

Monday, July 8, 2024

Conference Room Pegaso

Opening Ceremony: 8.15 – 8.30

Chairs: *G. Ferro, S.P. Shah, M.S. Konsta-Gdoutos, K. Sobolev*

Plenary Lectures: 8.30 – 10.30

Chairs: *K. Sobolev, G. Ferro*

Carbon Conscious Concrete and Nanotechnology

by *S.P. Shah*

The Path to Decarbonization Through Nanotechnology – Achieving

Carbon Net-negative Concrete

by *M.S. Konsta-Gdoutos*

3D Printed Cement-based Nanocomposites

by *F. Sanchez*

Break: 10.30 – 11.00

Nanomaterials in Construction

Chairs: *F. Sanchez, J. Olek*

- 11.00** ¹Effects and mechanisms of nanosilica on the properties of supersulfated cement, by **P. Hou**
- 11.30** ²Nanomaterials advancements: probing environmental sustainability of alumina nanofiber dispersion for ultra high performance concrete, by *D. di Summa, E. Cuenca, N. De Belie, L. Ferrara*
- 12.00** Enhancing cement paste and mortar durability with nanomaterials: a comparative study of carbon nanotubes and nanometakaolin, by *H. Lee, S. Srinivasan, R. Ferron*
- 12.20** A Commercially Scalable Method for Integrating Carbon Nanotube-Nano-Alumina Hybrid Materials into Advanced Construction Materials, by **R. Prada Silvy, D. Arthur, P. Danoglidis, M.S. Konsta-Gdoutos**

Lunch: 12.40 - 13.30

Nanoparticles and Nanostructures

Chairs: *K. Sobolev, R. Ferron*

- 13.30** ³C-S-H seeds: new insights on pore structure refinement, by **N. Garg**
- 14.00** Functionalization of Nano-materials for better dispersion, by **A. Tagnit Hamou**
- 14.20** Cement-Based composites containing functionalized carbon nanomaterials, by **L. Lavagna, D. Suarez-Riera, C. Amata, M. Pavese**
- 14.40** Development of core-shell nanostructures towards tailoring the rheological and shielding properties of 3D printed concrete, by **P. Sikora, K. Cendrowski, K. Federowicz, A.M. El-Khayatt, H.A. Saudi, M. Chougan, M. Abd Elrahman**

Break: 15.00 – 15.20

Monday, July 8, 2024

Advanced Characterization Techniques and Tools at the Nanoscale

Chairs: *M. Liebscher, N. Garg*

- 15.20** Mechanical resilience in roman reactive marine concrete measured by an innovative arc- fracture test, *by M.D. Jackson, P.F. Brune, C.A. Weiss, Jr., J. F. Burroughs, B.P. Songer, D.A. Scott*
- 15.40** Optimizing concrete performance: Influence of carbon nanotubes dispersion techniques, *by E.D. Reis, F. Gatuingt, F.S. Jacques Poggiali, A.C. da Silva Bezerra*
- 16.00** Nanomechanical testing of Gamma-irradiated building composites, *by J. Němeček, L. Procházka, M. Keppert, P. Halodová, J. Němečková, J. Němeček*
- 16.20** Electrical Property Measurements of Fiber-Reinforced Cementitious Composite Enhanced with Graphene Nano-Platelets, *by H. Liu, A. Deshmukh, N. Salowitz, J. Zhao, K. Sobolev*

Roundtable Discussion

- 16.40** Challenges of using PLC Cement Blends
Moderator: *C.A. Weiss, Jr.*

Banquet: 19.00 - 21.00

Barbeque 4 Point Sheraton Seadeck

Tuesday, July 9, 2024

Conference Room Pegaso

Plenary Lectures: 08.20 - 10.20

Chairs: *S.P. Shah, M.S. Konsta-Gdoutos*

Impact of Nanoparticles on the Durability of Concrete

by *J. Olek*

Metadynamics Atomistic Simulations of the Cement Paste Degradation Mechanisms

by *R. Pellenq*

Nanotechnology in Construction: 20 Years of Continuous Development

by *K. Sobolev and P. Bartos*

Break: 10.20-10.40

Carbon Neutral Materials and Renewable Energy Technologies

Chairs: *L. Ferrara, J. Němeček*

- 10.40** Electronic thermoelectric effect and temperature sensing performance of continuous doped carbon nanofilaments integrated within geopolymer- based concrete, by *G. Karalis, M. Liebscher, J. Zhao, T. Köberle, V. Mechtcherine*
- 11.00** Constructing solutions using cement-based materials for energy harvesting and storage, by *J. Dolado*
- 11.20** Tunable Thermal Properties of e-Conducting Concrete for Energy Conversion, Storage and Dissipation, by *M. Maglogianni, P. Danoglidis, M.S. Konsta-Gdoutos*
- 11.40** The role of graphene-based nanomaterials for enhancing CO₂ uptake and mineralization in engineered concrete, by *P. Danoglidis, M. Margas, M.S. Konsta-Gdoutos*
- 12.00** The use of perovskite materials for photocatalytic reduction of CO₂, by *M. Lopez, K. Sobolev*

Lunch: 12.20-13.20

Carbon Allotropes in Nanomodified Concrete

Chairs: *J. Zhao, C.A. Weiss Jr.*

- 13.20** 3D Printed cement-based composites modified with graphene oxide, by *F. Sanchez, L. Brown, E. Byrum, C. Lee*
- 13.40** Coarse-grained monte Carlo simulations for geopolymer nucleation on graphene-based nanomaterials, by *M. Izadifar, N. Castrillon Valencia, N. Ukrainczyk, E. Koenders*
- 14.00** Templating Effect of Graphene Nanoplatelets on Synthetic Calcium-Silicate-Hydrate, by *H. Alkhateb, W. Elmahmoud, A. Al-Ostaz, S Nouranian, M. Ucak-Astarliogluc, C.A. Weiss, Jr.*
- 14.20** Graphene oxide nanoribbons for high early-strength cement concrete, by *S. Iffat, F. Matta, J. Meany, J. Gaillard, M. Baalousha, M. Elvington*

Break: 14.40 – 15.00

Tuesday, July 9, 2024

Microstructure and Durability

Chairs: *F. Matta, M. Maglogianni*

- 15.00** Effect of attapulgite nanoclay on the strength and durability of 3D printed concrete elements, *by S. Kaushik, **M. Sonebi**, G. Amato, A. Perrot, U. Kumar Das*
- 15.20** Improving the resistivity of seawater-mixed concrete with the inclusion of nanoparticles and supplementary cementitious materials, *by **S. Rathnarajan**, P. Sikora*
- 15.40** Exploring Different Substitution Rates of Recycled Construction and Demolition Waste in Building Applications, *by **D.D. Suarez-Riera**, D. Falliano, L. Lavagna, M. Pavese, G.A. Ferro, L. Restuccia*
- 16.00** Understanding the impact of major seawater ions on the chloride transport in cement paste: A molecular dynamic study, *by **U. Hayat**, Ming-Feng Kai, J.-G. Dai*
- 16.20** Impact of nanosilica admixtures on strength and durability of concrete produced under field and lab conditions, *by **A. Castillo**, J. Olek, M. Velay-Lizancos*

Roundtable Discussions (In Parallel Sessions)

16.40 Low Carbon Concrete Materials

Moderator: *M.S. Konsta-Gdoutos*

16.40 Advanced Characterization Techniques for Cementitious Nanocomposites

Moderator: *F. Sanchez*

Wednesday, July 10, 2024

Conference Room Pegaso

Plenary Lecture: 08.40 – 09.00

Chair: *F. Sanchez*

RILEM – Nanotechnology in Construction Materials

by *L. Ferrara*

Smart and Multifunctional Concrete

Chairs: *S.P. Shah, P. Hou*

- 09.00** Effect of temperature on the self-sensing behavior of carbon nanotubes/cement composites, by **O. Mendoza Reales**, by *T. Carvalho dos Santos, M. Macedo Paiva, P. de Almeida Carísio, A. Paiva de Souza Martins, F. Mamede Pereira Gomes, R. D. Toledo Filho*
- 09.20** Self-sensing concrete composites through incorporation of carbon nanotubes coated PE fibers for crack-formation and crack-width monitoring applications, by **A. Bashiri Rezaie**, *M. Liebscher, G. Airom, V. Mechtcherine*
- 09.40** Unveiling Trade-offs of electrical conductivity and mechanical performance in nanomodified UHPC, by **N. Soliman**, *D. Garcia, P. Martinez, A. Omran*
- 10.20** Production and investigation on the piezoelectric properties of self-sensing cement-based composites with reduced graphene oxide, by **D.A. Triana-Camacho**, *A. D'Alessandro, A. Meoni, E. García-Macías, J. Quintero-Orozco, F. Ubertini*

Break: 10.40-11.00

- 11.00** Cement mortar incorporating electrochemically exfoliated graphene: the study of the dielectric properties, by **M. Safuta**, *C. Valentini, A. Ciesielski, P. Samorì*
- 11.20** Sustainable Urban Heat Island Mitigation with Carbonated Aggregate-Based Cement Composites, by **G. Goracci**, *E. Saeed, J. Dolado*
- 11.40** Corrosion sensing properties of carbon black-based cementitious smart coating, by **G. Milone**, *M.C. Alonso, Ch. Vlachakis, J.M. Tulliani, A. Al-Tabbaa*
- 12.00** Bifunctional organosilicon compounds as concrete modifiers, by **J. Karasiewicz**
- 12.20** Microstructural optimization of an engineered cementitious-based material for process and product innovations, by **D. Falliano**, *L. Restuccia, G. A. Ferro*
- 12.40** Experimental study on the cracking behaviour of cement mortar containing nano-metakaolin by **Y. Fan**, *Q. Li, H. Chen, S.P. Shah*

Wednesday, July 10, 2024

Lunch: 13.00-14.00

Roundtable Discussions (In Parallel Sessions)

14.00 Challenges of Using Nanomaterials in Concrete

Moderator: *N. Garg*; Co-Moderator: *O. Mendoza*

14.00 Concrete Sustainability and Nanotechnology

Moderator: *Y. Joshi*; Co-Moderator: *C.A. Weiss, Jr.*

Closing Ceremony: 15.00-15.15

15.30 RILEM Meeting

Chair: *F. Sanchez*

17.00 Networking Event (TBA)

Thursday, July 11, 2024

Conference Room Pegaso

RILEM Workshop

TC 302-CNC: Carbon-based Nanomaterials for Multifunctional Cementitious Matrices

Morning Sessions

Chair: *F. Sanchez*

09.00 Welcome & Introduction (FS)

09.15 Personal Introduction & Motivation (All)

Break: 10.00-10.30

10.30 Dispersion of carbon nanomaterials (WG1)

11.30 Hardened state properties (WG2)

Lunch: 12.30-13.30

Afternoon Sessions

Chair: *F. Sanchez*

13.30 Smart properties (WG3)

14.30 Poster session

15.30 Research activity/experiments

16.30 Road map demonstration and wrap up

Closing and Farewell: 17.00-17.30

Thursday, July 11, 2024

SESSION CHAIRS

Monday, July 8, 2024

11.00-12.40	13.30-15.00	15.20-17.00
<i>F. Sanchez</i> <i>J. Olek</i>	<i>K. Sobolev</i> <i>R. Ferron</i>	<i>M. Liebscher</i> <i>N. Garg</i>

Tuesday, July 9, 2024

10.40-12.00	13.20-15.00	15.20-16.40
<i>L. Ferrara</i> <i>J. Němeček</i>	<i>J. Zhao</i> <i>C.A. Weiss Jr.</i>	<i>F. Matta</i> <i>M. Maglogianni</i>

Wednesday, July 10, 2024

08.20-9.40
<i>S.P. Shah</i> <i>P. Hou</i>