



**GLOBALSTONE**  
c o n g r e s s 2 0 2 3

7th EDITION

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MOSTEIRO DA BATALHA  
BATALHA, PORTUGAL

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18TH - 23RD OF JUNE 2023

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**ASSIMAGRA**  
MINERAL RESOURCES OF PORTUGAL



CLUSTER  
PORTUGAL  
MINERAL  
RESOURCES



UNIVERSIDADE  
DE ÉVORA

## GLOBAL STONE COGRESS 2023 | BATALHA, JUNE 18 - 23

### Program Overview

#### Sunday, June 18th

- 17:30 Gathering in Mosteiro da Batalha and departure to Porto de Mós
- 18:00 - 20:00 Reception Event & Sunset Drinks at Porto de Mós Castle
- 20:30 Return to Batalha

#### Monday, 19th June

- 08:30 - 09:00 Registration
- 09:00 - 09:45 Opening Session
- 09:45 - 10:45 **Keynote speaker - Siegfried Siegesmund**  
**Marble Decay: Phenomena, Processes and Diagnostics**
- 10:45 - 11:00 N. Careddu, L. Pia, O. Pandolfi, N. Santoro, S. Düндar - Study for the implementation of an integrated monitoring system in marble quarries
- 11:00 - 11:15 A. Tugrul, M. Yilmaz, S. Akgündüz<sup>1</sup>, G. Dursun<sup>1</sup>, E. Avci, H. Elçi - The importance of structural, sedimentological and geomechanical studies in a marble quarry
- 11:15 - 11:30 F. Sitzia, C. Lisci, P. Moita, S. Bottura-Scardina - Colour fading and changing in light-sensitive minerals exposed to UV rays
- 11:30 - 12:00 Coffee-break**
- 12:00 - 12:15 J. V. Lisboa, J. C. Sousa, J. F. Máximo, A. Oliveira, J. F. Suarez, B. Barros, J. F. Rodrigues, J. M. Plastov, J. L. Lobón - Ornamental Stones from the Cunene Anorthosite Complex, Angola: the "Negro" Lithotype Anorthosite and the Red Granites
- 12:15 - 12:30 J. M. F. Carvalho, J. V. Lisboa, A. Pereira - Ornamental Stones within the INSPIRE Directive infrastructure: the need for change
- 12:30 - 12:45 J. V. Lisboa, L. Duarte, J. F. Máximo, A. Oliveira, J. F. Suarez, J. F. Rodrigues, J. M. Plastov, J. L. Lobón - Ornamental Stones Variety in Namibe, Angola: Metagreywackes and Migmatites, Granites and Marbles
- 12:45 - 13:00 M. H. B. O. Frascá, N. F. Castro - Exotic stones a milestone in natural stones

13:00 - 13:15 B. Schouenborg, B. Grelk, D. West, P. Blasi - How testing and quality assurance can make marble a durable option for exterior cladding

13:15 - 13:30 I. Rondão, V. Francisco - SMARTSTONE - Building the Stone of the Future

**13:30 - 15:00 Lunch**

15:00 - 19:00 Technical Visit – Julipetra factory [Guided Visit]

19:30 Batalha

## Tuesday, 20th June

08:30 - 08:45 A. R. F. Custodio, Q. C. Gomes, D. O. Caverzan, A. R. de Paula - The geographical indication as a success indicator in the socioeconomic development incentive of the local productive arrangement in the ornamental stones sector in the northwest region of Espírito Santo

08:45 - 09:00 A. G. Costa - Portuguese limestones and cultural heritage applications and patterns of degradation through time

09:00 - 09:15 J. Wu, Y. Ren, A. Candeias, X. Yang, H. Wu, M. Xu - A study of the stone landscape technology in Suzhou's Canglang Pavilion represented by Taihu stone and Yellowstone

09:15 - 09:30 N. Moreira, J. Rosa, J. F. Santos, S. Ribeiro - Trigaches marbles (São Brissos, Beja, Portugal): petrographic and geochemical characterization of a historical dimension stone

09:30 - 09:45 R. Varró, P. Görög - Investigation of the collapse of a four-span masonry arch bridge, a case study from Hungary

09:45 - 10:00 V. Cárdenes - Review of the impact of climate change in the durability of roofing slates

**10:00 - 10:30 Coffee-break**

10:30 - 11:30 **Keynote speaker - Gurmeet Kaur**  
**IUGS Heritage Stones and UNESCO Stone-Built World Heritage Sites**

11:30 - 11:45 R. Bruno - The original ornamental stones and the conservation of the monumental cultural heritage

11:45 - 12:00 J. P. Monticelli, P. Hino, M. G. Garcia, R. P. Ribeiro - Towards assessment of climbing geosites in the Corumbataí Geopark Project - São Paulo/Brazil

12:00 - 12:15 V. Cetean, T. Filipciuc, R. Fărnoagă, E. Tudor, D. Ion, S. Lörincz, G. Dincă - Top 12+1 ornamental stones from Romania with National and Global Heritage value

12:15 - 12:30 V. Pires, C. Lisci, F. Sitzia, J. Mirao, T. Alves, P. Faria - Wet and dry conditions influence on natural stone cladding performance with dowel-pin anchor system

12:30 - 12:45 L. Gouveia, A. Mateus, F. Gaspar, J. Fernandes, L. Oliveira, A. Vieira, D. Pereira - Continuous additive manufacturing processes through the use of lime waste sludge (extrusion and binder jetting)

12:45 - 13:00 A. Quintas, C. Filipe - Heritage and history of the marble industry, 10 years of the Estremoz Anticline study (Portugal)

**13:00 - 14:30 Lunch**

15:00 - 18:30 Technical visits – Solancis factory and Marfilpe quarry [Guided Visits]

19:30 Batalha

20:30 Congress Dinner

### **Wednesday, 21st June**

08:30 - 08:45 R. Santos, J. Salgado, A. Silva - Limestone processing sludge as a secondary raw material for innovative earthenware manufacturing – The LIFE4STONE study case

08:45 - 09:00 C. M. Souza, E. S. C. Freitas, L. H. Xavier, R. C. Ribeiro - Circularity pathways to the material recovery from Bege Bahia dimension stone

09:00 - 09:15 F. Aljedi - Research on how to recycle side blocks in granite factories to change the wastes into useful products

09:15 - 09:30 S. Leinonen - Soapstone - Ways recycling waste rock and minerals

09:30 - 10:00 E. Martínez, F. Cortes - Transition to a greener industry through circular economy processes

10:00 - 10:15 I. Almeida, A. Silva, C. Rabadão - Towards sustainability goals in the Portuguese ornamental stone industry's 4.0 ecosystem supply chain

10:15 - 10:30 M. Almeida, A. Amado - Circular economy in Stone industrial symbioses with ceramics

10:15 - 10:30 P. Marone - Proposal of a road map for the sustainability of natural stone

**10:30 - 11:00 Coffee-break**

11:00 - 12:00 **Keynote speaker - José Delgado Rodrigues**  
**Stone in Architecture: Learning from Cultural Heritage Assets**

12:15 - 12:30 J. Carvalho, C. Carvalho, L. Lopes, A. Silva, C. Santos, L. Sousa, R. Martins, C. Marques - Natural Stones from Portugal: proposal for harmonizing commercial names

12:30 - 12:45 M. Rucha, B. Sena da Fonseca, A.P. Ferreira Pinto, S. Piçarra - Searching for multifunction products for natural stones

- 12:45 - 13:00 A. Silva, C. Claro, N. Cristo, C. Marques - The Portuguese natural stone georeferencing approach through the Stone4.0 Age Project
- 13:00 - 13:15 R. Silva, N. Castro, B. Piacesi, R. Ribeiro, J. Santos - Investigation of the effects of fire on stone materials: the Rio de Janeiro case
- 13:30 - 14:15 Departure to Alcanede
- 14:15 - 15:00 Lunch at Fravizel**
- 15:00 - 18:30 Visit to Fravizel engineering and metalworking company factory and Serra de Aire Dinosaur Footprints Natural Monument
- 19:15 Batalha

### Thursday, June 22th

- 08:00 Departure from Vila da Batalha to ExpoSalão
- 08:30 - 08:45 N. Almeida, I. Ferreira - BIM-based platform for ornamental stone supply chain
- 08:45 - 09:00 A. Silva, A. Cardoso - BIM-based supply chain in AEC: new challenges for stone companies
- 09:00 - 09:15 I. Frazão, J. Frazão, J. Frazão - Decarbonization evolution in the stone sector
- 09:15 - 09:30 A. Pata, A. Silva - Risk assessment and management in machine manufacturing for the stone industry
- 09:30 - 09:45 K. Laskaridis, A. Arapakou, M. Patronis, C. Papatrechas, I. Kouseris - Promotion of ornamental stones quarried in the North and South Aegean regions of Greece used in local architecture
- 09:45 - 10:00 G. Signori - Sustainability and durability of urban stone paving: a proposal for an innovative approach for design, conservation and redevelopment works
- 10:00 - 10:15 **Keynote speaker - Isabel Almeida**
- The European Green Deal and the Dimension Stone Industry**
- 10:15 - 10:45 Coffee-break**
- 10:45 - 11:15 **Keynote speaker - Guta Moura Guedes**
- First Stone Project**
- 11:15 - 12:15 **Keynote speaker - Hervé Beaudouin**
- Materials for stories**
- 12:15 - 13:15 **Keynote speaker - Pierre Bidaud**
- Stone by default**

13:15 - 13:30 Closing ceremony and venue announcement for the VIII Global Stone Congress

13:30 - 15:00 Lunch Hosted by ExpoSalão, Batalha

15:00 - 18:30 Visit to ExpoSalão STONE Ibérica EXPO

**Friday, June 23th**

**Touristic visit**

09:00 - 09:30 Batalha - Fátima

09:30 - 10:45 Fátima Sanctuary Guided Visit (Building Stones)

10:45 - 11:00 Fátima - Serra de Aire Dinosaur Footprints Natural Monument

11:00 - 12:00 Serra de Aire Dinosaur Footprints Natural Monument Guided Visit

12:00 - 13:00 Serra de Aire Dinosaur Footprints Natural Monument - Nazaré

**13:00 - 14:45 Nazaré (Free Lunch)**

14:45 - 15:00 Nazaré - Alcobaça

15:00 - 17:00 Alcobaça Monastery Guided Visit

17:00 - 17:30 Alcobaça - Batalha

## POSTER SESSION: JUNE, 19 - 21 (08:30 - 14:00)

### CLOISTERS OF THE MONASTERY OF BATALHA

#### POSTER PRESENTATIONS

1. A. Amaral, M. Ferreira - Digital Transformation of the Natural Stone Sector
2. A. Espín, M. Reyes, A. Gil - Selective and sustainable evaluation of ornamental rock resources by obtaining a three-dimensional depth model based on the application of seismic methods and data mining techniques
3. A. Massano, G. Martins, A. Vieira, A. Mateus - How can paper be produced from mineral sources instead of cellulose?
4. A. Massano, G. Martins, M. Franco, D. Sousa, J. Fernandes, A. Mateus - 3D Printing of Composites Based on Residues of Calcium Carbonate from Quarries
5. A. Mozer, N. Castro, K. Mansur, R. Ribeiro - Main deterioration patterns found in Lioz Limestone at Rio de Janeiro
6. A. Silva, A. Cardoso - Technology Paths towards Cooperation Ecosystems - The Portuguese Stone Sector
7. C. Baleia, C. Baleizão, J. Farinha - Nanostructured Functional Stone Coatings
8. C. D. Henriques, D.R. Siva, P.A. Amaral, C.A. Silva - Monitoring of a Natural Stone Cutting CNC Machine: Early Insights on Internet of Things applications for Improved Efficiency and Sustainability in the Stone Industry
9. C. Pinto, J. Fonseca - Structural use of high-strength granites mechanical behaviour and applications
10. C. Santos, C. Marques, N. Cristo - Sustainability in the Extractive Industry of Ornamental Stone in Portugal: Planning and Management of the Territory
11. C.E. Cremonini, J.C. Vasco, C. Capela, A. Silva, and M.C. Gaspar - INDUSTRY 4.0 Concept in the Portuguese Natural Stone Cluster
12. C.E. Cremonini, J.C. Vasco, C. Capela, A. Silva, M.C. Gaspar - Digital Twins and the Ornamental Stone Industry: Key Factors
13. D. Papp, V. Cetean - Geoheritage elements between exploitation and conservation: case studies from Romania
14. D. Sousa, P. Amaral - Stone Powder Composites for Additive Manufacturing
15. E. Alvarez-Areces, J. Suárez, J. Martínez, P. Amaré, J. Baltuille - First inventory of historical quarries associated to the architectural heritage of Andalusia (Spain)
16. E. Alvarez-Areces, M. Agudo - Strategies and exploitation of the Paramos Miocene limestones in the construction of early medieval hispanic buildings
17. E. Alvarez-Areces, M. Agudo, A. Alonso-Jiménez, R. Santos, M. Rozas - Boñar Stone (León, Spain) as a construction resource, historical heritage and prospects
18. G. Camara, E. Santos, A. Gualandi, L. Silveira, M. Neves, C. Chiodi Filho, N. Castro - Circular economy and the use of different ornamental stones wastes as a source of soil fertilization

19. G. Signori, A. Angheben - Porphyry: a precious stone with exceptional expertise at the service of urban design. now, a new tool is available to help design
20. Hélio Jorge - Additive manufacturing of natural stone-based materials: assessment of binder-jetting capabilities
21. I. Almeida, A. Silva - Developing a Conceptual and Innovative Framework for Circular Economy in the Ornamental Stone industry.pdf
22. J. Carvalho, T. Heldal, K. Laskaridis - The Eurolithos project and its main outputs
23. J. Góis, L. Lopes, R. Martins - Sustainability in Dimension Stone Industry
24. J. Madrinha, N. Moreira, L. Lopes, F. Sitzia, J. Mirão, A. Dionísio, S. Neves - Structural, physical and compositional proprieties analysis of marbles in a quarry face: a study case application on Estremoz Anticline
25. J.A. Álvarez, A.J. Sánchez, J.A. Valido García – The Use of Volcanic Stone in the Architectural Heritage of the Island of Tenerife (Canary Islands)
26. L. Dias, S. Martins, H. Hashim, A. Carrapiço, F. Sitzia, V. Pires, M.R. Martins, J. Mirão, P. Barrulas - Innovative solutions to improve Building Stone durability
27. M. Reyes, A. Espín, A. Gil - Development of a methodology based on non-destructive methods applied to the characterization and research of historical heritage
28. Ö. Boso Hanyali, A. Tuğrul, G. Altuğ, S. P. Çiftçi Türetken, S. Yılmaz Şahin, M. Yılmaz - Investigation of Consolidation of Limestones Used in Historical Buildings in Istanbul by *Myxococcus xanthus* bacterial strain
29. P. Adão, M. Calado, L. Alves, L. Côrte-Real, M. Guedes, R. Baptista, R. Bernardino, S. Bernardino, M. Campos, M. Gil - Development of algal polysaccharide films hardened with processed stone sludge
30. P. Afonso, A. Azzalini, L. Lopes, P. Faria, P. Mourão, R. Martins, V. Pires - Application of resinous binders with incorporation of carbonated sludges from the dimension stone industry in the production of stone composites
31. R. Lobarinhas, G. Paneiro, A. Dionísio - High temperature impact on several Portuguese limestones
32. R. Ribeiro, N. Castro, R. Silva - Mineral Alterations Caused by Lightning in the Christ of the Redeemer Surface, Rio de Janeiro, Brazil
33. R. Tavares, T. Carvalho, F. Gaspar, J. Fernandes, A. Vieira, J. Caetano, A. Mateus - Production Process Based on Powder Bed Methods by DSPD
34. S. Monteiro, M. Jorge, N. Oliveira, M. Alves, A. Veiga, A. Silva - Qualitative analysis of the limestone waste potential from the Serra de Aire e Candeeiros quarries
35. S. Monteiro, M. Jorge, M. Heleno, N. Oliveira, M. Alves, A. Veiga, A. Silva - Sustainability study of limestone quarry waste into value-added products: PCC and GCC
36. V. Cárdenes - The Role of the IUGS Heritage Stone Subcommittee on the preservation of geological legacy
37. V. Francisco, A. Fabre - Digitalization in the mineral resources industry: challenges and new development strategies
38. V. Pires, F. Sitzia, J. Mirão, L. Lopes, L. Dias, S. Neves - Marble façades structural decay due to bowing: a comprehensive review



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