</td>
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<tr>
<td>09.15</td>
<td>Marmorite - A tradicional wall-coating technique</td>
<td>Maria de Lurdes Belgas da Costa Reis; Fernando José Garrido Branco; Jorge Morarji R. Dias Mascarenhas</td>
<td>Polytechnic Institute of Tomar, University of Coimbra, Portugal</td>
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</table>
09.30 Ancient mortars, Modern Times discussions and Today’s conservation  
*Lucie Fusade*  
University of Oxford, U.K.

09.45 Preliminary research on potential raw material sources for dolomitic lime mortars at St John convent at Münstair, Switzerland  
Giovanni Cavallo; Marta Caroselli; Albert Jornet; Patrick Cassitti  
SUPSI, Lugano, Stiftung Pro Kloster St.-Johann, Switzerland

10.00 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

10.15 Composition and Technology of the 17th Century Stucco Decorations at Červená Lhota Castle in the Southern Bohemia  
*Jan Válek; Olga Skružná; Petr Kozlovec; Dita Frankeová; Petra Mácová; Alberto Viani; Ivana Kumpová*  
The Czech Academy of Sciences, Czech Republic

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 TiO$_2$-ZnO nano-heterostructures for lime mortars  
*A. Speciale; J.F. González-Sánchez; I. Navarro-Blasco; J.M. Fernández; J.I. Alvarez*  
University of Navarra, Pamplona, Spain

12.00 Evaluation of SiO$_2$ nanoparticles as additive for lime mortars: changes in the microstructure and mechanical properties  
*Maria del Mar Barbero-Barrera; Aranzazu Sierra Fernández; Duygu Ergenc; Luz Stella Gómez Villalba; Rafael Fort*  
UPM, IGE (CSIC-UCM), Madrid, Spain

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  
*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-Ramirez; Laura R. Higuereula; Ignacio Cascales; Moises Martin-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 Menendez; Dita Frankeova; Jose Diaz; Radek Sevcik; Petra Macova; Mouna Faiz; Zuzana Slikova
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 Gonzalez 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; Belen Gonzalez Sanchez; Manuel Julia i Macias; Ana Maria Lacasta Palacio; Marc Tous Coll; Bryan Rivas Guevara; Felipe Buil Pozuelo; Judith Ramirez 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

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 (Arigotetas, 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 Cavollo; 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; Patricia Sofia Martins Moita; José Carlos Quaresma
Laboratório HERCULES / Universidade de Évora, Universidade Nova de Lisboa, Portugal

13.00  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

13.30-15.00  Buffet Lunch
15.00-17.00  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 Guell by Antoni Gaudi

Ricardo Gómez-Val; Judith Ramírez-Casas; Antonia Navarro Ezquerra

Universitat Politècnica de Catalunya, Barcelona, Spain

16.30  Methodology of identification of natural and historic Portland cements. Application and study in mortars of Madrid and Barcelona

Cristina Mayo Corrochano; David Sanz Arouz; Judith Ramírez Casas; Juan Ramón Rosell Amigó

ETSAM-UPM, Madrid; UPC, Barcelona, Spain

15.00-17.00  Topic 4.1 (Amphitheatre) chair: Ioannis Karatasios & Rafael Sirera

15.00  Hydrophobized lime grouts prepared with microsilica and superplasticizers

J.F. González-Sánchez; I. Navarro-Blasco; J.M. Fernández; A. Duran; R. Sirera; J.I. Alvarez

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 Maric-Ajnstajn", Novi Sad, Serbia
15.30  Use of natural zeolite aggregate in restoration lime renders
Martin Vysvařil; 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. Katsoiatis; 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
J.F. González-Sánchez; G. Martínez de Tejada; J.M. Fernández; J. Navarro-Blasco; J.I. Alvarez
University of Navarra, Pamplona, Spain

16.30  SRG composite systems for strengthening masonry structures: from laboratory to field applications
Paolo Casadei; Paolo Girardello
Strengthening Division, Kerakoll Spa, Sassuolo (MO), Italy
16.00  Roman, medieval and modern mortars in the Walloon Region (Belgium). Results and perspectives  
*Marië Demelenne; Fabrice Dagrain; Laurent Van Parys; Roald Hayen; Dominique Bossiroy*

Royal Museum of Mariemont, Morlanwelz, University of Mons, Royal Institute for Artistical Heritage (KIK-IRPA), ISSeP, Belgium

16.15  Characterization of Lime Mortar from a Tabique Pampango Wall Technique in the Philippines  
*Jan-Michael C. Cayme*

De La Salle University, Manila, Philippines

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

17.00-17.30  Coffee Break & Poster Tour

17.30-18.00  Workshop by Gordillo’s Cal de Morón (Lab 012)  
Practical applications of putty lime: design of mortars

18.00-19.00  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. Majoraš*  
University of Pardubice, Litomyšl, 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, Mª 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-Boudjây; 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
ETSAM, ETSE, Universidad Politécnica de Madrid, 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
Calcium alkoxide as an innovative product to consolidate cracks in cement mortars

Martina Zuena; Enrico Garbin; Gilberto Artioli; Matteo Panizza; Luca Nodari; Patrizia Tomasini
CNR, CIRCe, University of Padova, Padova, Italy

18.00-19.00 Topic 6.2 (Auditorium) Chair: Íñigo Navarro & Mark Thacker

18.00 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

18.15 Stucco techniques in the vernacular architecture of the Algarve (18-20th Centuries)
Marta Santos; João Pernão; José Aguiar
University of Lisbon, Portugal

18.30 Stucco ornaments and colour in architectural surfaces of southern Portugal
Marta Santos; João Pernão; José Aguiar
University of Lisbon, Portugal

18.00-19.00 Topic 12.3 (Amphitheatre) Chair: Cristiana Nunes & Ana Velosa

18.00 Reproducibility and efficiency of field test methods for evaluation of non-structural injection grouts
Andreja Padovnik; Violeta Bokan-Bosiljkov
University of Ljubljana, Slovenia

18.15 Influence of adding of natural cement on the characteristics of air lime mortars composition
Belaidi Mourad; Hamiane Messaoud; Brahmi Abla; Bouzetine Kamel
URMPE/University of Boumerdes, Boumerdes, National School of Conservation and Restoration of Cultural Property, Algiers, Algeria

18.30 Evaluation of the rheological behaviour of a natural additive of vegetal origin in restoration lime mortars as an ecological and sustainable alternative
M. T. Doménech-Carbó; J.L. Prada; X. Mas i Barberò; M. P. de Luxán Gómez del Campillo
LNEC, Lisbon, Portugal, IRP-UPV, València, ESCRBCC, Barcelona, Catalonia, IETcc-CSIC, Madrid, Spain

18.45 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 MUN. Gala dinner

Thursday, 20th June 2019
Friday, 21st June

**09.00-11.00 Topic 11.2 (Auditorium) Chair: Violeta Bokan-Bosiljkov & Ana González-Serrano**

**09.00** The effect of crushed brick to the behavior of air lime mortars composition  
*Hamiane Messaoud; Belaidi Mourad; Bouzetine Kamel; Brahmi Abla*  
URMPE / University of Boumerdes, Boumerdes, National School of Conservation and Restoration of Cultural Property, Algiers, Algeria

**09.15** The effect of metakaolin on the properties of air lime mortar composition  
*Belaidi Mourad; Hamiane Messaoud; Bouzetine Kamel; Brahmi Abla*  
URMPE / University of Boumerdes, Boumerdes, National School of Conservation and Restoration of Cultural Property, Algiers, Algeria

**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** Rehabilitation of the old buildings in Algeria: techniques and methods  
*Nesrine Meddour; Boualem Djibril*  
Ecole Polytechnique d'Architecture et d'Urbanisme EPAU, Oued Smar, Algeria

**10.00** 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; Patrícia R. Moreira*  
School of Arts, CITAR, CBQF, Portuguese Catholic University, Oporto, Portugal

**10.15** 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

**10.30** Highly transparent TiO$_2$-SiO$_2$ layers for cultural heritage preservation  
*Sylwia Svorová Pawelkowicz; Petr Svora; Jan Šubrt*  
Czech Academy of Sciences, Technical University in Prague, Czech Republic

**10.45** Integration of Historic Districts in Modern Cities within Sustainable Perspectives  
*Kabila Faris Hmood; Maha Salman*  
Al-Zaytoonah University, Amman, Jordan, Academy of Design at Rcc/Yorkville University. Mississauga, Ontario, Canada
09.00-11.00  Topic 12.4 (Amphitheatre) Chair: Cristina Galacho & Esther Ontiveros

09.00  The Early Reactions of Pozzolanic-lime Pastes for Conservation of Masonry

   Tugce Busra Su; Richard J Ball; Juliana Calabria Holley
   University of Bath, U.K.

09.15  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

09.30  Hydraulic-lime-limestone repair mortars for historic and traditional fabrics

   M. Aly; S. Pavia
   Trinity College Dublin, Ireland

09.45  Investigating differences in the performance of lime-based mortars

   Ioanna Papayianni; Vasiliki Pachta; Emmanuela Berberidou; Maria Kalogirotou
   Aristotle University of Thessaloniki, Thessaloniki, Greece

10.00  Influence of the substrate on the mechanical characteristics of the applied mortars

   Isabel Torres; Inês Flores Colen; Rafael Travincas; Dora Silveira
   University of Coimbra / ADAI / LAETA, Association for the Development of Industrial Aerodynamics / ITeCons, CERIS, DECivil, IST, University of Lisbon, Portugal

10.15  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

10.30  Formulated lime mortars as a sustainable practice for Built Heritage conservation in Mexico

   Marlene Sámano Chong
   National Institute of Anthropology and History. México

10.45  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.

09.00-11.00  Topic 7.2 (Room 21) Caspar Groot & Duygu Ergenç

09.00  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.

09.15  Characterization of Historic Mortar Samples for Period Analysis and Determination of Intervention Mortars: A Case Study

   Ece Erdogmus; Mine Turan; Joshua Freedland; Michael Hoff; Rhys Townsend
   University of Nebraska-Lincoln, Lincoln, NE, U.S.A.
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<th>Time</th>
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<tr>
<td>09.30</td>
<td>Microbiological diversity of ancient architectonical structure of Wawel Royal Castle in Krakow, Poland</td>
<td>Magdalena Dyda; Adam Pyzik; Ewa Wilkojc; Beata Kwiatkowska-Kopka; Aleksandra Sklodowska</td>
<td>Research and Development for Life Sciences Ltd., University of Warsaw, Warsaw, Wawel Royal Castle, Krakow, Poland</td>
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<td>09.45</td>
<td>Characterization of historic mortars from Jerash Archaeological Site in Jordan</td>
<td>Abdelraheem Ahmad</td>
<td>Yarmouk University, Irbid, Jordan</td>
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<td>10.00</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>
<td>Magdalena Dyda; Ewa Wilkojc; Beata Kwiatkowska-Kopka; Oliwia Buchwald-Ziecina; Karolina Szlek; Sławomir Korzeniowski; Paulina Drabik; Aleksandra Skłodowska</td>
<td>Research and Development for Life Sciences Ltd., University of Warsaw, Warsaw, Wawel Royal Castle, Krakow, Poland</td>
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<td>10.15</td>
<td>Characterization and durability analysis of coral stones in a marine environment</td>
<td>Swathy Manohar; Manu Santhanam</td>
<td>Indian Institute of Technology Madras, India</td>
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<td>11.00-11.30</td>
<td>Coffee Break</td>
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<td>11.30-12.30</td>
<td>Topic 4.2 (Auditorium) Chair: Ioannis Karatasios &amp; Vassiliki Pachta</td>
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<td>11.30</td>
<td>Self-healing lime-based mortars using biological mechanisms and microvascular networks</td>
<td>Magdalini Theodoridou; Cristina De Nardi; Michael Harbottle; Anthony Jefferson</td>
<td>School of Engineering, Cardiff University, Wales, U.K.</td>
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<td>11.45</td>
<td>Comparative evaluation of the morphological and rheological characteristics of nanolime dispersions for the consolidation of architectural monuments</td>
<td>Anastasia Michalopoulou; Elisavet Michailidi; Evangelos Favvas; Noni-Pagona Maravelaki; Vassilis Kilikoglou; Ioannis Karatasios</td>
<td>N.C.S.R. “Demokritos”, Athens, Technical University of Crete, Akrotiri, Chania, Greece</td>
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<td>12.00</td>
<td>Photoactive Fe-TiO$_2$ Lime Plasters for Building Protection</td>
<td>Chrysi Kapridaki; Nikolaos Xynidis; Nikolaos Xekoukoulotakis; Nikolaos Kalithrakas-Kontos; Noni Maravelaki</td>
<td>Technical University of Crete, Chania, Crete, Greece</td>
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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 gypsum of Albarracín (Teruel) and Pallars (Lleida)**  
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 John Hughes & 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  
**Evaluation of the historic mortars of the museum of natural sciences of the city of La Plata, Argentina**  
Luis P. Traversa; Fabián H. Iloro; Sebastián Márquez  
LEMIT-CIC. Calle 52 entre 121 y 122, La Plata, Argentina

12.00  
**Mineralogical-petrographic characterization of terrazzo from selected 20th century monuments (Ljubljana, Slovenia)**  
Sabina Kramar; Maruša Borštnar; Nina Žbona  
Slovenian National Building and Civil Engineering Institute, Institute for the Protection of Cultural Heritage of Slovenia, Restoration centre, Ljubljana, Slovenia

12.15  
**When natural cement induces Portland cement decays**  
Elisabeth Marie-Victoire, Myriam Bouichou  
LRMH, CRC, CNRS, Ministère de la Culture, France
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<td>13.00-13.30</td>
<td>Closing Session (Auditorium)</td>
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<td>13.30-15.00</td>
<td>Buffet Lunch</td>
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<td>15.00-22.00</td>
<td><strong>Complimentary cultural activities</strong></td>
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<td>15.00 Bus to Olite</td>
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<td>15.30 Visit to the Castle of the Kings of Navarra and Church of Santa María (13th Century) in Olite</td>
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<td>17.30 Bus to Otazu</td>
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<td>18.00 Visit to Otazu Manor and Bodega Otazu winery. Cellar dinner</td>
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<td>21.30 Bus to Pamplona</td>
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