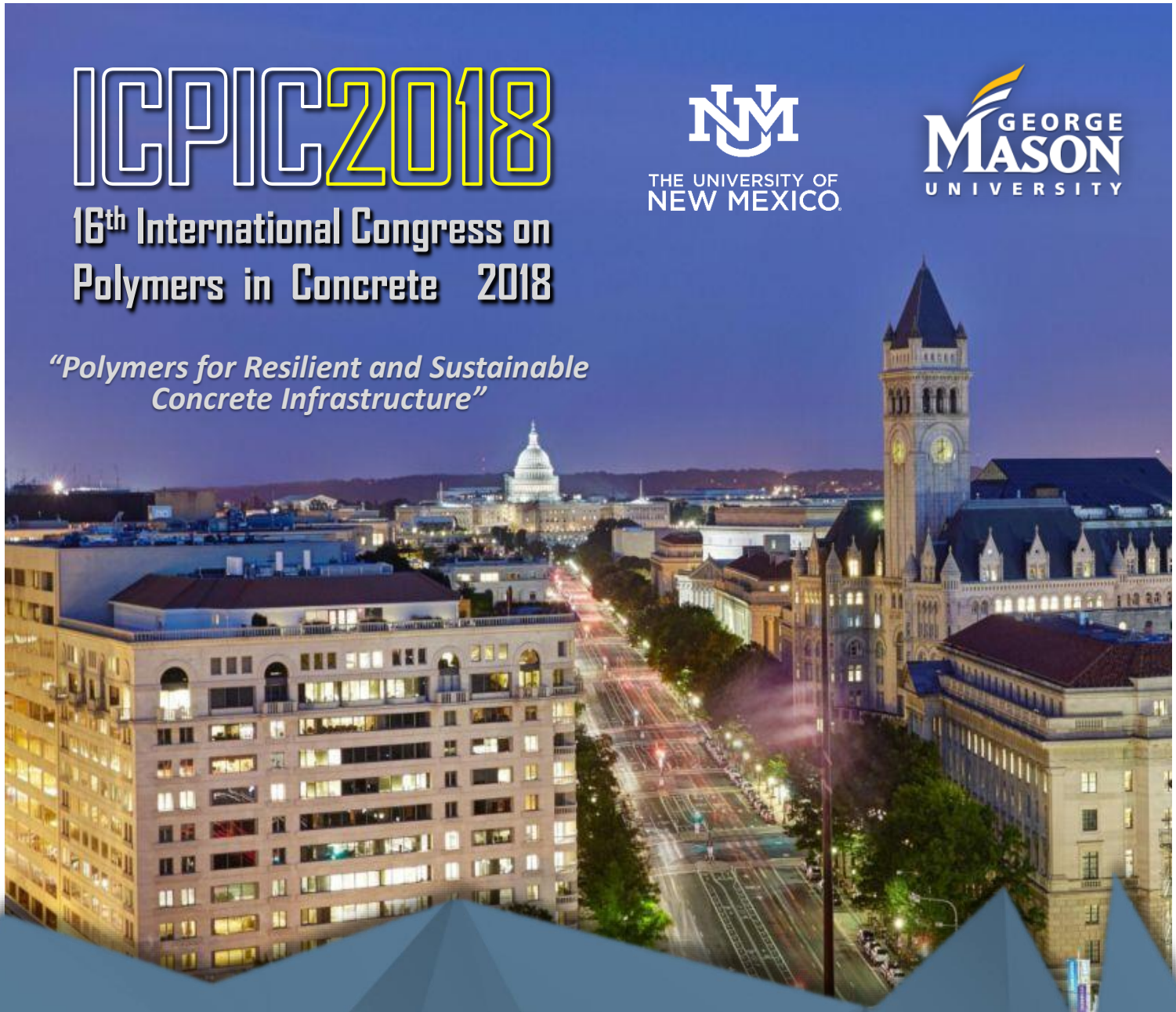
ICPIC2018

16th International Congress on Polymers in Concrete 2018

"Polymers for Resilient and Sustainable Concrete Infrastructure"

THE UNIVERSITY OF NEW MEXICO

GEORGE MASON UNIVERSITY



April 29th - May 1st 2018

CONFERENCE PROGRAM

icpic2018.unm.edu

Dear Colleagues,

I am honored to welcome you to the 16th International Congress on Polymers in Concrete, ICPIC 2018 with theme: *Polymers for Resilient and Sustainable Concrete Infrastructure*. For more than 40 years, ICPIC has been the leading congress worldwide in the interactive field of polymers in concrete. ICPIC 2018 is held from April 29th to May 1st, 2018 at the Willard InterContinental Hotel, in Washington D.C., USA., following 15 successful congresses.

Taking place at Washington DC, USA, ICPIC 2018 provides a unique opportunity to polymer concrete researchers, manufacturers, suppliers, designers and contractors to confer and engage on needed discussions on the future use of polymers in concrete infrastructure. The conference has participation of 29 countries worldwide with 96 technical papers reporting on advances in the use of polymers in concrete. ICPIC 2018 papers cover new advances on the use of nanomodified polymers, geopolymers and polymer phase changing materials on the mechanical and thermal properties in concrete.

Finally, I hope you will find the time to enjoy your stay in the splendid spring of Washington DC, to observe the US national treasures in the surrounding area and to entertain our beautiful historical conference venue: The Willard InterContinental Hotel. Again, welcome to ICPIC 2018!

Conference Chairman

Mahmoud Reda Taha, PhD, PEng, FACI
Professor and Chair,
Department of Civil Engineering
The University of New Mexico

CONFERENCE PROGRAM

SUNDAY APRIL 29TH		
12:00	16:00	**REGISTRATION**
17:30	18:30	**EDUCATIONAL TALK: CPMs: What are They, What are Their Uses, and What is the Future?** *David Fowler (USA) and Deon Kruger (South Africa)* *Chairman*: *Mahmoud Reda Taha (USA)* *Location:* George Mason University*
19:00	20:00	**RECEPTION DINNER *(George Mason University)****
MONDAY APRIL 30TH		
08:00	17:00	**REGISTRATION**
08:00	08:30	**CONFERENCE OPENING *(Ballroom)*:** *Conference Chairman, Mahmoud Reda Taha (USA)* **OPENING REMARKS:** Dean of Volgenau School of Engineering, George Mason University, Kenneth Ball (USA) **The US Bridge Inventory and the Need for More Resilient/Sustainable Design:** Joseph Hartmann, Director of Federal Highway Administration (FHWA) (USA)
08:30	09:30	**KEYNOTE SESSION 1 *(Ballroom)*** *Chairman: Mahmoud Reda Taha (USA)* **Concrete-Polymer Materials: How Far Have We Come and Where Do We Need to Go?** *David Fowler (USA)* **Polymer Concrete for Bridge Preservation** *Michael Sprinkel (USA)*
09:30	09:45	**COFFEE BREAK** *(Buchanan Room and Pierce Room)*
09:45	11:45	**SESSION M-M1:** **Polymer Materials** **CHAIRMAN:** *David Whitney (USA)* **ROOM:** Ballroom **SESSION M-M2:** **Geopolymers** **CHAIRMAN:** *Lech Czarnecki (Poland)* **ROOM:** Fillmore Room **SESSION M-M3:** **Strengthening & Restoration** **CHAIRMAN:** *Michael Sprinkel (USA)* **ROOM:** Taylor Room
11:45	12:45	**LUNCH** *(The Willard Room)*
12:00	12:45	**SPONSORS PRESENTATIONS: Tran-SET, Transpo Industires, Armrock** *(The Willard Room)*
13:00	13:30	**KEYNOTE SESSION 2 *(Ballroom)*** *Chairman: David Fowler (USA)* **Feasibility Study of the Use of Polymer-Modified Cement Composites as 3D Concrete Printing Material** *Kyu-Seok Yeon (South Korea)*

**Transportation will be provided from and back to the Willard Intercontinental Hotel (Conference Venue)*

CONFERENCE PROGRAM

THE UNIVERSITY OF NEW MEXICO

GEORGE MASON UNIVERSITY

MONDAY APRIL 30TH				
13:40	15:00	**SESSION M-A1:** Polymer Concrete **CHAIRMAN:** *Amr El-Dieb (UAE)* **ROOM:** *Ballroom*	**SESSION M-A2:** PC with Recycled Waste **CHAIRMAN:** *John Myers (USA)* **ROOM:** *Fillmore Room*	**SESSION M-A3:** Polymer Fiber Concrete **CHAIRMAN:** *Andrzej Garbacz (Poland)* **ROOM:** *Taylor Room*
15:00	15:20	**COFFEE BREAK** *(Buchanan Room and Pierce Room)*		
15:20	17:00	**SESSION M-E1:** Polymer Concrete **CHAIRMAN:** *Deon Kruger (South Africa)* **ROOM:** *Ballroom*	**SESSION M-E2:** FRP **CHAIRMAN:** *Eslam Soliman (Egypt)* **ROOM:** *Fillmore Room*	**SESSION M-E3:** PC with Nanomaterials **CHAIRMAN:** *Kejin Wang (USA)* **ROOM:** *Taylor Room*
17:15	21:00	**DINNER CRUISE***		
TUESDAY MAY 1ST				
7:00	08:00	**ICPIC Board Meeting** *(The Grant Suite)*		
08:00	12:00	**REGISTRATION**		
08:30	09:30	**KEYNOTE SESSION 3 *(Ballroom)*** *Chairman: Kyu-Seok Yeon (South Korea)* **Experimental Analysis and Micromechanics-Based Prediction of the Elastic and Creep Properties of Polymer-Modified Concrete at Early Ages** *Andrea Osburg (Germany)* **Durability and Long-Term Performance of Fiber-Reinforced Polymer as a New Civil-Engineering Material** *Brahim Benmokrane (Canada)*		
09:30	09:45	**COFFEE BREAK** *(Buchanan Room and Pierce Room)*		
09:45	11:45	**SESSION T-M1:** Structural Applications **CHAIRMAN:** *Mohammed Elgawady (USA)* **ROOM:** *Ballroom*	**SESSION T-M2:** PC with Recycled Waste **CHAIRMAN:** *Girum Solomon Urgessa (USA)* **ROOM:** *Fillmore Room*	**SESSION T-M3:** Polymer Fiber Concrete **CHAIRMAN:** *Mohd. Raihan Taha (Malaysia)* **ROOM:** *Taylor Room*
12:00	13:30	**LUNCH** *(The Willard Room)*		

**Transportation will be provided from and back to the Willard Intercontinental Hotel (Conference Venue)*

CONFERENCE PROGRAM

TUESDAY MAY 1ST

12:00	12:15	**ICPIC President Speech** *(The Willard Room)*: *Kyu-Seok Yeon (South Korea)* **ICPIC-Owen Nutt Award**		
12:15	12:30	**Michael Schmidt Best Student's Paper Award:** *Michael Schmidt (USA)*		
12:30	13:30	**SPONSORS PRESENTATIONS: Sika Ag, Smooth-On, Inc** *(The Willard Room)*		
13:30	14:00	**KEYNOTE SESSION 4** *(Ballroom)* *Chairman: Brahim Benmokrane (Canada)* **Nano-modified Polymer Concrete – A New Material for Smart and Resilient Structures** *Mahmoud Reda Taha (USA)*		
14:00	15:20	**SESSION T-A1:** **Polymer Phase Changing Material** **CHAIRMAN:** *Alexander Flohr (Germany)* **ROOM:** *Ballroom*	**SESSION T-A2:** **Polymer Concrete** **CHAIRMAN:** *Muhammad Kalimur Rahman (KSA)* **ROOM:** *Fillmore Room*	**SESSION T-A3:** **Tran-SET Track: Polymer Materials** **CHAIRMAN:** *Homero Castaneda (USA)* **ROOM:** *Taylor Room*
15:20	15:40	**COFFEE BREAK** *(Buchanan Room and Pierce Room)*		
15:40	17:20	**SESSION T-E1:** **Polymer Materials** **CHAIRMAN:** *Makoto Kawakami (Japan)* **ROOM:** *Ballroom*	**SESSION T-E2:** **FRP** **CHAIRMAN:** *Jinping Lu (Singapore)* **ROOM:** *Fillmore Room*	**SESSION T-E3:** **Geopolymers** **CHAIRMAN:** *Aly Said (USA)* **ROOM:** *Taylor Room*
17:20	17:30	**CONFERENCE CLOSING REMARKS** *(Ballroom)*: *Conference Chairman, Mahmoud Reda Taha (USA)*		

CONFERENCE PROGRAM

MONDAY APRIL 30TH 09:45 – 11:45

SESSION M-M1: Polymer Materials	SESSION M-M2: Geopolymers	SESSION M-M3: Strengthening & Restoration
Bio-Based Superplasticizers for Cement Based Materials *Stephan Partschefeld, Andrea Osburg*	Microstructural and Strength Investigation of Geopolymer Concrete with Natural Pozzolan and Micro Silica *Muhammed Kalimur Rahman, Mohammed Ibrahim, Luai M. Al-Hems*	Review of Polymer Coatings Used for Blast Strengthening of Reinforced Concrete and Masonry Structures *Girum Urgessa, Mohammadjavad Esfandiari*
Synthesis and Characterization of Superabsorbent Polymer Hydrogels Used as Internal Curing Agents: Impact of Particle Shape on Mortar Compressive Strength *Stacey Kelly, Matthew Krafcik, Kendra Erk*	Effect of Different Class C Fly Ashes Composition on the Properties of the Alkali Activated Concrete *Eslam Gomaa, Simon Peter Sargon, Cedric Kashosi, Ahmed Gheni, Mohamed ElGawady*	Bio-based Polyurethane Elastomer for Strengthening Application of Concrete Structures under Dynamic Loadings *Sudharshan N. Raman, H. M. Chandima C. Somarathna, Azrul A. Mutalib, Khairiah H. Badri, Mohd. Raihan Taha*
Analysis of Mechanical Behavior and Durability of Coatings for Use as Flooring in the Petroleum Industry *Jane Proszek Gorninski, Jessica Maiara de Freitas*	Optimization of Fly Ash Based Geopolymer Using a Dynamic Approach of the Taguchi Method *Takeomi Iwamoto, Kozo Onoue, Yasutaka Sagawa, Ryosuke Tsutsumi*	Improvement Works to Existing Column Stumps by Fiber Reinforced Polymer Strengthening System *Jin Ping Lu, Sook F. Wong*
The Use of Polymer Additions to Enhance the Performance of Industrial and Residential Decorative Concrete Flooring. *Michelle Sykes, Deon Kruger*	Effect of 3D Printing on Mechanical Properties of Fly Ash Based Inorganic Geopolymer *Biranchi Panda, Nisar Ahamed Noor Mohamed, Ming Jen Tan*	Evaluation of Polymer-Modified Restoration Mortars for Corrosion Resistance of Sewage Treatment Structures *Wanki Kim, Sunhee Hong*
The Effect of Glucose on the Properties of Cement Paste *Samantha Mirante, Ali Ghahremaninezhad*	Effect of Curing Temperatures on Zero-Cement Alkali-Activated Mortars *Simon Peter Sargon, Eslam Gomaa, Cedric Kashosi, Ahmed Gheni, Mohamed ElGawady*	Silicone Resin Enclosing Method Applied for the Maintenance of Steel Bearings *Makoto Kawakami, Fujio Omata, Atsushi Toyoda, Shingo Kato*
Screening Encapsulated Polymeric Healing Agents for Carbonation Exposed Self-Healing Concrete, Service Life Extension and Environmental Benefit *Philip Van den Heede, Bjorn Van Belleghem, Maria Adelaide Araújo, João Feiteira, Nele De Belie*	Oilwell Cement Modified with Bacterial Nanocellulose *Christian Marcelo Martín, Ignacio Zapata Ferrero, Patricia Cerrutti, Analía Vazquez, Diego Manzanal, Teresa Maria Pique*	Strength Performance of Concrete Beams Reinforced with BFRP Bars *Elzbieta Szmigiera, Marek Urbanski, Kostiantyn Protchenko*

CONFERENCE PROGRAM

MONDAY APRIL 30TH 13:40 – 15:00

SESSION M-A1: polymer Concrete	SESSION M-A2: PC with Recycled Waste	SESSION M-A3: Polymer Fiber Concrete
Are Polymers Still Driving Forces in Concrete Technology? *Lech Czarnecki, Mahmoud Reda Taha, Ru Wang*	Lightweight Structural Recycled Mortars Fabricated with Polyurethane and Surfactants *Veronica Calderon, Raquel Arroyo, Matthieu Horgnies, Ángel Rodríguez Saiz, Pablo Luis Campos*	Effect of Fiber Combinations on the Engineering Properties of High Performance Fiber Reinforced Cement Composites *Dongyeop Han, Min-Cheol Han, Jong-Tae Lee, Cheon-Goo Han*
Environmental Temperature and Humidity Adaptability of Polymer Modified Cement Mortar *Ru Wang, Shaokang Zhang, Peiming Wang*	Hydration in Mortars Manufactured with Ladle Furnace Slag (LFS) and the Latest-Generation of Polymeric Emulsion Admixtures *Ángel Rodríguez Saiz, Sara Gutiérrez González, Isabel Santamaría Vicario, Veronica Calderon, Carlos Junco, Jesús Gadea*	Application of Fibre Reinforced Polymer Reinforced Concrete for Low Level Radioactive Waste Disposal *Ricardo Lopes, Deon Kruger*
Mechanical Properties of Polymer Cement - Fiber Reinforced Concrete (PC-FRC) – Comparison Based on Experimental Studies *Tomasz Piotrowski, Piotr Prochon, Alice Capuana*	Chemical Resistance of Vinyl-ester Concrete with Waste Mineral Dust Remaining After Preparation of Aggregate for Asphalt Mixture *Joanna Sokołowska, Piotr Woyciechowski*	Efficiency of Polymer Fibers in Lightweight Plaster *Jakob Sustersic, Andrej Zajc, Gregor Narobe*
Innovative Polymer-Modified Pervious Concrete *Aly Said, Oscar Quiroz*	Effect of Using Kaolin and Ground Granulated Blast-furnace Slag on Green Concrete Properties *Kamal G. Sharobim, Hassan A. Mohamadien, Omar M. Omar, Mostafa M. Geriesh*	Steel-Fiber Self-Consolidating Rubberized Concrete Subjected to Impact Loading *Mohamed Ismail, Assem Hassan, Katherine E. Ridgley, Bruce Colbourne*

MONDAY APRIL 30TH 15:20 – 17:00

SESSION M-E1: Polymer Concrete	SESSION M-E2: FRP	SESSION M-E3: PC with Nanomaterial
Combined Methods to Investigate the Crack-Bridging Ability of Waterproofing Membranes *Marius Waldvogel, Roger Zurbriggen, Alfons Berger, Marco Herwegh*	On Mechanical Characteristics of HFRP Bars with Various Types of Hybridization *Andrzej Garbacz, Elzbieta Szmigiera, Kostiantyn Protchenko, Marek Urbanski*	A Comparative Study on Colloidal Nano Silica Incorporation in Polymer Modified Cement Mortars *Niloufar Zabihi, M. Hulusi Ozkul*
Polymer Concrete for A Modular Construction System – Investigation of Mechanical Properties and Bond Behaviour by Means of X-Ray CT *Franziska Vogt, Alexander Gypser, Florian Kleiner, Andrea Osburg*	Microstructure and Mechanical Property Behavior of FRP Reinforcement Autopsied from Bridge Structures Subjected to In-situ Exposure *Wei Wang, Omid Gooranorimi, John Myers, Antonio Nanni*	Effect of Incorporating Nano Silica on the Strength of Natural Pozzolan-Based Alkali Activated Concrete *Mohammed Ibrahim, Muhammed K. Rahman, Megat Azmi M. Johari, Mohammed Muslehuddin*
Bending and Crack Characteristics of Polymer Lattice-Reinforced Mortar *Brian Salazar, Ian Williams, Parham Aghdasi, Claudia Ostertag, Hayden Taylor*	Effect of Sustained Load Level on Long-term Deflections in GFRP and Steel-Reinforced Concrete Beams *Stephanie Walkup, Shawn Gross, Eric Musselman*	Mechanical Characterization of Polymer Nanocomposites Reinforced with Graphene Nanoplatelets *Ugur Kilic, Sherif M. Daghash, Osman E. Ozbulut*
The Influence of Specimen Shape and Size on The PCC Compressive Strength Values *Joanna Sokołowska, Tomasz Piotrowski, Iga Gajda*	The Influences of Mechanical Load on FRP Composites Subjected to Environmental Corrosion *Mohamed ElGawady, Song Wang*	Performance of UHPC and Nano-Modified Polymer Concrete (NMPC) Composite Wall Panels for protective Structures *Ahmed Ibrahim, Olaniyi Arowojolu, Mahmoud Reda Taha*
Long-term Investigation on the Compressive Strength of Polymer Concrete with Fly Ash *Joanna Sokołowska*	Flexural Behavior and Cracks in Concrete Beams Reinforced with GFRP Bars *Naser Kabashi, Cene Krasniqi, Jakob Sustersic, Arton Dautaj, Enes Krasniqi, Hysni Morina*	Pultruded GFRP Reinforcing Bars with Carbon Nanotubes *Rahulreddy Chennareddy, Amr Riad, Mahmoud Reda Taha*

CONFERENCE PROGRAM

TUESDAY MAY 1ST 09:45 – 11:45

SESSION T-M1: PC Structural Applications	SESSION T-M2: PC with Recycled Waste	SESSION T-M3: Polymer Fiber Concrete
PIC: Does It Have Potential? *David Fowler*	Properties of Ceramic Waste Powder Based Geopolymer Concrete *Sama Aly, Dima Kanaan, Amr El-Dieb, Samir Abu-Eishah*	Bond Performance of Steel Reinforced Polymer (SRP) Subjected to Environmental Conditioning and Sustained Stress *Wei Wang, John Myers*
A Perspective on 40 Years of Polymers in Concrete History *Albert O. Kaeding*	Use of Recycled Polymers in Asphalt Concrete for Infrastructural Applications *Sook F. Wong*	Dynamic Behavior of Textile Reinforced Polymer Concrete Using Split Hopkinson Pressure Bar *Mahmoud Abdel-Emam, Eslam Soliman, Amr Nassr, Wael Khair-Eldeen, Aly Abd El-Shafy*
Precast Polymer Concrete Panels for Use on Bridges and Tunnels *Michael Stenko*	Influence of Method of Preparation of PC Mortar with Waste Perlite Powder on Its Rheological Properties *Grzegorz Adamczewski, Piotr Woyciechowski, Paweł Łukowski, Joanna Sokołowska, Beata Jaworska*	High-Strength Strain-Hardening Cement-Based Composites (HS-SHCC) Made with Different High-Performance Polymer Fibers *Marco Liebscher, Iurie Curosu, Viktor Mechtcherine, Astrid Drechsler, Stefan Michel*
Development of Ultra Rapid-Hardening Epoxy Mortar for Railway Sleepers *Sunhee Hong, Jaehoon Lee, Duhyouk Kim, Junwoo Kim, Yong Jeong*	Latex-Modified Concrete Overlays Using Recycled Waste Paint *Aly Said, Oscar Quiroz*	Uniaxial Tensile Creep Behavior of Two Types of Polypropylene Fiber Reinforced Concrete *Rutger Vrijdaghs, Marco di Prisco, Lucie Vandewalle*
Contribution of C-PC to Resilience of Concrete Structures in Seismic Country Japan *Makoto Kawakami, Mikio Wakasugi, Fujio Omata*	Design and Manufacture of a Sustainable Lightweight Prefabricated Material Based on Gypsum Mortar with Semi-Rigid Polyurethane Foam Waste *Sara Gutiérrez González, Carlos Junco, Veronica Calderon, Ángel Rodríguez Saiz, Jesús Gadea*	The Effect of Combinations of Treated Polypropylene Fibers on the Energy Absorption of Fiber Reinforced Shotcrete *Johannes Bester, Kulani Mapimele, George Fanourakis*
Development Length of Steel Reinforcement in Polymer Concrete for Bridge Deck Closure *Moneeb Genedy, Rahulreddy Chennareddy, Michael Stenko, Mahmoud Reda Taha*	Cement Mortars Lightened with Rigid Polyurethane Foam Waste Applied on Site. Suitability and Durability *Carlos Junco, Sara Gutiérrez González, Jesús Gadea Sáinz, Veronica Calderon, Ángel Rodríguez Saiz*	Properties of PVA Fiber Reinforced Geopolymer Mortar *Wei Li, Hongjian Du*

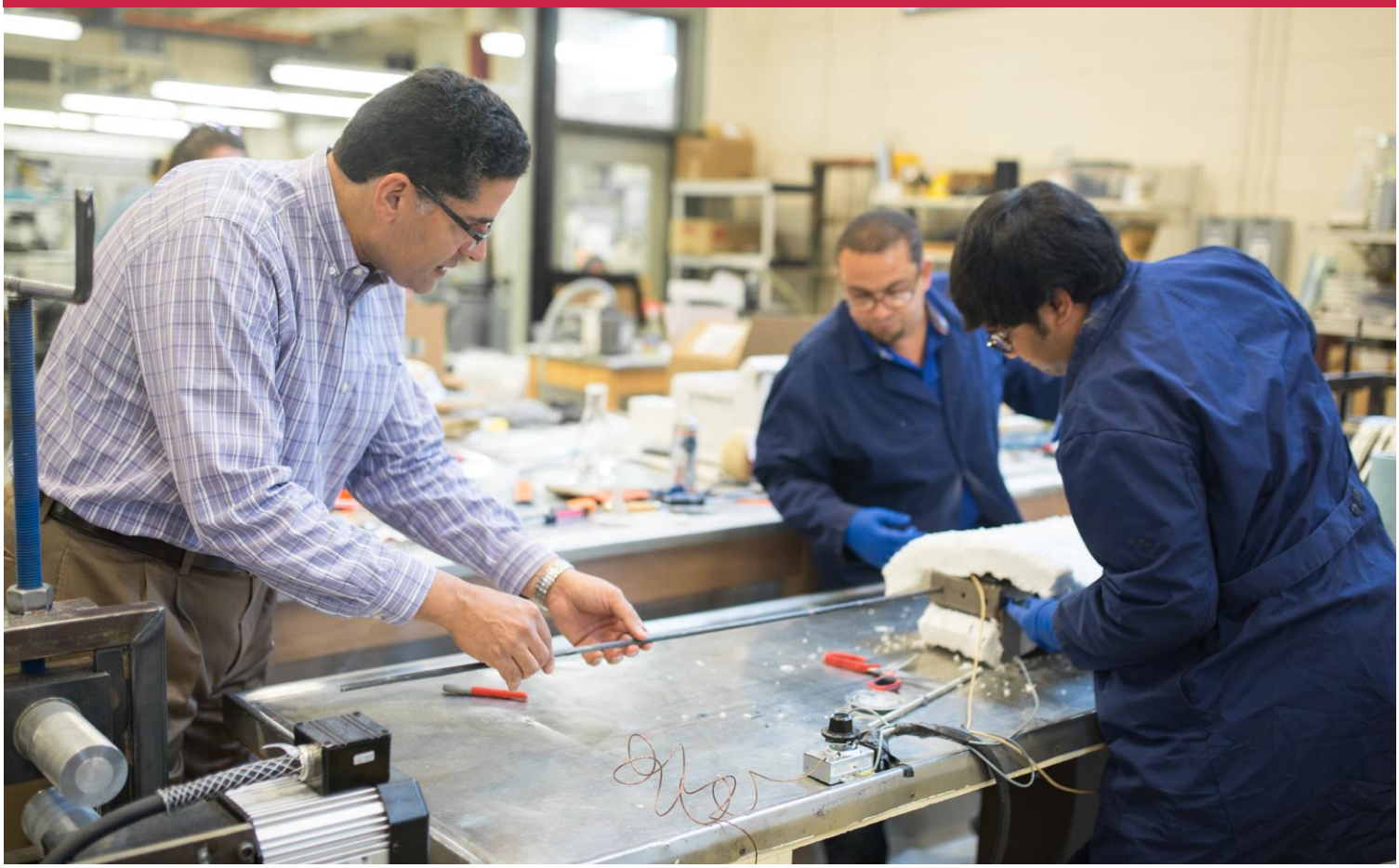
TUESDAY MAY 1ST 14:00 – 15:20

SESSION T-A1: Polymer Phase Changing Material	SESSION T-A2: Polymer Concrete	SESSION T-A3: Tran-SET Track: Polymer Materials
Mortars with Phase Change Materials and Stone Waste to Improve Energy Efficiency in Buildings *Mariaenrica Frigione, Mariateresa Lettieri, Antonella Sarcinella, José Aguiar*	Overlays: A Great Use for Polymer Concrete *David Fowler, David Whitney*	Effect of Methyl Methacrylate Monomer on Properties of Unsaturated Polyester Resin-Based Polymer Concrete *Kyu-Seok Yeon, Nan Ji Jin, Jung Heum Yeon*
Physical and Mechanical Properties of Cement Mortars with Direct Incorporation of Phase Change Material *Sandra Cunha, José Aguiar, Victor Ferreira, António Tadeu*	Contribution of Concrete-Polymer Composites and Ancient Mortar Technology to Sustainable Construction *Dionys Van Gemert, Lech Czarnecki, Ru Wang, Özlem Cizer*	Lightweight Filled Epoxy Resins for Timber Restoration *Torben Wiegand, Andrea Osburg*
Application of Phase Change Materials (PCM) in Concrete for Thermal Energy Storage *Nengfu Tao, Hai Huang*	Smart Monitoring of Movement and Internal Temperature Changes Within Polymer Modified Concrete Repair Patches. *Johannes Bester, Jacques Engelbrecht, Michael Grobler*	Evaluation of the Performance of Engineered Cementitious Composites (ECC) Produced from Local Materials *Gabriel Arce, Hassan Noorvand, Marwa Hassan, Tyson Rupnow*
Mechanical Performance of Fly Ash Geopolymeric Mortars Containing Phase Change Materials *M. Kheradmand, Z. Abdollahnejad, F. Pacheco-Torgal*	PC with Superior Ductility using Mixture of Pristine and Functionalized Carbon Nanotubes *AlaEddin Douba, Mahmoud Reda Taha*	Evaluation of Microencapsulated Corrosion Inhibitors in Reinforced Concrete *Reece Goldsberry, Jose Milla, Melvin McElwee, Marwa Hassan, Homero Castaneda*

TUESDAY MAY 1ST 15:40 – 17:20

SESSION T-E1: Polymer Materials	SESSION T-E2: FRP	SESSION T-E3: Geopolymers
Microstructured Polymers and Their Influences on the Mechanical Properties of PCC *Alexander Flohr, Luise Göbel, Andrea Osburg*	Finite Element Modeling of CFRP Strengthened Low Strength Concrete Short Columns *Khaled A. Alawi Al-Sodani, Muhammed K. Rahman, Mohammed A. Al-Osta, Ali Al-Gadhib*	Applications of Geopolymers in Concrete for Low-Level Radioactive Waste Containers *Kyle Poolman, Deon Kruger*
Effects of Anionic Asphalt Emulsion on Early Age Cement Hydration *Jinxiang Hong, Kejin Wang, Wei Li*	Flexural Rigidity Evaluation of Seismic Performance of Hollow-Core Composite Bridge Columns *Mohanad M. Abdulazeez, Mohamed ElGawady*	Development of Fiber-Reinforced Slag-Based Geopolymer Concrete Containing Lightweight Aggregates Produced by Granulation of Petrit-T *Mohammad Mastali, Katri Piekkari, Päivö Kinnunen, Mirja Illikainen*
Polymer Solutions for Protection of Concrete Exposed to Strong Alkaline or Acid Effluent on Industrial Installations *Nicolas Roche, Hervé Davaux*	Three-Dimensional Numerical Analysis of Hollow-Core Composite Building Columns *Mohanad M. Abdulazeez, Mohamed ElGawady*	Performance of Steel-Fiber-Reinforced High Performance One-Part Geopolymer Concrete *Zahra Abdollahnejad, Tero Luukkonen, Päivö Kinnunen, Mirja Illikainen*
Stability of Latex in Cement Paste: Experimental Study and Theoretical Analysis *Dongdong Han, Weideng Chen, Shiyun Zhong*	Fatigue Behavior Characterization of Superelastic Shape Memory Alloy Fiber-reinforced Polymer Composites *Sherif M. Daghash, Osman E. Ozbulut*	Thermal Performance of Fly Ash Geopolymeric Mortars Containing Phase Change Materials *M. Kheradmand, M. Azenha, F. Pacheco-Torgal*
Experimental Verification of Use Secondary Raw Materials as Fillers to Epoxy Polymer Concrete *Rostislav Drochytka, Jakub Hodul*	Finite Element Analysis of RC Beams Strengthened in Shear with NSM FRP Rods *Akram Jawdhari, Ali Adheem*	Performance Studies on Self Compacting Geo Polymer Concrete at Ambient Curing Condition *Narendra Kumar Boppana, Krishneswar Ramineni, Manikanteswar Ramineni*

A mile above and beyond Silicon Valley.



On a mile-high mesa between blue skies and watermelon mountains, The University of New Mexico offers far more than any engineering student could ever expect. Explore uncharted possibilities and partner with premier national laboratories like Sandia, Los Alamos and the Air Force Research Laboratory. Students are immersed in hands-on learning experiences, both tested in the lab and proven in the field. The people here solve complex problems with their unique perspectives. No matter what you're looking to make for your future, create yours at UNM.

ENGINEER YOUR GREATER FUTURE. CIVIL.UNM.EDU

CIVIL ENGINEERING

DIAMOND SPONSORS

ARMOROCK

Tran-SET
Transportation Consortium of South-Central States

TRANSPO INDUSTRIES, Inc.
www.transpo.com

BUILDING TRUST
Sika®

SMOOTH-ON
SINCE 1895

eps
ENGINEERED POLYMER SOLUTIONS
Science Simplified

PLATINUM SPONSORS

SEWER SHIELD COMPOSITES

The SK&A Group
Structural Engineers

structural TECHNOLOGIES
A Structural Group Company

GOLD SPONSORS

FMC

METRO CAST CORPORATION

BASF
We create chemistry

CONSTRUCTION SUCCESS
CONCRETE STRATEGIES

SILVER SPONSORS

CTS CEMENT