

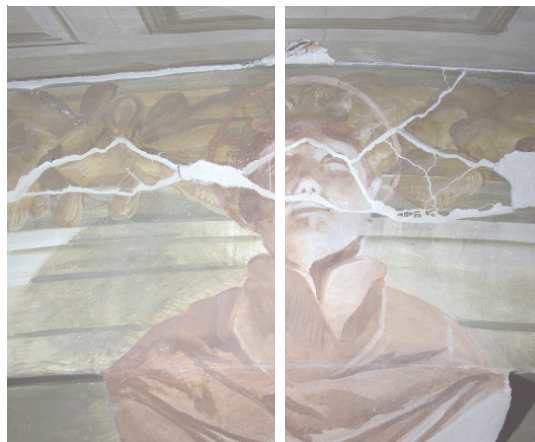
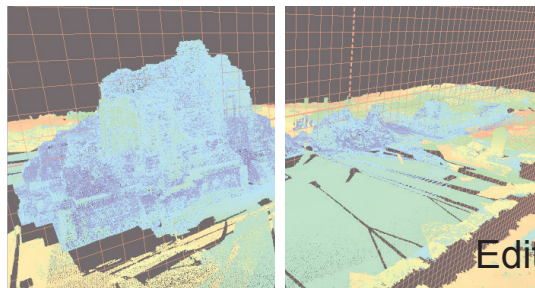
# International Conference Built Heritage 2013 Monitoring Conservation Management

POLITECNICO DI MILANO



CENTRO PER LA  
CONSERVAZIONE E  
VALORIZZAZIONE DEI  
BENI CULTURALI

POLITECNICO DI MILANO  
150°



Online Proceedings of the Conference  
**BUILT HERITAGE 2013**  
**Monitoring Conservation  
and Management**



Milan, Italy  
18-20 November 2013

Editor in chief M. Boriani  
Edited by R. Gabaglio, D. Gulotta

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## Day 1 - November 18th, Monday

### Room Rogers - Conservation and management

P.M. Koufopoulos & M. Myriantheos *The master plan for Wadi El Deir, Sinai Egypt: research and interventions*

M. Wu, S. Hu, Z. Xue, C. Shi *Monitoring and maintenance of built heritage within the daily management system: a case study of world cultural heritage Suzhou classic gardens in China*

L. De Marco, G. Franco, A. Magrini *Guidelines for eco-efficiency in the UNESCO site of Cinque Terre: an example of best practice*

A. Cazzani & C. Sangiorgio *Inventory, preservation and valorization of Historic roads In the Lombardy Region (Italy). Current policies and future plans*

K. Basili, R. Codello, G. De Vettor, P. Gasparoli, F. Pianezze, A.T. Ronchi, G. Totaro, F. Trovò *Wear processes in architectural heritage: definition, studies, contrasting measures. The case of UNESCO World Heritage Site "Venice and its Lagoon"*

S. Pratali Maffei & A. Marin *Forte Marghera and the entrenched field of Venice: a participatory process of planning and valorization*

R. Picone *Farmhouses in the Phlegrean Fields between archaeology and architectural palimpsest. A multi-disciplinary approach*

C.F. Carocci & C. Circo *"Needs-based architecture" in the Cyclades. A project for the enhancement and conservation of the architectural heritage and the rural landscape*

F. Colosi, R. Gabrielli, E.S. Malinverni, R. Orazi *Strategies and technologies for the knowledge, conservation and enhancement of a great historical settlement: Chan Chan, Perú*

E. Ciocchini, A. Maiocchi, F. Zangheri *The chapel of the Blessed Virgin of Miracles: a multidisciplinary approach for the project of conservation and reuse*

D. Concas, G. De Cesare, G. Capri *Santa Teresa from convent cloistered nuns to 'open' museum for the community*

C. Carocci, F. Campisi, I. Tranchina *The medieval Castle of Fossa (AQ). Analysis and restoration project*

I. Huic, M. Vujasinović, M.O. Šćitaroci *St. Mary on Lastre church in Beram, Istria, Croatia -multidisciplinary research, recommendations for restoration and further maintenance*

S. Dandria, F. Gabbrielli, M. Giamello, E. Giorgi, A. Magrini, E. Manzoni, F. Randazzo

*Grancia of Cuna: from the complexity of the historical building to a composed knowledge for the project*

G. Cardani & L. Binda *Guidelines for the masonry quality evaluation in built heritage*

E. Bersani, M. Giambruno, S. Pistidda *Planning for the historic built in developing countries: challenges and opportunities through the case study of Multan (Pakistan)*

M. Faliva *New York City Local Law 11/98: consequences of administrative regulations on the conservation of buildings*

K. Penna, E.S. Taylor, J.L. Tinoco *From paper to people: the complexities of developing guidelines for preservation education in developing countries*

#### **Room IV - ICT and new technologies**

F. Fassi, C. Achille, C. Monti, L. Fregonese, S. Parri, F. Rechichi, A. Mandelli, C. Monti, F. Gaudio, L. Galbusera *A yard of the future: the main spire of Milan Cathedral*

C. Pisu, P. Casu, S.M. Grillo *Multidisciplinary approach to the documentation of the XVIII century marble altars in Sardinia*

G. Fangi *Spherical photogrammetry for cultural heritage metric documentation: a critical examen six years after the beginning*

L. Pecchioli, F. Mohamed, M. Pucci, B. Mazzei *Museum of the sculptures of the basilica of Saint Silvestro integrating the visit at the catacombs of Priscilla in Rome*

C. Maierhofer, R. Krankenhagen, P. Myrach, J. Meinhardt, U. Kalisch, C. Hennen, R. Mecke, T. Seidl, M. Schiller *Monitoring of cracks in historic concrete structures using optical, thermal and acoustical methods*

V. Palieraki, C.E. Adami, E. Vintzileou *In-situ measurements using radar and boroscopy techniques: Case Study - Hagia Sophia Museum of Trabzon, Turkey*

Telmo Dias Pereira & D. Mateus *Monitoring noise and vibration emissions in Santa Clara-a-Velha Monastery*

L. Giorgi & P. Matracchi *The towers of San Gimignano. Architectural diagnostic for knowledge and conservation*

V. Russo, P. Cappelletti, G. Ceniccola, M. D'Amore, R. Landolfo, F. Portioli *Interdisciplinary conservation issues of an "unstable" architecture: researches about the bell tower of St. Augustine the Greater in Naples*

C. Giannico, A. Ferretti, S. Alberti *Satellite Radar interferometry: a new monitoring tool for cultural heritage sites*

A. Furini, M. Paternò, A. Pellegrinelli, P. Russo *Integrated measurement techniques for the monitoring of the ancient walls of Ferrara*

A. M. Manferdini *Documenting lost heritage. The experience of the survey of architectures damaged by the earthquake in the Emilia area, Italy*

J. Barton & R. Parsons *Use of leading edge Laser scanning and modelling technologies for Heritage conservation*

V. Bayarri, E. Castillo, J.M. García-Moncó, J. Calonge Diez *Integration of traditional and innovative techniques to resolve a complex case: monitoring the movement and temperature influence of the canvas in the south transept of the Church of the Convent of San Luis in San Vicente de la Barquera (Cantabria)*

A. Lionello, C. Rossi, P.P. Rossi *Testing and monitoring for the control of strengthening interventions of Santa Maria Gloriosa dei Frari in Venice*

E. Coisson & F. Ottoni *Monitoring historical structures, from their past to their future*

## **Room G.2 - Materials, preventive conservation and maintenance**

S. Sestini, M. Sammartino, M. Laurenzi Tabasso *Monitoring the performance of stone conservation treatments: technical and economic aspects*

E. Tesser, L. Lazzarini, R. Ganzerla, F. Antonelli *The decay of silicone resins applied for the consolidation of stone in Venice*

G. Bearman, E. Doehne, L. Beegle, W. Hug, R. Reid, R. Bhartia *Remote Detection of Biofilms on Stone*

S. Sasso, L. Scrano, E. Ventrella, M.G. Bonomo, A. Crescenzi, G. Salzano, S.A. Bufo *Natural biocides to prevent the microbial growth on cultural heritage*

A. Velosa, F. Rocha, A. Haugen *Mortars in Norway from the Middle Ages to the 20th Century: conservation strategy*

S. Voltolina, C. Aibéo, T. Cavallin, E. Egel, M. Favaro, V. Kamenova, L. Nodari, A. Pavlov, I. Pavlova, S. Simon, P. Scopece, E. Verga Falzacappa, A. Patelli *Assessment of atmospheric plasma torches for cleaning of architectural surfaces*

P. Ortiz, R. Ortiz, J.M. Martin, M.A. Vázquez *RIVUPH: an Andalusian project for risk analysis in historical cities*

R. Vecchiattini, G.L. Pesce, G. Quarta, L. Calcagnile *Sampling problems in the radio-carbon dating of old mortars and plasters with the "pure lime lumps" technique*

G. Litti, A. Audenaert, J. Braet, L. Lauriks *Energy environmental monitoring in historical*

*buildings; a simplified methodology for modeling realistic retrofitting scenarios. The case study of Schoonselhof Kasteel in Antwerp (Belgium)*

J. Sasaki, K. Koizumi, D. Ogura, T. Ishizaki, K. Hidaka *Research project on the conservation of Hagia Sophia, Istanbul - results of environmental monitoring*

R. Hendrickx, H. De Clercq, F. Decock, F. Descamps *Hygrothermal analysis of the façades of the former veterinary school in Anderlecht (Belgium) for the risk assessment of internal thermal insulation*

A. Caratelli, A.M. Siani, G.R. Casale, A. Paravicini, C. Bertolin, D. Camuffo *Indoor measurements of microclimate parameters in the Mithraeum in the Baths of Caracalla (Rome, Italy)*

H. Norrström *The EEPOCH Project - Multidisciplinary in a multiple case study*

I. Papayianni, M. Stefanidou, V. Pachtla *Survey of repaired and artificial stone at archaeological site of Pella five years after restoration works*

D. Gulotta, C. Tedeschi, S. Goidanich *Long-term evaluation of the salt decay susceptibility of NHL repair mortars*

A. Calia, D. Liberatore, N. Masini *Approach to the study of conservation of historical masonry mortars by means of the correlation between porosimetry and penetrometric test. First results*

## **Poster Session A**

E. de Almeida *Historic Center of Salvador, Bahia, Brazil: dilemma between conservation and cultural consumption*

Balayet Hossain *Historical imprints of Panam Nagar*

T. Basirico & K.B. Fazio *A multidisciplinary approach to the sustainable restoration of historical buildings: the case study of the San Francesco ex-convent in Piazza Armerina in Italy*

J.N. Bastos *The Algarve XVI-Th century Rural House – intervention for survival*

J.N. Bastos *The Fortress of Sagres (Portugal) - an heritage and restoration practice*

J. Bruin et al. *Uncovering mono-functional developments in a Seventeenth-century canal-zone block in the Canal District of Amsterdam World Heritage*

S. Bruni et al. *Post-earthquake recovery of architectural heritage: diagnostics, GIS documentation and restoration*

G. Buyukmihci & A. Ozkan *Integrity of conservation and sustainability techniques in a special historic site*

P. Chiodi et al. *A multidisciplinary approach: the conservation of an ancient bridge over the greater Zab river as part of community development plan of Deralok hydropower project under japanese international cooperation agency loan*

V. Cinieri & E. Zamperini *Lifecycle oriented approach for sustainable preservation of historical built heritage*

S. Colombo *An application of memory studies to museology: the case of Pinacoteca Ambrosiana between 1960s and 1990s*

F. Converti *The technological innovation of the knowledge areas: The Tourist Board of the City of Peastum*

T. Dreyfuss et al. *Transmitting Malta's legacy of forts and fortifications through the reuse of an abandoned 16th century warehouse*

R. Fabbri & S. Ciliani *For the valorization of the Monumental UNESCO Heritage: the system of signs pedestrian tourism in Ferrara and Modena*

B. Ferri & A. Maturo *Built cultural heritage and urban development: elements for a cultural planning in Pescara city*

C. Gentile et al. *Diagnostics and preservation strategies applied to historic iron infrastructures: the Paderno arch bridge (1889)*

P. Giandebiaggi & C. Vernizzi *The Roman amphitheater in Durres: the survey as a means of multidisciplinary knowledge for urban regeneration, architectural recovery and archaeological excavation*

K. Keutgens & B. Delmotte *Study of the architectural history of the St. Martin's Church, Zaventem, Flanders, by means of preliminary material-technical research*

C. Mura *Knowledge of modern architectural heritage in Sardinia through construction techniques. The case of rural architecture of Arborea (OR)*

B. Davide Petriaggi et al. *The restoration of the Domus of the Mithraeum of the Painted Walls (Ostia): a methodological approach*

S. Sadeghi *A concealed garden: critical view on the restoration of Ghasr Prison, Tehran, Iran*

G. Sanfilippo et al. *A systemic approach for the restoration project: the church of St. Anna in Piazza Armerina (EN)*



G. Verdiani et al. *Ad impossibilia nemo tenetur. Three case studies on built heritage elements at risk*

M.R. Vitale et al. *Methods and strategies for the 'sustainability of the ancient built-up: studies and preliminary analysis on the "Monte" quarter in Piazza Armerina*

## **Day 2 - November 19th, Tuesday**

### **Room Rogers - Conservation and management**

M. Landoni *Conservation project on Nandin hall at Vat Phou archaeological site (Laos PDR)*

J. Cassar, S. Cefai, M. Galea, R. Grima, K. Stroud, A. Torpiano *Preserving the Megalithic Temples of Malta - the interdisciplinary approach*

R. Buzancic *Restoration of Diocletian's mausoleum in Split*

G. Bagnasco Gianni, S. Bortolotto, P. Favino, A. Garzulino, M. Marzullo, E. Riva, R. Simonelli, S. Valtolina, A. Zerboni *Past&Present at Tarchna & Tarquinia: a flexible approach to make visible the invisible*

W. Terlikowski & P.L. Narloch *Specificity of research and reconstructions of ancient wall constructions in Syria, the area of Palmyra*

P. Pesaresi *The Herculaneum Conservation Project's programmed maintenance cycles for the archaeological site of Herculaneum*

D. Cavezzali & A. Giovagnoli *Conservation works of the Hall of Masks in the Domus Aurea, Rome*

G. Putaturo *Restoration of the Villa Reale of Monza*

P.N. Barrera & P.E. Bartholomew *Anthropology of Design: how traditional Korean architecture is redefining the terms of conservation, collaboration, and sustainable management*

A. Baila, L. Mazza, A. Anzani *Conservation and restoration of polychrome stone mosaics in the architectures of the historical park of Villa Tatti Tallacchini: the music pavillion - Cafe house*

T.L. Park *The process surrounding the preservation of historical wooden architecture in Japan*

F. Ottoni, F. Aureli, C. Mambriani, P. Mignosa *An integrated conservation process between history and hydraulics. The case of the ancient masonry "Tower of waters" in Colorno, Parma*

M. Borsotti & C. Campanella *An architectural project for existing buildings from understanding to writing*

M. Carlessi & A. Kluzer *Past, present and future of the forgotten places in the ancient "Ospedale Maggiore" (Ca' Granda) in Milan. Studies, surveys, analysis, prospects and projects*

A.C. Glória *The "private" cultural heritage: management, right and public fruition. The case of Cedovim manor's house (Vila Nova de Foz Côa, Portugal)*

#### **Room IV - ICT and new technologies**

S. Janvier-Badosa, C. Stefani, X. Brunetaud, K. Beck, L. De Luca, M. A-Mukhtar *Documentation and analysis of 3D mappings for monument diagnosis*

S. Bortolotto, A. Castiglioni, A. Castiglioni, N. Cattaneo, S. Massa *Complex Archaeological Sites: An integrated stratigraphic framework for progressive knowledge acquisition and representation*

A. Versaci, A. Cardaci, D. Indelicato, L. Fauzia *Integrated survey methodologies for the knowledge, restoration and valorization of modern architecture. The case study of the archaeological museum of Siracusa designed by Franco Minissi*

G. Bearman, E. Doehne, J. Voss, K. Merrill, R. Bagaria *Citizen Science and Mobile Phone cameras as tools for monitoring World Heritage*

T.E. Boothby *Ars sine scientia: how incorrect design theories lead to correct designs*

S. Arangio, S. Molinaro, F. Bontempi *Basic modeling for the forensic investigation of the collapse of a masonry structure*

K. Papadopoulos & E. Vintzileou *The new 'poles and empolia' for the columns of the ancient greek temple of Apollo*

Epikourios M. Vasic, D. Coronelli, C. Poggi *A multidisciplinary approach for the assessment of great historical structures: ties of "Duomo di Milano"*

S. Arangio, F. Bucchi, F. Bontempi *Pushover seismic analysis of masonry buildings with different commercial codes*

B. Benedetti & S. Montanari *Methodology and technology in two new museums in Saudi Arabia*

M. Negrini & N. Di Blas *Digital storytelling for Cultural Heritage: a modular, multi-channel, multi-scenario approach*

G. D'Amico, A. Del Bimbo, A. Ferracani, L. Landucci, D. Pezzatini *Onna project: a na-*

*tural interaction installation and mobile solution for cultural heritage*

M. Barcaro & E. Oliviero Scigno, *enriching the visitor's experience with a tablet*

## **Room G.2 - Materials, preventive conservation and maintenance**

C. Pasquarella, C. Balocco, E. Marmonti, G. Petrone, G. Pasquariello, R. Albertini *An integrated approach to the preventive conservation of cultural heritage: Computational Fluid Dynamics application*

C. Pasquarella, G. Pasquariello, C. Balocco, E. Sacconi, M. Ugolotti, O. Maggi, R. Albertini *An integrated approach to the preventive conservation of cultural heritage: indoor biological environmental monitoring*

E. Rosina & E. Rotta *Environmental protection and control systems for architectural and archaeological heritage*

A. Bonazza, I. Natali, I. Ozga, G. Bartolozzi, C. Cucci, V. Marchiafava, M. Picollo *Pollution effects on typical Florentine lithotypes: a multidisciplinary approach*

C. Di Benedetto, S. Bianchin, A. Langella, M. Favaro, A. Gambirasi, A. Colella, G. Luca, M. Soranzo, M. de' Gennaro, P. Cappelletti *The Neapolitan Yellow Tuff: experimental investigations about effectiveness of antishrinkage treatment*

S. Lugli, S. Minghelli, P. Zannini *Barium silicate consolidation of historical sandstones*

V. Tornari & A. Moropoulou *Crack micromorphology detection in stone samples by digital holographic speckle pattern interferometry*

L. Brizi & P. Fantazzini *Internal structure of porous media studied by the apparent water self-diffusion coefficient in the field gradient of a portable single-sided NMR instrument*

N. Proietti, D. Capitani, V. Di Tullio, R. Olmi, S. Priori, C. Riminesi, A. Sansonetti, F. Tasso, E. Rosina *MOdiHMA at Sforza Castle in Milano: Innovative Techniques for Moisture Detection in Historical Masonry*

M. Rossetto *Capillary rising damp in historical buildings: electrophysical charge neutralization technology - a needful "zero impact" instrument to prevent and resolve the problem once and for all*

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A. Goppion, A. Gioria, G. Cotrufo *Museology meets conservation: Goppion display-cases with multiple microclimate*

A. Bernardi, F. Becherini, A. Vivarelli, C. Ghiretti, E. Mendez Bertolo, L. Pockelé, M.D. Romero-Sanchez, N. Tellado, R. Wansdronk *Application of innovative technologies for energy storage to Cultural Heritage buildings*

M. Filippi, M. Rota, P. Picchi *The accreditation process for Museums in Regione Piemonte. Preventive conservation and indoor environment monitoring*

A. Grimoldi, D. Del Curto, A. Landi, C. Manfredi, L. Valisi *From rest/cons to en/eff: indoor environment and building preservation*

L. de Santoli, C. Calice, V. Coccia, V. Fazio *Multidisciplinary approach for renewal of historical center: the case study of Ceglie Messapica (BR)*

## **Poster Session B**

F. Agnello & R. Prescia *Integrated studies for the enhancement of complex historic monuments*

W. Bagiński *Using location-related knowledge to maintain a historic residence*

V. Bayarri-Cayón et E. Castillo *New processing tools for heritage conservation and documentation*

N. Benabdelkader & M. Morandotti *The historical site of Mansourah*

R. Cacciotti et al. *MONDIS Knowledge-based system: application of semantic web technologies to built heritage*

I. Cerato et al. *From the dig to 3D reconstruction and AR dissemination. The case study of the Roman kiln of Massa (IT)*

S. Karaman et al. *MNEMOSYNE: visual profiling for personalized cultural content delivery*

G. Leucci et al. *The Foggia Cathedral: an in situ integrated geophysical and mechanical study on the wooden structures of the ceiling*

M.F. Mancini et al. *From video sequence as a database for the generation of 3D models to video as a tool for architecture communication*

S. Pallara & C. Caiulo *Energy saving for historical heritage: the domotised lighting system of the Cathedral of Nardò (Lecce - Italy)*

B. De Roo et al. *Conservation of past times: data models for ensuring the future of our heritage*

I. Rubino *Step by step: exploring heritage through a mobile augmented reality application at Palazzo Madama - Museo Civico d'Arte Antica (Turin, Italy)*

E. Sassoni & C. Mazzotti *Assessment of masonry mortar compressive strength by double punch test: the influence of mortar porosity*

G.M. Ventimiglia *Role of diagnostic surveys in the conservation of the former mother-church of Santa Margherita di Belice in Sicily: preliminary tests and restoration site checks*

S. Zambruno et al. *Photographing the past: using cloud computing and photo-modelling for 3D historical architecture modelling*

### **Day 3 - November 20th, Wednesday**

#### **Room Rogers - Conservation and management**

A. Saisi, M. Guidobaldi, C. Gentile, L. Cantini *Dynamic and seismic assessment of the Gabbia tower in Mantua, Italy*

I. Stoyanova *Promoting a Nineteenth-century Italian Technology: the Crystal Skies of the Milanese Gallery "Vittorio Emanuele II"*

G. Vella & E. Messina *Fruition and valorization of disused manufacturing settlements: the "tonnare" of the Gulf of Castellammare case-studies*

A. Sanna & G. Monni *Recovery, reuse of designs of the Carbonia's dwelling. Proposal for a "Handbook for the Recovery of Modernist Building"*

Y. Salman, Z. Önsel Atala, N.B. Yöney *A model for an integrated multi-disciplinary approach for the preservation of 20th Century and modernist architectural Heritage*

R. Lozano Galvez *The multidisciplinary in the protection of the 20th Century architectonic patrimony*

P. Dellavedova *Instruments for the preservation and promotion of the 20th century built heritage: the case study of Legnano (MI)*

D. Sarti & L. Varra *The organization of a districtal museum: the Textile Museum of Prato between the preservation of an industrial heritage and the development of a sustainable system*

E. Invernizzi & M.M. Locatelli *Central Karakorum National Park and the Northern Areas territory: the "Cultural Heritage Routes" Project*

N. Berlucchi *A fortress for Brescia: the enhancement of the Castle and the Cidneo Hill*

K. Rajangam & P. Modi *Nakshay - a community led culture mapping initiative an attempt towards best practices and successful conservation*

P. Giandebiaggi, M. Rossi, C. Tedeschi *The "survey of memory". Cultural heritage in cemeteries: development of a catalogue protocol from the "representation" of multidisciplinary*

*disciplinary researches*

P. Gasparoli & A.T. Ronchi *Crespi d'Adda. Beyond the Management Plan: regulatory instruments for the management of built heritage transformations*

M. Achenza, I. Giovagnorio, L.G.F. Cannas *The 'earthen cities' itinerary*

J. Bruin et al. *Knowledge is Power: Monitoring the World Heritage site of Amsterdam, a policy analysis*

K. Rajangam & P. Modi *Heritage information management package (himp) -technology and experience driven approach towards efficiently managing india's built heritage sites*

#### **Room IV - ICT and new technologies**

S. Hermon, F. Niccolucci, K. Yiakoupi, A. Kolosova, G. Iannone, M. Faka, P. Kyriacou, V. Niccolucci *Documenting architectonic Heritage in conflict areas. The case of Agia Marina Church, Derynia, Cyprus*

L. Guerriero, S. Barba, E. De Feo, F. Fiorillo, A. Manco *Multidisciplinary analysis: the early christian complex in Cimitile (Italy)*

G. Verdiani, A. Peruzzi, M. Gualandi *The Piacenza Cathedral, from the digital survey to a complete multimedia documentation*

N. Masini, F. Gabellone, G. Leucci, R. Persico, F. Soldovieri *Enhancement of the information content available from non invasive diagnostics for restoration and knowledge of architectural heritage*

C.F. Carocci & A. Scudero *The restoration project of the church of Saint Agata in Tusillo (AQ, Italy) within the framework of the post-earthquake reconstruction plan*

M. Dolce, E. Speranza, R. Dalla Negra, M. Zuppiroli, F. Bocchi *Constructive features and seismic vulnerability of historic centres through the rapid assessment of historic building stocks. The experience of Ferrara, Italy*

R. Fabbri *Complex monumental heritage: problems and operational programs for post seismic restoration*

A.G. Mazzeri *Mantua Ducal Palace: one year after the earthquake. From emergency management to seismic improvement and programmed maintenance*

K. Nedvěďová & R. Pergl *Cultural Heritage and floods*

F. Niccolucci, A. Felicetti, N. Amico, A. D'Andrea *Quality control in the production of 3D documentation of monuments*

G. Guidi, P. Rodríguez Navarro, S. Gonizzi Barsanti, L.L. Micoli, M. Russo *Quick textured mesh generation in Cultural Heritage digitization*

P. Ronzino, F. Niccolucci, A. D'Andrea *Built Heritage metadata schemas and the integration of architectural datasets using CIDOC-CRM*

E. Demetrescu, G. Lucci Baldassarri, A. Pagano, S. Pescarin *CONNEXT: CONNecting metadata to web3D interactive applications of large archaeological contEXTs*

M. Riggio, J. Sandak, A. Sandak, I. Santoni, L. Babinski *Degradation of wooden surfaces in historical buildings: integrated sensing and modeling techniques for monitoring and conservation*

M.S. Okten, C. Haydaroglu, B.B. Okten *A structural design case study on reconstruction of a historical timber mansion*

V. Sousa, T. Dias Pereira, D. Silva *Asset management of built heritage: application to wood-framing elements of the National Palace of Sintra, Portugal*

## **Room G.2 - Materials, preventive conservation and maintenance**

L. Brambilla, P. Condoleo, S. Perego, G. Zerbi, L. Binda *Experimental study on the influence of the environment on the properties of vegetal resins used in the conservation of Cham temples in Vietnam*

A. Verganelaki, N. Maravelaki, V. Kilikoglou, I. Karatasios, I. Arampatzis, K. Siamos *Synthesis and characterization of a calcium oxalate-silica nano-composite for stone conservation*

G. Cappelletti, P. Fermo, A. Piazzalunga, G. Padeletti *Transparent hybrid films for stone preventive conservation*

T. Dreyfuss & J. Cassar *Ammonium oxalate treatment application in the presence of soluble salts: laboratory results on soft limestone*

M. Matteini, C. Colombo, G. Botticelli, M. Casati, C. Conti, R. Negrotti, E. Possenti, M. Realini *Ammonium phosphates to consolidate carbonatic stone materials: an inorganic mineral treatment greatly promising*

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R. Terra et al. *Restoration of San Petronio Basilica: four year project between innovation and eco-sustainability*

D. Vandevoorde et al. *Influence of environmental conditions on water adsorption measurements performed by non-destructive in situ applicable techniques*

C. Kapridaki & N. Maravelaki *TiO<sub>2</sub>-SiO<sub>2</sub>-PDMS nano-composite with self-cleaning properties for stone protection and consolidation*

C. Zambella et al. *Environmental monitoring of the St. Gennaro and St. Gaudioso catacombs in Naples*

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