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## 1. PERSONAL DATA

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Name: Pagona Maravelaki  
Place of birth: Chalkida, Evoia, Greece  
Date of birth: 3 December 1960  
Nationality: Hellenic  
Family staus: Married with two children  
Profession: Associate Professor, School of Architectural Engineering,  
Lab of Materials for Cultural Heritage and Modern  
Building (MaCHMoB), Technical University of Crete  
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## 2. EDUCATION

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1988-1992: Ph.D. Chemical Science, Department of Environmental Science, Ca Foscari  
Unniversity of Venice, Consortium Ferrara-Venezia-Trieste, Italia, 1992.  
Thesis Title: Chemical effect of the environment on exposed stone materials  
and methods for their conservation.  
Part of the thesis was carried out in the Ecole Polytechnique Fédérale de  
Lausanne (EPFL), Département des Matériaux, Laboratoire de Conservation de  
la Pierre, Lausanne, Suisse, (15/4/91-5/8/91).  
1978-1983: B.Sc. Department of Chemistry, National and Kapodistrian University of  
Athens.

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### **3. ACADEMIC SCHOLARSHIPS & AWARDS**

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- 1987-1988: Research Scholarship from the Italian Government to EU citizens. Awarded for postgraduate research studies in the “Centro di studio sulle Cause di Deperimento e sui Metodi di Conservazione delle Opere d'Arte-Consiglio Nazionale delle Ricerche (CNR)”, Florence, Italy.
- 1988-1989: Research Scholarship from the Syremont s.p.a. for postgraduate research studies in the “Centro di studio sulle Cause di Deperimento e sui Metodi di Conservazione delle Opere d'Arte-Consiglio Nazionale delle Ricerche (CNR)”, Florence, Italy.
- 1989-1992: Research Scholarship from the State Scholarships Foundation-IKY. Awarded for doctoral studies in the Department of Environmental Science, Ca Foscari University of Venice.
- 1996-1997: Fellowship of the American School of Classical Studies, Athens, Greece. Awarded for postdoctoral studies on the effects of laser cleaning on marble, in the "Institute of Electronic Structure & Laser", Foundation for Research and Technology - Hellas (FO. R. T. H.), Heraklion, Crete, Greece.
- August 2013: 1<sup>st</sup> Prize -"Encouraging and Supporting Academic and Research Institutes for Research and Development (R & D) Industrial/R&D Industry, (MED 2007-13)", 2<sup>nd</sup> Best Researcher Awards Contest, “Ecological nanomaterials for the protection of buildings”, P. Maravelaki, Associate Professor, School of Architectural Engineering, Lab of Materials for Cultural Heritage and Modern Building, Technical University of Crete.

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### **4. RESEARCH & TEACHING INTERESTS**

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Research interests focus on:

- Study of built heritage, more specifically the weathering and mechanisms of stone decay;
- Technology of historic mortars, pigments and ceramics;
- Cleaning techniques and laser cleaning of black crusts and stains appeared on the monumental facades;
- Assessment of cleaning with micro-destructive and nondestructive analytical techniques;
- Application and assessment of nondestructive spectroscopical techniques for the study of historic building materials;
- Development of eco-friendly and energy efficient plasters for building envelope;
- Development and characterization of novel self-cleaning nanocomposites for the conservation and protection of historic monuments;
- Development of innovative functional building and protection materials (mortars, protective coatings, consolidation materials) based on environmental friendly technological solutions, by incorporating nano-materials within the traditional ones used for restoration.

Teaching interests include:

- Influence of the environment on monuments and buildings
- Decay and conservation of building materials of monuments and architectural surfaces
- Protection and Enhancement of Archaeological Monuments and Sites
- Restoration of Existing Envelopes
- Technology of materials used in buildings
- Principles of Chemistry
- Invited lecturer at the Postgraduate Program of the National Technical University entitled "Protection of Monuments"
- Environmental effect on monuments: mechanisms, restoration methods and assessment, Postgraduate Program TUC.

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## 5. CAREER HISTORY

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- 2013-Present: Associate Professor, School of Architectural Engineering, Technical University of Crete.
- 2012-2008: Assistant Professor, Department of Sciences, Technical University of Crete.
- 1997-2008: Employee of the Ministry of Culture, 1<sup>st</sup> Department of Prehistoric and Classical Antiquities”, Athens, Greece, (1997) and “25<sup>th</sup> Department of Prehistoric and Classical Antiquities”, Chania, Crete, Greece (1998-2008).
- 1996-1995: Research Associate with the "Institute of Electronic Structure & Laser", Foundation for Research and Technology - Hellas (FO. R. T. H.), Heraklion, Crete, Greece.
- 1995-1993: Research Associate with the Department "Mineral Resources Engineering", Technical University of Crete, Chania, Crete, Greece.
- 1992: Research Associate with "Laboratoire de Conservation de la Pierre", Ecole Polytechnique Federale de Lausanne (EPFL), Lausanne, Switzerland, 1/4/92–31/7/92.
- 1987-1989: Research Associate with "Centro di Studio sulle Cause di Degrado e sui Metodi di Conservazione delle Opere d'Arte", Consiglio Nazionale delle Ricerche, Florence, Italy.
- 1983-1986: Teacher of chemistry to candidates of University in Private Schools, Athens.

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## 6. PUBLICATIONS

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### 6.1 PhD Thesis

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**P. V. Maravelaki**, “Chemical effect of the environment on exposed stone materials and methods for their conservation” (“Effetto Chimico dell'Ambiente su Superfici Lapidie Esposte ed

Indagini per un loro Recupero”), Tesi di Dottorato di Ricerca in Scienze Chimiche, IV ciclo, 1992, Università di Venezia, pages 150 (<http://phdtheses.ekt.gr/eadd/handle/10442/4199>).

## 6.2 REFEREED JOURNAL PUBLICATIONS

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- J1. “Laser Induced Breakdown Spectroscopy as a diagnostic technique for the Laser cleaning of marble”, **P. V. Maravelaki**, V. Zafiropoulos, M. Kalaitzaki, V. Kilikoglou and C. Fotakis, *Spectrochimica Acta*, part B, 52, 1997, pp. 41-53.
- J2. “Origin, characteristics and morphology of weathering crusts on Istria stone in Venice”, **P. Maravelaki-Kalaitzaki** and G. Biscontin, *Atmospheric Environment*, 33(11), 1999, pp. 1699-1709.
- J3. “Excimer laser cleaning of encrustation on Pentelic marble: procedure and evaluation of the effects”, **P. Maravelaki-Kalaitzaki**, V. Zafiropoulos and C. Fotakis, *Applied Surface Science*, 148, 1999, pp. 92-104.
- J4. “Sorel’s cement mortars: Decay susceptibility and effect on Pentelic marble”, **P. Maravelaki-Kalaitzaki** and G. Moraitou, *Cement and Concrete Research*, 29(12), 1999, pp. 1929-1935.
- J5. “Investigations on cleaning of black crusted sandstone using different UV-pulsed lasers”, G. Marakis, **P. Maravelaki**, V. Zafiropoulos, S. Klein, J. Hildenhagen, K. Dickmann, *Journal of Cultural Heritage*, 1, 2000, pp. 61s-64s.
- J6. “Compositional characterization of encrustation on marble with laser induced breakdown spectroscopy”, **P. Maravelaki-Kalaitzaki**, D. Anglos, V. Kilikoglou, V. Zafiropoulos, *Spectrochimica Acta*, part B, 56(6), 2001, pp. 887-903.
- J7. “Evaluation of the Initial Weathering Rate of Istria Stone Exposed to Rain Action, in Venice, with X-ray Photoelectron Spectroscopy”, **P. Maravelaki-Kalaitzaki**, R. Bertoncello, G. Biscontin, *Journal of Cultural Heritage*, 3, 2002, pp. 273-282.
- J8. “Physico-chemical Study of Cretan Ancient Mortars”, **P. Maravelaki-Kalaitzaki**, A. Bakolas, A. Moropoulou, *Cement and Concrete Research*, 33/5, 2003, pp. 651-661.
- J9. “Short Free Running Nd:YAG laser to clean different encrustation on Pentelic marble: procedure and evaluation of the effects”, **P. Maravelaki-Kalaitzaki**, V. Zafiropoulos, P. Pouli, D. Anglos, C. Balas, R. Salimbeni, S. Siano, R. Pini, *Journal of Cultural Heritage*, 4, S1, 2003, pp. 77-82.
- J10. “Comparative study on the application of the 1<sup>st</sup> and the 3<sup>rd</sup> harmonic of a Nd: YAG laser system to clean black encrustation on marble”, G. Marakis, P. Pouli, V. Zafiropoulos, **P. Maravelaki-Kalaitzaki**, *Journal of Cultural Heritage*, 4, S1, 2003, pp. 83-91.
- J11. “Yellowing effect and discoloration of pigments: Experimental and Theoretical studies”, V. Zafiropoulos, C. Balas, A. Manousaki, G. Marakis, **P. Maravelaki-Kalaitzaki**, K. Melesanaki, P. Pouli, T. Stratoudaki, S. Klein, J. Hildenhagen, K. Dickmann, B. S. Luk’yanchuk, C. Mujat, A. Dogariu, *Journal of Cultural Heritage*, 4, S1, 2003, pp. 249-256.
- J12. “Pigment and Terracotta Analyses of Hellenistic Figurines, in Crete”, **P. Maravelaki-Kalaitzaki**, N. Kalithrakas-Kontos, *Analytica Chimica Acta*, 497, 2003, pp. 209-225.
- J13. “EDXRF as an analytical tool in art: case studies from pigment identification and treatment assessment”, N. Kallithrakas-Kontos, **P. Maravelaki-Kalaitzaki**, *Journal of Radioanalytical and Nuclear Chemistry*, 262(3), 2004, pp. 713-719.

- J14. “Hydraulic lime mortars for the restoration of the historic masonry in Crete”, **P. Maravelaki-Kalaitzaki**, I. Karatasios, A. Bakolas, V. Kilikoglou, *Cement and Concrete Research*, 35, 2005, pp. 1577–1586.
- J15. “Black crusts and patinas on Pentelic marble from the Parthenon and Erechtheum (Acropolis, Athens): characterization and origin, **P. Maravelaki-Kalaitzaki**, *Analytica Chimica Acta*, 532, 2005, pp. 187-198.
- J16. “Evaluation of silicon-based strengthening agents on porous limestones”, **P. Maravelaki-Kalaitzaki**, N. Kallithrakas-Kontos, D. Korakaki, Z. Agioutantis, S. Maurigiannakis, *Progress in Organic Coatings*, 57, 2006, pp. 140-148.
- J17. “Optical inspection for quantification of decay on stone surfaces”, P. Kapsalas, **P. Maravelaki-Kalaitzaki**, M. Zervakis, E.T. Delegou, A. Moropoulou, *NDT&E International*, 40, 2007, pp. 2-11.
- J18. “Hydraulic lime-mortars with siloxane for waterproofing historic masonry”,**P. Maravelaki-Kalaitzaki**, *Cement and Concrete Research*, 37(2), 2007, pp. 283-290.
- J19. “Evaluation of Image Segmentation Approaches for Non-Destructive Detection and Quantification of Corrosion Damage on Stonework”, P. Kapsalas, M. Zervakis and **P. Maravelaki-Kalaitzaki**, *Corrosion Science*, 49, 2007, pp. 4415–4442.
- J20. “A Morphological Fusion Algorithm for Optical Detection and Quantification of Decay Patterns on Stone Surfaces”, P. Kapsalas, **P. Maravelaki-Kalaitzaki**, M. Zervakis, E.T. Delegou, A. Moropoulou, *Construction and Building Materials*, 22, 2008, pp. 228-238.
- J21. “Chemical characterization of Cretan clays for the design of restoration mortars”, Meral Budak, **Pagona Maravelaki-Kalaitzaki**, Nikolaos Kallithrakas-Kontos, *Microchimica Acta*, 162, 2008, pp. 325-331.
- J22. “A comparative study of porous limestones treated with silicon-based strengthening agents”, **P. Maravelaki-Kalaitzaki**, N. Kallithrakas-Kontos, Z. Agioutantis, S. Maurigiannakis, D. Korakaki, *Progress in Organic Coatings*, 62, 2008, pp. 49–60.
- J23. "Application of  $^1\text{H}$  NMR in hydration and porosity studies of lime pozzolan mixtures", M. Tziotziou, E. Karakosta, I. Karatasios, G. Diamantopoulos, A. Sapalidis, M. Fardis, **P. Maravelaki-Kalaitzaki**, G. Papavassiliou, V. Kilikoglou, *Microporous & Mesoporous Materials*, Volume 139, Issue 1-3, 2011, pp 16-24.
- J24. "Physico-chemical characterization of mortars as a tool in studying specific hydraulic components: application to the study of ancient Naxos aqueduct", **P. Maravelaki-Kalaitzaki**, A. Galanos, I. Doganis, N. Kallithrakas-Kontos, *Applied Physics A: Materials Science & Processing*, Volume 104, Issue 1, 2011, pp. 335-348.
- J25. "Development and analysis of mineral based coatings for buildings and urban structures", Kolokotsa, D., **Maravelaki-Kalaitzaki, P.**, Papantoniou, S., Vangeloglou, E., Saliari, M., Karlessi, T., & Santamouris, M., *Solar Energy*, Volume 86, Issue 5, 2012, pp. 1648–1659.
- J26. "TiO<sub>2</sub>-SiO<sub>2</sub>-PDMS nano-composite hydrophobic coating with self-cleaning properties for marble protection", Kapridaki, C., & **Maravelaki-Kalaitzaki, P.**, *Progress in Organic Coatings*, Volume 76, Issue 2-3, 2013, pp. 400–410.
- J27. "Physico-chemical and Mechanical Characterization of Hydraulic Mortars Containing Nano-Titania for Restoration Applications", **Maravelaki-Kalaitzaki, P.**, Agioutantis, Z., Lionakis, E., Stavroulaki, M., & Perdikatsis, V., *Cement and Concrete Composites*, Volume 36, Issue 1, 2013, pp. 33-41.
- J28. “Producing photoactive, transparent and hydrophobic SiO<sub>2</sub>/crystalline TiO<sub>2</sub> nanocomposites at ambient conditions with application as self-cleaning coatings”, C

- Kapridaki, L Pinho, MJ Mosquera, **P Maravelaki-Kalaitzaki**, *Applied Catalysis B: Environmental* 156, 2014, pp. 416-427.
- J29. “A biomimetic approach to strengthen and protect construction materials with a novel calcium-oxalate–silica nanocomposite”, A Verganelaki, V Kilikoglou, I Karatasios, **P Maravelaki-Kalaitzaki**, *Construction and Building Materials* 62, 2014, pp. 8-17.
- J30. “Study of the stability of siloxane stone strengthening agents”, Elena Tesser, Fabrizio Antonelli, Laura Sperti, Renzo Ganzerla, **Noni-Pagona Maravelaki**, *Polymer Degradation and Stability*, Volume 110, 2014, pp. 232-240.
- J31. “Development and analysis of advanced inorganic coatings for buildings and urban structures”, K. Gobakis D. Kolokotsa, **N. Maravelaki-Kalaitzaki**, V. Perdikatsis, M. Santamouris, *Energy and Buildings*, Volume 89, 2015, pp. 196–205.
- J32. “Modified tetraethoxysilane with nano-calcium oxalate in one-pot synthesis for protection of building materials” by Anastasia Verganelaki, Chrysi Kapridaki and **Pagona Maravelaki-Kalaitzaki**, *Ind. Eng. Chem. Res.*, 54 (29), (2015), p. 7195-7206. 2015 American Chemical Society.
- J33. “Chrysotile asbestos detoxification with a combined treatment of oxalic acid and silicates producing amorphous silica and biomaterial”, Aikaterini Valouma, Anastasia Verganelaki, **Pagona Maravelaki-Kalaitzaki**, Evangelos Gidaracos, *Journal of Hazardous Materials*, 305, (2016), 164-170.

### 6.3 REFEREED CHAPTERS IN BOOKS (10)

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- B1 “What is the state of our knowledge of the mechanisms of deterioration and how are our estimates of rates of deterioration?”, H.A. Viles, D. Camuffo, S. Fitz, B. Fitzner, O. Lindqvist, R.A. Livingston, **P.V. Maravelaki**, C. Sabbioni, T. Warscheid, In: *Saving Our Architectural Heritage: The Conservation of Historic Stone Structures*, edited by Baer, N. S. and R. Snethlage, Wiley, 1997, pp. 95-112.
- B2 “Innovative techniques for the characterization of encrustation on Pentelic marble from the Parthenon”. **P. Maravelaki-Kalaitzaki**, In: *Cultural Heritage Conservation and Environmental Impact Assessment by Non-Destructive Testing and Micro-Analysis*, edited by R. Van Grieken & K. Janssens, A.A Balkema publishers, 2005 Talyor & Francis Group, London, pp. 135-148.
- B3 “Machine Vision Schemes Towards Detecting & Estimating The State Of Corrosion”, P.Kapsalas, M. Zervakis, **P. Maravelaki-Kalaitzaki**, E.T. Delegou, A. Moropoulou, Chapter 4 in Book "Pattern Recognition and Signal Processing in Archaeometry: Mathematical and Computational Solutions for Archaeology", Author(s)/Editor(s): Constantin Papaodysseus (National Technical University of Athens, Greece), Published in the United States of America by Information Science Reference (an imprint of IGI Global), 2012, DOI: 10.4018/978-1-60960-786-9, pp. 148-167.
- B4 “Application of <sup>1</sup>H NMR to the hydration monitoring of lime-pozzolan mortars”, M. Tziotziou, E. Karakosta, I. Karatasios, M. Fardis, **P. Maravelaki-Kalaitzaki**, G. Papavassiliou, V. Kilikoglou, in: J. Válek et al. (eds.), *Historic Mortars: Characterisation, Assessment and Repair*, Part IV: Assessment and Testing, RILEM Bookseries 7, DOI 10.1007/978-94-007-4635-0\_34, © RILEM 2012, pp. 435-442.
- B5 "Appendix: Non-destructive qualitative and quantitative analyses of a Minoan ring by a portable EDXRF", N. Kallithrakas-Kontos and **P. Maravelaki-Kalaitzaki**, in E.

- Papadopoulou, "Gifts to the Goddess: A Gold Ring from Mylopotamos, Rethymnon", Athenische Abteilung, Mitteilungen des Deutschen Archäologischen Instituts, Athenische Abteilung (AM), Band 126 - 2011, Gebr. Mann Verlag, 2014, pp. 21-22.
- B6 "Improvement of properties of hydraulic mortars with addition of nano-titania", **N. Maravelaki**, C. Kapridaki, E. Lionakis, A. Verganelaki, In Adhesives: Mechanical Properties, Technologies and Economic Importance, Chapter 4, Editor Dario Croccolo, Nova Science Publishers, Inc., 2014, pp. 79-93.
- B7 "Characterization of a newly synthesized calcium oxalate-silica nanocomposite and evaluation of its consolidation effect on limestones", A. Verganelaki, **N. Maravelaki**, V. Kilikoglou, I. Karatasios, I. Arampatzis, K. Siamos, Built Heritage. Monitoring Conservation Management, Editor(s): M. Boriani, G. Guidi, L. Toniolo, Springer, 2015, pp. 391-402.
- B8 "Mix Design Parameters of Restoration Mortars: The Effect of Aggregate Characteristics", M Amenta, I Karatasios, A Kalagri, **P Maravelaki-Kalaitzaki**, V Kilikoglou, Engineering Geology for Society and Territory - Volume 5: Urban Geology, Sustainable Planning and Landscape Exploitation, 2015, pp. 85-88.
- B9 "Synthesis and Characterization of a Calcium Oxalate-Silica Nanocomposite for Stone Conservation", **Pagona-Noni Maravelaki**, Anastasia Verganelaki, Vassilis Kilikoglou and Ioannis Karatasios, Engineering Geology for Society and Territory - Volume 8, G. Lollino et al. (eds.) Springer International Publishing Switzerland, 2015, pp. 525-529.
- B10 "TiO<sub>2</sub>-SiO<sub>2</sub>-PDMS nanocomposites with self-cleaning properties for stone protection and consolidation", Chrysi Kapridaki, **Pagona Maravelaki**, In: Prikryl, R., Török, Á, Gómez-Heras, M., Miskovsky, K. & Theodoridou, M. (eds) Sustainable Use of Traditional Geomaterials in Construction Practice. Geological Society, London, Special Publications, 416. First published online [March], [2015], [dx.doi.org/10.1144/SP416.6](https://doi.org/10.1144/SP416.6).

#### 6.4 REFEREED JOURNAL PUBLICATIONS IN INTERNATIONAL PERIODICAL VOLUMES (8)

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- JP1. G. Borselli, M. Camaiti, A. Pasetti, **P. Maravelaki**, U. Matteoli, "La conservazione del patrimonio monumentale. Protettivi impiegati nella conservazione dei materiali lapidei: storia, impieghi e sviluppi", *L' Edilizia*, 4, 1990, pp. 67-78.
- JP2. G. Biscontin, V. Fassina, **P. Maravelaki**, E. Zendri, "Venice: Stone material behaviour in connection with the environment", *Materials Issues in Art and Archaeology II*, edited by Vandiver, Pamela B. Druzik, James; and Wheeler, George Segal, Pittsburgh: Materials Research Society, vol. 185, 1991, pp. 253-263.
- JP3. **P. Maravelaki**, R. Bertoncetto, G. Biscontin, G. Battaglin, E. Zendri, E. Tondello, "Investigations of the surface processes on exposed limestones", *Materials Issues in Art and Archaeology III*, edited by Vandiver, Pamela B. Druzik, James; and Wheeler, George Segal, Pittsburgh: Materials Research Society, vol. 267, 1992, pp. 943-953.
- JP4. **P. Maravelaki**, G. Biscontin, E. Zendri, R. Polloni, W. Cecchetti, "Cleaning with LASER radiation on Istria stone", *Materials Issues in Art and Archaeology III*, edited by Vandiver, Pamela B. Druzik, James; and Wheeler, George Segal, Pittsburgh: Materials Research Society, vol. 267, 1992, pp. 955-961.

- JP5. G. Biscontin, **P. Maravelaki**, E. Zendri, A. Glisenti, “Siliconic and acrylic resins dispersed in water as protectives for stone surface”, *Materials Issues in Art and Archaeology III*, edited by Vandiver, Pamela B. Druzik, James; and Wheeler, George Segan, Mat. Res. Soc. Symp. Proc. Pittsburgh: Materials Research Society, vol. 267, 1992, pp. 935-941.
- JP6. C. Fotakis, V. Zafiropoulos, D. Anglos, S. Georgiou, **N. Maravelaki**, A. Fostiridou and M. Doulgeridis, “Lasers in art conservation”, In: *The Interface between Science and Conservation*, edited by S. Bradley, The Trustees of the British Museum, 1997, 16, pp. 83-90.
- JP7. **P. Maravelaki**, V. Zafiropoulos, V. Kilikoglou, M. Kalaitzaki, C. Fotakis, “Diagnostic techniques for the laser cleaning of marble”, *Restauratorenblätter*, Sonderband – Lacona I, Lasers in the Conservation of Artworks, edited by E. König and W. Kautek, Verlag Mayer & Comp. Vienne, 1997, pp. 31-35.
- JP8. A. Moropoulou, **P. Maravelaki-Kalaitzaki**, M. Borboudakis, A. Bakolas, P. Michailidis, M. Chronopoulos, “Historic mortars technologies in Crete and guidelines for compatible restoration mortars”, *PACT, Journal of the European Study Group on Physical, Chemical, Biological and Mathematical Techniques Applied to Archaeology*, Ed. G. Biscontin, A. Moropoulou, M. Erdik, J. Delgado Rodrigues, Publ. Technical Chamber of Greece, Athens, vol. 55, 1998, pp. 55-72.

## 6.5 REFEREED CONFERENCE PROCEEDINGS - FULL PAPERS) (55)

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- CP1. G. Alessandrini, R. Bugini, P. Barabino, G. Belezza, M. Momo, G. Biscontin, P. Maravelaki, G. Brunetti, P. Carbone, L. Paolini, S. Volpin, “Indagini conoscitive multidisciplinari per un cantiere di restauro: La Palazzina da caccia di Stupinigi”, *Scienza e Beni Culturali II*, edited by G. Biscontin, M. dal Colle and S. Volpin, Publ. Libreria Progetto Editore, Padova, 1989, pp. 699-714.
- CP2. C. Manganelli del Fa', M. Camaiti, G. Borselli, **P. Maravelaki**, P. Tiano, “Variazione del grado di idratazione dell'ossalato di calcio in funzione delle condizioni termoigrometriche”, Proc. 1<sup>st</sup> Intern. Symposium, *The Oxalate films: origin and significance in the conservation of works of art*, Publ. Centro ‘Gino Bozza’ per lo studio delle cause di deperimento e dei metodi di conservazione delle opere d’arte, Milan, 1989, pp. 91-101.
- CP3. G. Biscontin, G. Cristinelli, **P. Maravelaki**, A. Marigo, G. Vianello, E. Zendri, “Indagini conoscitive per un progetto di restauro dei materiali lapidei del Portale di S. Maria dei Servi a Venezia”, *Scienza e Beni Culturali VII*, edited by G. Biscontin and D. Mietto, Publ. Libreria Progetto Editore, Padova, 1991, pp. 813-833.
- CP4. **P. Maravelaki**, E. Zendri, G. Biscontin, G. Repaci, “Indagini sulle superfici in pietra d'Istria a Venezia”, *Scienza e Beni Culturali VII*, edited by G. Biscontin and D. Mietto, Publ. Libreria Progetto Editore, Padova, 1991, pp. 911-921.
- CP5. M. T. Berlasso, A. Bruschi, G. Longega, T. Pagani, T. Perusini, A. Proietti, G. Biscontin, G. Repaci, **P. Maravelaki**, E. Zendri, G. Galeazzo, P. Spadea, “Studi preliminari per un intervento conservativo del Duomo di Udine”, *Scienza e Beni Culturali VII*, edited by G. Biscontin and D. Mietto, Publ. Libreria Progetto Editore, Padova, 1991, pp. 923-942.
- CP6. G. Biscontin, C. Felix, **P. Maravelaki**, E. Zendri, “Characteristics, weathering forms and mechanisms of Istria stone in Venice”, Proc. of the 2<sup>nd</sup> Intern. Symp, *The conservation of*



- Monuments in the Mediterranean Basin*, edited by D. Decrouez, J. Chamay and F. Zezza, Geneve, 1991, pp. 141-153.
- CP7. G. Biscontin, **P. Maravelaki**, E. Zendri, "The case of Portale di S. Maria dei Servi, in Venice: results of physico-chemical inquiries", Proc. of the 2<sup>nd</sup> Intern. Symp. *The Conservation of Monuments in the Mediterranean Basin*, edited by D. Decrouez, J. Chamay and F. Zezza, Geneva, 1992, pp. 155-166.
- CP8. C. Felix and **P. Maravelaki**, "Black crusts with different origins on limestones and sandstones", *Materials Science and Restoration*, Proc. 3<sup>rd</sup> Inter. Coll. Technische Akademie Esslingen, edited by F. H. Wittman, DI Elmar Wippler, expert verlag, vol. 3, 1992, pp. 1728-1740.
- CP9. R. Bertoncetto, G. Biscontin, **P. Maravelaki**, E. Tondello, E. Zendri, "Indagini sui processi di trasformazioni superficiali di materiali lapidei", Proc. *Symposium Omaggio Scientifico a R. Turizziani*, Roma, 1992, vol. I, pp. 215-228.
- CP10. G. Biscontin, A. Bacolas, **P. Maravelaki**, E. Zendri, "Indagini sulle azioni chimicofisiche dell'ambiente su laterizi", *Scienza e Beni Culturali VIII*, edited by G. Biscontin and D. Mietto, Publ. Libreria Progetto Editore Padova, 1992, pp. 367-377. (cited: AATA n. 30-3147)
- CP11. **P. Maravelaki**, G. Biscontin, R. Polloni, W. Cecchetti and E. Zendri, "Investigation on surface alteration of limestone related to cleaning processes", in Proc. 7<sup>th</sup> Intl. Congress on *Deterioration and Conservation of Stone*, edited by J. Delgado Rodrigues, F. Henriques and F. T. Jeremias, Lisbon: Laboratorio Nacional de Engenharia Civil, 1992, pp. 1093-1102.
- CP12. **P. Maravelaki**, G. Biscontin, L. Marchesini, G. Repaci, "Evaluation of deterioration processes on the Istria stone of Venetian monuments", in Proc. 7<sup>th</sup> Intl. Congress on *Deterioration and Conservation of Stone*, edited by J. Delgado Rodrigues, F. Henriques and F. T. Jeremias, Lisbon: Laboratorio Nacional de Engenharia Civil, 1992, vol. 1, pp. 163-173.
- CP13. C. Felix, **P. Maravelaki**, "Black crusts with different origins on the Istria Stone in Venice", in Proc. 7<sup>th</sup> Intl. Congress on *Deterioration and Conservation of Stone*, edited by J. Delgado Rodrigues, F. Henriques and F. T. Jeremias, Lisbon: Laboratorio Nacional de Engenharia Civil, 1992, pp. 267-276.
- CP14. G. Biscontin, A. Bakolas, E. Zendri, **P. Maravelaki**, "Microstructural characteristics of historical Venetian mortars", *Conservation of Stone and Other Materials*, edited by M.J. Thiel, RILEM UNESCO, Publ. E&FN SPON, Chapman & Hall, Paris, vol. 2, 1993, pp. 178-185.
- CP15. A. Moropoulou, G. Biscontin, P. Theoulakis, K. Bisbikou, E. Zendri, A. Bakolas, **P. Maravelaki**, "Behavior of the bricks of the Corfu Venetian fortress", *Conservation of Stone and Other Materials*, edited by M.J. Thiel, RILEM UNESCO, Publ. E&FN SPON, Chapman & Hall, Paris, vol. 2, 1993, pp. 402-410.
- CP16. G. Biscontin, **P. Maravelaki**, E. Zendri, A. Glisenti, E. Tondello, "Investigation into the interaction between aqueous and organic solvent protective and building materials", *Conservation of Stone and Other Materials*, edited by M.J. Thiel, RILEM UNESCO, Publ. E&FN SPON, Chapman & Hall, Paris, vol. 2, 1993, pp. 689-696.
- CP17. A. Bakolas, G. Biscontin, Th. Markopoulos, **P. Maravelaki**, E. Repouskou, E. Zendri, "Indagini su calcestruzzi usati nell'area archeologica di Knossos", *Scienza e Beni Culturali IX*, edited by G. Biscontin, Publ. Libreria Progetto Editore Padova, 1993, pp. 403-414.
- CP18. **P. Maravelaki**, Th. Markopoulos, P. Trimantilli-M<sup>c</sup>Gann, E. Repouscou, "Problemi di degrado dei materiali lapidei e delle malte delle fortificazioni veneziane a Chania", Proc.

- Intern. Symposium, *Le pietre da costruzione: il tufo calcareo e la pietra Leccese*, Consiglio Nazionale delle Ricerche-Progetto Finalizzato Edilizia: Istituto per la Residenza e le Infrastrutture Sociali (CNR-IRIS), Bari, Italy, 1993, pp. 389-405.
- CP19. G. Biscontin, G. Driussi, **P. Maravelaki** and E. Zendri, “Physical-chemical investigations of stone architectonic surfaces in Venice: the Scuola Grande dei Carmini”, In: *Conservation of Architectural Surfaces: Stones and Wall Covering*, edited by G. Biscontin and L. Graziano, Il Gardo, Venice, 1993, pp. 125-136.
- CP20. Th. Markopoulos, **P. Maravelaki**, E. Repouskou, “The materials of the Venetian fortifications in Chania: properties, weathering forms and mechanisms”, Proc. of the 3<sup>rd</sup> Intern. Symp. *The Conservation of Monuments in the Mediterranean Basin*, edited by V. Fassina and F. Zezza, Venice, 1994, pp. 687-692.
- CP21. **P. Maravelaki**, V. Zafirooulos, M. Kalaitzaki, V. Kylikoglou and C. Fotakis, “Diagnostic techniques for the laser cleaning of marble”, In Proc. 8<sup>th</sup> Intl. Congress on *Deterioration and Conservation of Stone*, edited by J. Riederer, Moller Druck and Verlag, Berlin, 1996, pp. 1395-1404.
- CP22. **P. Maravelaki**, V. Zafirooulos, V. Kilikoglou and C. Fotakis, “Laser cleaning of marble”, Proc. 7<sup>th</sup> Workshop *Eurocare-Euomarble EU 496*, edited by P. Koutsoukos, C. Kontoyannis, Foundation of Research & Technology, Institute of Chemical Engineering & High Temperature Chemical Processes (ICE/HT-FORTH), Patras, 1996, pp. 74-93.
- CP23. **P. Maravelaki-Kalaitzaki**, “Encrustation on Pentelic marble: cleaning and evaluation with laser techniques”, Proceedings of the Interdisciplinary Workshop “*The Building Stone in Monuments*”, Publications IGME, edited by M. Varti-Matarangas and Y. Katsikis, Athens, 2002, pp. 321-333.
- CP24. **P. Maravelaki-Kalaitzaki**, “Innovative techniques for the characterization of encrustation on Pentelic marble from the Parthenon”, 7<sup>th</sup> International Conference on *Non-Destructive Testing and Microanalysis for the Diagnostics and Conservation of Cultural and Environmental Heritage*, Belgium, 2-6 June 2002, Book of Extended Abstracts, 12 pages (**invited**).
- CP25. **P. Maravelaki-Kalaitzaki**, N. Kallithrakas-Kontos, “Barium hydroxide as strengthening agent for porous limestones: assessment of efficiency after fifteen years of treatment”, Proceedings of *Science and Cultural Heritage XIX<sup>th</sup> International Congress*, “REVERSIBILITY IN RESTORATIONS: Thoughts, experiences, research routes”, July 2003, Bressanone, Italy, pp. 307-315.
- CP26. **P. Maravelaki-Kalaitzaki**, N. Kallithrakas-Kontos, “Surface Analysis in Archaeology and Conservation by EDXRF”, Proceedings of the 3<sup>rd</sup> International Conference on *Non-Destructive Testing of the Hellenic Society for NDT*, 15-18 October 2003, Chania, Crete, Greece, pp. 235-240.
- CP27. V. Zafirooulos, P. Pouli, V. Kylikoglou, **P. Maravelaki-Kalaitzaki**, B. S. Luk’yanchuk and A. Dogariu, “Synchronous Use of IR and UV Laser Pulses in the Removal of Encrustation: Mechanistic Aspects, Discoloration Phenomena and Benefits”, *Lasers in the Conservation of Artworks, Springer Proceedings in Physics*, Vol. 100, 2005, pp. 311-318.
- CP28. **P. Maravelaki-Kalaitzaki**, Z. Agioutantis, S. Maurigiannakis, N. Kallithrakas-Kontos, “Evaluation of the effectiveness of silicon-based strengthening agents on porous limestones”, Proceedings 10<sup>th</sup> International Congress on *Deterioration and Conservation of Stone*, Stockholm June 27-July 2, 2004, ICOMOS Sweden, edited by D. Kwiatkowski and R. Lofvendahl, vol. I, pp. 487-494.
- CP29. **P. Maravelaki-Kalaitzaki**, “Restoration of the Venetian Fortress of Firka, Chania, Crete, Greece”, 7<sup>th</sup> National Congress on *Mechanics (HSTAM2004)*, Hellenic Society for

- Theoretical & Applied Mechanics, Technical University of Crete, Eds. A. Kounadis, C. Providakis and G. Exadaktylos, June 24-26, 2004, Chania, Crete, Greece, pp. 44-50.
- CP30. Z. Agioutantis, S. Maurigiannakis, **P. Maravelaki-Kalaitzaki**, “Modeling the behavior of strengthening agents on porous geomaterials”, *7<sup>th</sup> National Congress on Mechanics (HSTAM2004)*, Hellenic Society for Theoretical & Applied Mechanics, Technical University of Crete, Eds. A. Kounadis, C. Providakis and G. Exadaktylos, June 24-26, 2004, Chania, Crete, Greece, pp. 138-143.
- CP31. **P. Maravelaki-Kalaitzaki**, “Characterization of weathering crusts from monuments in Athens, Greece”, *Proceedings International Workshop on Air Pollution and Cultural Heritage*, Seville, 2004, Balkema, 2004 Taylor & Francis Group, London, pp. 71-78.
- CP32. P. Kapsalas, M. Zervakis, **P. Maravelaki-Kalaitzaki**, E.T Delegou, A. Moropoulou, “NDT Detection of Decay Areas and Evaluation of their Attributes”, In *Proceedings of XXI International CIPA Conference (CIPA 2007)*, Athens, Greece, October 2007, (CD).
- CP33. N. Kallithrakas-Kontos, **P. Maravelaki-Kalaitzaki**, “EDXRF study of Late Minoan metallic artworks”, *International Symposium, Aegean Metallurgy in Bronze Age*, 2008, Rethymnon, I. Tzachili (Ed.), Crete, pp. 297-303, (in greek).
- CP34. **P. Maravelaki-Kalaitzaki**, N. Kallithrakas-Kontos, V. Perdikatsis, “Pigments and terracotta analyses from Hellenistic figurines of Crete”, In *Proceedings of 10<sup>th</sup> International Cretological Conference*, Chania, 2006, Volume A5, Historical Period, Philological Club Chrysostomos, Chania 2011, pp. 247-262.
- CP35. **N. Maravelaki**, G Christodoulakos, “Application of compatible mortars for the restoration of the archaeological museum of Kissamos”, In *Proceedings of the 1<sup>st</sup> National Conference of Building Materials*, 2008, Athens, Technical Chamber of Greece, (CD), (in greek).
- CP36. Galanos A., Doganis I., **Maravelaki-Kalaitzaki P.**, Kallithrakas-Kontos N., Hydraulic Mortars and Plasters at the Ancient Aqueduct of Naxos, Greece, *11<sup>th</sup> International Congress on Deterioration and Conservation of Stone*, 15-20/9/2008, Torun, Poland, pp. 627-634.
- CP37. A. Galanos, I. Doganis, **P. Maravelaki-Kalaitzaki**, N.Kallithrakas-Kontos, Investigation for Durable Cast Stone Mortars for Use in a Marine Environment, *11<sup>th</sup> International Congress on Deterioration and Conservation of Stone*, 15-20/9/2008, Torun, Poland, pp. 1223-1230.
- CP38. P. Kapsalas, **P. Maravelaki-Kalaitzaki**, M. Zervakis, E. T. Delegou, A. Moropoulou, Towards Enriching the Estimation of Stone Degradation Through Computer Vision Analysis, *11<sup>th</sup> International Congress on Deterioration and Conservation of Stone*, 15-20/9/2008, Torun, Poland, pp. 397-406.
- CP39. A. Moropoulou, **N. Maravelaki**, G. Biscontin, Jose Delgado Rodrigues, Joao Manuel Mimoso, Evaluation of consolidation treatments to stones regarding microstructural and mechanical characteristics and response to artificial weathering accelerated tests, *Proceedings International Symposium, Stone consolidation in cultural heritage: research and practice*, Lisbon, PT, Laboratorio Nacional de Engenharia Civil, May 2008, pp. 435-444.
- CP40. M. Tziotziou, E. Karakosta, I. Karatasios, M. Fardis, **P. Maravelaki-Kalaitzaki**, G. Papavassiliou, V. Kilikoglou (2010), Application of <sup>1</sup>H NMR in the hydration monitoring of lime-pozzolan mortars, in: J.Valek, C.Groot, J.I.Hughes (editors), *Proceedings of the 2nd Conference and of the Final Workshop of RILEM TC 203 – RHM, 2nd Historic Mortars Conference HMC2010 and RILEM TC 203 – RHM Final Workshop*, 22-24 September 2010, Prague, Czech Republic, Rilem Publications, 547-554.

- CP41. Anastasia Verganelaki, **Noni-Pagona Maravelaki**, Meral Budak, Calcined clays and limestone as hydraulic binders, *Proceedings 8<sup>th</sup> International Symposium on the Conservation of Monuments in the Mediterranean Basin*, Patra, 31/5 - 2/6/2010, 2013, CD, Volume C, Technologies for damage rehabilitation.
- CP42. P. Kapsalas, **P. Maravelaki-Kalaitzaki**, M. Zervakis, E.T. Delegou, A. Moropoulou, A computer vision framework for accurately extracting corroded areas and establishing the association between the type of corrosion and its extent and morphology, *Proceedings 8<sup>th</sup> International Symposium on the Conservation of Monuments in the Mediterranean Basin*, Patra, 31/5 - 2/6/2010, 2013. CD, Volume C, Methodologies of damage assessment.
- CP43. A. Galanos, I. Doganis, **P. Maravelaki**, "Durable cast stone mortars resistant to a marine environment", in: Ioannou, I., Theodoridou, M. (Eds.), *International Conference on Salt Weathering on Buildings and Stone Sculptures*; 19.10.2011 - 22.10.2011, Limassol, Cyprus, pp. 315-322.
- CP44. Skoutelis Nikos, Stavroulaki Maria, **Maravelaki Noni-Pagona**, "Cultural routes and rehabilitation of the drystone rainwater cisterns of Epano Mirabello region, Crete", *5th International Congress "Science and Technology for the Safeguard of Cultural Heritage in the Mediterranean Basin"*, Istanbul 2011.
- CP45. **Maravelaki-Kalaitzaki P.** (et al.), 2012. Physico-chemical and Mechanical Characterization of Hydraulic Mortars Containing Nano-Titania for Restoration Applications, *4th International Symposium on Nanotechnology in Construction*, NICOM4, Agios Nikolaos, Greece, May 20-22, 2012, (S1.2\_200, CD).
- CP46. **P. Maravelaki**, E. Lionakis, G. Kostakis, "Characterization of hydrated lime-fly ash mortars", *3rd International Conference on Industrial and Hazardous Waste Management* 12-14 September 2012 Chania, Crete, Greece- Book of Abstracts (S30.1, CD).
- CP47. **N. Maravelaki**, E. Lionakis, C. Kapridaki, Z. Agioutantis, A. Verganelaki and V. Perdikatsis, "Characterization of hydraulic mortars containing nano-titania for restoration applications", *12th International Congress on the Deterioration and Conservation of Stone*, 22-26 October, 2012, New York . (<http://hpef.us/conferences/stone-conference>)
- CP48. C. Kapridaki and **N. Maravelaki-Kalaitzaki**, "TiO<sub>2</sub>-SiO<sub>2</sub>-PDMS nano-composite hydrophobic coating with self-cleaning properties for marble protection," *12th International Congress on the Deterioration and Conservation of Stone*, 22-26 October, 2012, New York. (<http://hpef.us/conferences/stone-conference>)
- CP49. 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, International Conference", *Built Heritage 2013, Monitoring Conservation Management*, Milan, Italy, 18-20 November 2013, online proceedings, <http://hoc5.elet.polimi.it/bh2013portal/index2.html>
- CP50. **N. Maravelaki**, A. Verganelaki, V. Kilikoglou, I. Karatasios, C. Kapridaki, Synthesis and characterization of a bio-inspired calcium oxalate-silica nanocomposite for stone conservation, *6th International Congress "Science and Technology for the Safeguard of Cultural Heritage in the Mediterranean Basin"*, Athens, Greece 22nd-25th October 2013.
- CP51. "Synthesis and Characterization of a Calcium Oxalate-silica Nanocomposite for Stone Conservation", A. Verganelaki, N. Maravelaki, V. Kilikoglou, I. Karatasios, I. Arampatzis, K. Siamos, International Conference "*Built Heritage 2013: Monitoring Conservation Management*", 18-20 November, Milano, Italy.
- CP52. Luís Pinho, Chrysi Kapridaki, Maria J. Mosquerab, **Pagona Maravelaki-Kalaitzaki**, "Photoactive, hydrophobic, self-cleaning TiO<sub>2</sub>-SiO<sub>2</sub>-PDMS nanocomposites for building protection", *European Materials Research Society (E-MRS) 2014 FALL MEETING*, September 15-18, Warsaw University of Technology, Poland

- CP53. "SiO<sub>2</sub>-crystalline TiO<sub>2</sub> Photoactive and Hydrophobic Nanocomposites with Application as Self-cleaning Coatings on Buildings", Luís Pinho, Chrysi Kapridaki, Maria J. Mosquerab, **Pagona Maravelaki-Kalaitzaki**, *8th European Meeting on Solar chemistry and photocatalysis: Environmental Applications*, 25-28 June, 2014, Thessaloniki, Greece.
- CP54. "Synthesis and Characterization of a Calcium Oxalate - Silica Nanocomposite for Stone Conservation, **N. Maravelaki**, A. Verganelaki, V. Kilikoglou, I. Karatasios, *IAEG XII Congress 2014 - Engineering Geology for Society and Territory*, 15-19 September 2014, Torino, Italy.
- CP55. "Stabilization of Chrysotile Asbestos via Acid-Treatment and Silylation processes", A. Valouma, A. Verganelaki, G. Teteros, **P. Maravelaki**, E. Gidaracos, *4th International Conference on Industrial and Hazardous Waste Management*, 2-5 September 2014, Chania, Greece.

## 6.6 NON-REFEREED CONFERENCE PROCEEDINGS - FULL PAPERS OR ABSTRACTS) (14)

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- CA1. **Maravelaki-Kalaitzaki P.**, "Environmental impact on stones & mortars from historic buildings: Case studies from Venice, Athens and Crete (2001) Workshop "Environmental Effects on Art-works", pp. 4-5.
- CA2. **Maravelaki-Kalaitzaki, N.**, & Kallithrakas-Kontos, N. (2003). Cinnabar find in Cretan Hellenistic tombs, preservative or cosmetic purposes-4th Symposium on Archaeometry. Hellenic Society for Archaeometry.
- CA3. Skoulikidis, Th., Vassiliou, P., Papakonstantinou, P., Moraitou, A., Zafirooulos, V., Kalaitzaki, M., Spetsidou, P., **Maravelaki, P.**, "Some remarks on Nd:YAG and excimer UV laser for cleaning soiled sulfated monument surfaces", 2004 LACONA I, 1<sup>st</sup> Int. Conference on La-sers in the Conservation of Artworks, 4.-6. October 1995, Heraklion, Crete, Greece.
- CA4. **N. Maravelaki**, A. Galanos, I. Doganis, N. Kallithrakas-Kontos, "Pigmented plasters at the Acropolis of ancient Karthaia", Greece, 5<sup>th</sup> Symposium of the Hellenic Society for Archaeometry, 8-10/10/2008, Athens, Book of Abstracts, O48.
- CA5. **N. Maravelaki** and N. Kallithrakas-Kontos, "EDXRF and FTIR combined studies of archaeological artworks in Crete", TECHNART 2009, Non-destructive and Microanalytical Techniques in Art and Cultural Heritage, Athens, 27-30 April 2009, Book of Abstracts, p. 65.
- CA6. L. Kalogerakis, A. Verganelaki, C. Kapridaki, A. Gotsis, **P. Maravelaki**, "Hybrid TEOS/colloidal silica/TiO<sub>2</sub>/GPTMS composites for stone consolidation", P2-19, 7<sup>th</sup> International Conference – NN10 on Nanosciences & Nanotechnologies, 11-14 July 2010 Ouranoupolis, Halkidiki, Greece, p. 191.
- CA7. C. Kapridaki, **P. Maravelaki**, "Titania-silica sol-gel bactericide coatings on marble", P2-20, 7<sup>th</sup> International Conference – NN10 on Nanosciences & Nanotechnologies, 11-14 July 2010 Ouranoupolis, Halkidiki, Greece, p. 192.
- CA8. P. Kapsalas, M. Zervakis, **P. Maravelaki-Kalaitzaki**, E.T. Delegou, A. Moropoulou; "Automated Detection of Robust Morphology Regions to Quantify Corrosion Damage &

Identify its Type, Application of Multivariate Analysis and Chemometry to Cultural Heritage and Environment", CMA4CH Mediterranean Meeting, 26-29 September 2010, Taormina, Italy.

- CA9. **P. Maravelaki**, L. Kalogerakis, A. Verganelaki, C. Kapridaki, A. Gotsis, "Evaluation of hybrid TEOS/colloidal silica/TiO<sub>2</sub>/GPTMS composites as stone consolidants", EuroNanoForum 2011, 30<sup>th</sup> - 31<sup>st</sup> May, Budapest, 2011.
- CA10. **(invited) P. Maravelaki**, E. Lionakis, C. Kapridaki, A. Verganelaki, "Physico-chemical characterization of hydraulic mortars containing nano-titania for restoration applications", 8<sup>th</sup> International Conference on Nanosciences & Nanotechnologies – NN11 'Ioannis Vellidis' Congress Centre, 12-15 July 2011 Thessaloniki, Greece.
- CA11. **Maravelaki-Kalaitzaki P.** (et al.), 2012. "Hybrid TEOS/colloidal silica/TiO<sub>2</sub>/GPTMS composites for stone consolidation", 4<sup>th</sup> International Symposium on Nanotechnology in Construction, Agios Nikolaos, Greece, May 20-22, 2012.
- CA12. "Hydraulic mortars with nano-titania for joining sandstone architectural members of the Acropolis Monuments", Study: **P. Maravelaki**, Z. Agioutantis, E. Lionakis, Ch. Kapridaki, A. Verganelaki, Technical University of Crete, Coordination-Implementation: E. Sioumbara, E. Aggelakopoulou, E. Fragiadaki, G. Frantzi, The Acropolis Restoration Service Athens, 6<sup>th</sup> International Meeting for the Restoration of the Acropolis Monuments, Athens, 4<sup>th</sup> - 5<sup>th</sup> October 2013
- CA13. **(invited) Pagona-Noni Maravelaki**, C. Kapridaki, A. Verganelaki, Novel hybrid nanocomposites for building materials' strengthening and protection, 10<sup>th</sup> International Conference on Nanosciences & Nanotechnologies, 9 - 12 July 2013, Thessaloniki, Greece.
- CA14. **(invited) M. Theodoridou**, E. Charalambous, I. Ioannou, **P. Maravelaki**, "The use of nano-additives in composite construction materials", 10<sup>th</sup> International Conference on Nanosciences & Nanotechnologies, 9 - 12 July 2013, Thessaloniki, Greece.

## 6.7 Partent (1)

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1. **Maravelaki P**, Verganelaki A, et al (2011) Method for the production of nano-oxalic silicon gel with application on building materials. Industrial Property Organization. No. 1007392. 54.

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## 7. PROFESSIONAL & EDUCATIONAL SERVICE ACTIVITIES

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### 7.1 REFEREE - INTERNATIONAL PEER REVIEW JOURNALS

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1. Cement and Concrete Research
2. Water Air and Soil Pollution
3. Thermochemica Acta

4. Building and Environment
5. Surface and Interface Analysis
6. Progress in Organic Coatings
7. Analytica Chimica Acta
8. Applied Organometallic Chemistry
9. Construction and Building Materials
10. Cement and Concrete Composites
11. Materials Science and Engineering B
12. Environmental Science and Pollution Research

## **7.2 REFEREE - RESEARCH PROPOSALS**

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**Cyprus Research Promotion Foundation:** Involved in the review and evaluation of a research proposal in the field of characterization of monumental building materials.

## **7.3 INVITED PUBLIC PRESENTATIONS**

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13. Invited participation in the Workshop “Conservation of Historic Stone Structures, Working Group I on Mechanisms and Rates of Stone Damage”, Dahlem University, Dahlem, 3-8 March 1996.
14. Invited participation as external expert of the relevant G7 COST Action, Bucharest, 19-21 January 2001.
15. Invited presentation in the Workshop on “Environmental effects on artworks” COST G7 with title: “Environmental impact on stones and mortars from historic buildings: case studies from Venice, Athens and Crete”, Herakleion 18-21 October 2001, Book of abstracts, COST G7.
16. Invited presentation in the interdisciplinary meeting of the Committee for the Preservation of the Acropolis Monuments, with title: “Laser cleaning of marble: procedure and evaluation of the effects”, Athens, 2001.
17. Invited presentation in the interdisciplinary meeting of the IGME-ICOMOS, with title: “Encrustation on Pentelic marble: cleaning and evaluation with laser assisted techniques”, Athens, 2001.
18. Invited presentation in the Workshop on “New technologies for the preservation of cultural heritage”, with title: “Innovative technologies for characterization and cleaning of encrustation”, Fraunhofer-Institut für Silicatforschung, Bronnbach Branch, Bronnbach, 2001, Abstracts from the Greek Participants, General Secretariat for Research and Technology, BMBF-DLR, pp. 10-12.
19. Invited presentation, 7<sup>th</sup> International Conference on Non-Destructive Testing and Microanalysis for the Diagnostics and Conservation of Cultural and Environmental Heritage with title “Innovative techniques for the characterization of encrustation on Pentelic marble, from the Parthenon”, Antwerp, Belgium, 2-6 June 2002.
20. P. Maravelaki, "Novel consolidant, protective and cleaning agents based on nano-technology for monument conservation", pages 16, 2009, Tehran, 20/12/2009, Research Institute for the Iranian Cultural Heritage Handicrafts and Tourism

- Organization (ICHHTO), “Esfahan University of Art”, Esfahan, (14/12/09), and “Parsa Pasargadae Research Foundation” Pasargadae (19/12/09).
21. “Novel consolidant, protective and cleaning agents based on nano-technology for monument conservation”, University of Cyprus, Civil & Environmental Engineering Department, 14/3/2011, Nicosia, Cyprus.
  22. "Remedial materials and techniques of past treatments: the case of the archaeological Museum of Kissamos", Università IUAV di Venezia, 28/4/2011, Lecture, Erasmus project.
  23. "Innovative cleaning, consolidation and protection materials based on nanotechnology for the monument conservation", Università IUAV di Venezia, 28/4/2011, Lecture, Erasmus project.
  24. Invited presentation “Hydraulic mortars with nano-titania for joining sandstone architectural members of the Acropolis Monuments”, Meeting No. 4, Committee for the Preservation of the Acropolis Monuments, Athens, 19-5-2011.
  25. "Physico-chemical characterization of hydraulic mortars containing nano-titania for restoration applications", 8<sup>th</sup> International Conference on Nanosciences & Nanotechnologies – NN11 'Ioannis Vellidis' Congress Centre, 15 July 2011, Thessaloniki, Greece.
  26. “Novel hybrid nanocomposites for building materials’ strengthening and protection”, 10<sup>th</sup> International Conference on Nanosciences & Nanotechnologies, 11 July 2013, Thessaloniki, Greece.

## 7.4 COLLABORATIONS

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1. Pursuant to the official invitation from the Research Institute for the Iranian Cultural Heritage Handicrafts and Tourism Organization (**ICHHTO**), the Professor Dr. Fani Mallouchou-Tufano and the Associate Professor Dr. Pagona-Noni Maravelaki visited Iran from 13/12/2009 up to 21/12/2009. During their visit they gave lectures at the “Isfahan University of Art” in Isfahan (14/12/2009), at the “Research Foundation Parsa Pasargadae” in Pasargadae, and at the “The Research Center for Conservation of Historical-Cultural Works and Objects” in Tehran, Iran, with topics relative to the restoration and conservation of monuments. In particular, case studies concerning the monument restoration of the Acropolis monuments, and other important monuments of Greece, such as the Sikion Theatre, the Olympia archaeological site, the new Museum of Chalkida, etc. Furthermore, the recent advances of the nanotechnology for specific applications in the conservation of materials were presented and discussed. The Iranian scientists expressed particular interesting on the restoration and conservation of the Sassanid period (3rd century AC up to 7<sup>th</sup> century PC) monuments in the cities of Firuzabad and Bishapur, including rock reliefs, Temple, Palace and Castle.
2. University of Cyprus, Civil & Environmental Engineering Department, Assistant Professor I. Ioannou, 2011-, Nicosia, Cyprus, Erasmus Agreement, 2011-2014.
3. University Ca Foscari of Venice (IVENEZIA01), Prof. Guido Bisconti and Associate Prof Elisabetta Zendri, Dipartimento di Scienze Ambientali Sede: Polo scientifico via Torino - Informatica e laboratori di Scienze Santa Marta - Dorsoduro 2137 - 30123 (VE), Erasmus Agreement, 2011-2014.
4. Università IUAV di Venezia, Laboratorio di Analisi dei Materiali Antichi, Prof. L. Lazzarini, 2011-παρόν.



5. YSMA, The Acropolis Restoration Service, 2010-present.
6. Universidad de Cadiz, Spain, María Jesús Mosquera Díaz, Departamento de Química-Física, Facultad de Ciencias, Erasmus Agreement, 2013-2014.

## 7.5 LANGUAGES

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Greek (mother language), English (very well), Italian (very well), French (basic knowledge), Spain (basic knowledge).

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## 8. FUNDED PROJECTS (Principal or Co-Principal Investigator and/or Coordinator)

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- 2016: “Kommos Archaeological Site / General Condition Assessment”, Institute for Aegean Prehistory Study Center for East Crete INSTAP-SCEC S.A.”, €10,000.  
Coordinator
- 2015: First prize at the contest “The Oslo Opera House – Condition analysis and proposal for protection and maintenance of exterior marble”, organized by Statsbygg, Norway. The Oslo Opera House is a listed building of approximately 23 000 m<sup>2</sup> Carrara Marble that decorates the external facades and roof of the Opera. In this project, Betong Consult AS, NanoPhos SA, the Laboratory Materials and Methods for Cultural Heritage of the Politecnico di Milano and the Surfa Products Scandinavia AS, also collaborate. € 48,000, 2015-2016.  
Coordinator
- 2015: Restoration of the Venetian Fortress, Chania, Crete: Study of the construction and repair materials and methods, Greek Ministry of Culture, (€4,000.00).  
Coordinator
- 2014-2011: Bioinspired nanocomposites for the strengthening of construction materials, "European Territorial Cooperation", NSRF, Greek General Secretariat for Research and Technology (GRST), (€516,160.00).  
Coordinator
- 2014-2011: Sustainability and Compatibility of advanced materials and technologies for the protection of cultural heritage monuments: Development of investigation criteria and methodologies – COMASUCH», [(€600,000.00), European Regional Development Fund and national resources, Thales Project.  
Principal Investigator
- 2013-2010: Assessment of mortars with nano-additives for the re-adhesion of porous fragments from the Acropolis, Athens, monuments. The Akropolis Restoration Service, (€6,000.00).  
Coordinator
- 2013-2009: Evaluation of chemical compatibility and improvement of stone consolidants with nano-technology. “HRAKLEITOS II”, the European Union-European Social Fund (ESF) & National Sources. (€45,000.00).  
Coordinator

- 2012: Physico-chemical analysis of mortars from ancient city of Polyrrenia Chania, Crete, Greek Ministry of Culture, (€4,692.64).  
Coordinator
- 2012-2011: Documentation, Principles and Materials Research for the Conservation and Restoration of the Ancient Monuments of Iran, Technical University of Crete, (€6,000.00).  
Coordinator
- 2011-2009: Novel nanocomposites for stone consolidation, Technical University of Crete, (€15,000.00).  
Coordinator
- 2010-2009: Restoration of the ancient Aptera Theatre, Conservation-Restoration of monuments, Regional Operational Program of Crete, (€14,995.00).  
Coordinator
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Principal Investigator
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Principal Investigator
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- 1997-1996: Assessment of the consolidation products for the conservation of porous stones from the Rhodes fortifications, National Technical University of Athens, Section of Materials and Engineering, Regional Operational Program of Rhodes.  
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