The American Ceramic Society
ceramics.org

15th Advances

in Cement-Based Materials

University of Colorado Boulder

June 11-13, 2025

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15th Advances
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WELCOME TO THE 15TH ADVANCES IN CEMENT-BASED MATERIALS CONFERENCE!

We are thrilled to welcome you to the 15th Advances in Cement-Based Materials Conference, hosted by the University of Colorado Boulder and The American Ceramic Society. This year's conference is held in beautiful Boulder, CO—a vibrant city known for not only for its natural beauty, but also for its reputation for science and engineering innovation and steadfast commitment to environmental stewardship.

The conference continues to serve as a vital platform for researchers, industry professionals, and academics to exchange ideas and explore the latest advancements in cement-based materials. With 88 oral presentations across 12 parallel sessions and 50 poster presentations, this year's program covers a wide range of topics, including:

- Rheology and Additive Manufacturing
- Bio-Inspired Cementitious Materials
- Sustainability
- Computational and Data-Driven Materials Science
- Materials Characterization Techniques
- Cement Chemistry
- Supplementary Cementitious Materials

We are excited to host three keynote sessions, featuring invited presentations from Prof. Lori Tunstall (Colorado School of Mines), Dr. Jesse Benck (Vice President of R&D at Sublime Systems), and a distinguished panel of National Laboratory researchers: Dr. Anastasia Aday (NREL), Dr. Denise Antunes da Silva (ORNL), and Dr. William Jolin (SRNL). Each of these speakers brings a unique and timely perspective to share with our community.

We are honored to celebrate Dr. Kimberly Kurtis of the Georgia Institute of Technology as this year's Della Roy Lecturer. Dr. Kurtis will share her visionary research and long-standing contributions to the field, exemplifying the leadership and innovation that this lecture seeks to recognize.

In addition to the technical sessions, we've planned several special events that infuse the spirit of Colorado into our program. Join us for a welcome reception on historic Pearl Street, blending indoor and outdoor spaces in the heart of downtown Boulder. A DEI event at the Museum of Boulder will highlight Black history in Boulder, connecting our professional community with the region's diverse cultural legacy. For those seeking a breath of fresh mountain air, we invite you to participate in an evening group hike, designed for hikers of all experience levels.

This conference is not only about sharing knowledge but also about building a dynamic and diverse community. We extend a warm welcome to our young members, whose energy and ideas are vital to the future of our field. Whether this is your first time attending or your fifteenth, we hope you find inspiration, collaboration, and belonging here.

Thank you for joining us. We look forward to an engaging, impactful, and memorable conference experience in Boulder!

Wil V. Srubar, III, University of Colorado Boulder

Prannoy Suraneni, University of Miami

Vicki Evans, ACerS

CONFERENCE ORGANIZERS

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AGENDA AND SCHEDULE OF EVENTS

Tuesday, June 10	Location	Time
DEI Event (RSVP required)	Museum of Boulder	4:30pm
Welcome Event (RSVP required)	Avanti	7:00pm
Wednesday, June 11	**Location**	**Time**
Registration & Continental Breakfast	*Atrium	8:30 -9:00am
Opening Remarks	*ECCS 201	9:00 - 9:15am
Keynote Speaker - Dr. Lori Tunstall	ECCS 201	9:15 - 10:00am
Coffee Break	Atrium	10:00 - 10:15am
Breakout Sessions A and B		10:15 am - 12:00pm
A - Rheology and Additive Manufacturing	*KOBL 352	
B - Durability	ECCS 201	
Catered Lunch	Atrium	12:00 - 12:30pm
Business Meeting	ECCS 201	12:30 - 1:30pm
Coffee Break	Atrium	1:30 - 1:45pm
Breakout Sessions C and D		1:45 - 3:15pm
C - Bio-Inspired Cementitious Materials	ECCS 201	
D - Computational and Data Driven Materials Science	KOBL 352	
Coffee & Cookie Break	Atrium	3:15 - 4:00pm
Della Roy Lecture – Dr. Kimberly Kurtis	ECCS 201	4:00 - 5:00pm
Della Roy Reception & Poster Session	Atrium	5:00 - 7:00pm
Thursday, June 12	**Location**	**Time**
Registration & Continental Breakfast	Atrium	8:30 -9:00am
Keynote Speaker - Dr. Jesse Benck	ECCS 201	9:00 - 9:45am
Coffee Break	Atrium	9:45 - 10:00am
Breakout Sessions E and F		10:00 - 11:45am
E - Materials Characterization Techniques	KOBL 352	
F - Supplementary Cementitious Materials (1 of 2)	ECCS 201	
Group Photo		11:45am
Lunch (on your own)		11:45am - 1:15pm
Breakout Sessions G and H		1:15 - 3:00pm
G - Cement Chemistry (1 of 2)	KOBL 352	
H - Sustainability (1 of 3)	ECCS 201	
Coffee & Cookie Break	Atrium	3:00 - 3:15pm
Breakout Sessions I and J		3:15 - 5:00pm
I - Cement Chemistry (2 of 2)	KOBL 352	
J - Sustainability (2 of 3)	ECCS 201	
DEI Event - Colorado Hike	Chautauqua Ranger Cottage (Trailhead)	6:00 - 7:30pm
YPN+1 Event	Rosetta Hall	7:30 - 9:00pm
Friday, June 13	**Location**	**Time**
Keynote Speakers - National Lab Panel	ECCS 201	9:00 - 9:45am
Breakout Sessions K and L		10:00 - 11:30am
K - Sustainability (3 of 3)	KOBL 352	
L - Supplementary Cementitious Materials (2 of 2)	ECCS 201	
Closing Remarks	ECCS 201	11:30am - 12pm

* Rooms ECCS 201 and KOBL 352, and the Atrium are located at University of Colorado Boulder, (Rustandy Building, 1111 Engineering Drive, Boulder, CO, 80309)

MEETING REGULATIONS

NO PHOTOGRAPHY/ RECORDING CELL PHONES SILENT

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Note: The Society may engage photographers to photograph sessions for marketing and promotional purposes.

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BREAKOUT SESSIONS SCHEDULE

WEDNESDAY, JUNE 11

A – RHEOLOGY AND ADDITIVE MANUFACTURING
10:15AM–11:45AM | ROOM: KOBL 352 | Moderator: Kendra Erk

Time	Title	Authors
10:15	Effects of shear on rheological property development of alkali-activated binders (AAB's) studied via a model metakaolin geopolymer and aluminosilicate gel	**Thaddeus M Egnaczyk** and Norman J. Wagner, University of Delaware, Newark, DE
10:30	Sensor network and post-manufacturing inspection: The strategy to guarantee quality of 3D printed concrete structures	**Stefan Zimmermann**, Danielle Griego, Matineh Mahmoudi and Robert J. Flatt, ETH Zurich, Zurich, Switzerland
10:45	Rheological characterization of 3D-printable ultra-high-performance concrete	**Ayesha Ahmed**, Raul E Marrero, Elmer Miguel Irizarry, Shady Gomaa, and Gianluca Cusatis, Northwestern University, Evanston, IL
11:00	Multiscale investigation of 3D-printed earthen materials & structures	**Samuel J. Armistead**, Rebecca A. Mikofsky, and Wil V. Srubar III, University of Colorado Boulder, Boulder, CO, and Yierfan Maierdan, Olga B. Carcassi, Shiho Kawashima, and Lola Ben-Alon, Columbia University, New York City, NY
11:15	Concrete rheometry: Mission impossible?	**Dimitri Feys**, Missouri University of Science and Technology, Rolla, MO, and Shravan Muthukrishnan, Roman Rezaev, Daniil Mikhalev and Viktor Mechtcherine, Technische Universität Dresden, Dresden, Germany
11:30	Unraveling flow loss in superplasticized limestone calcined clay cement	**Franco Zunino**, University of California, Berkeley, Berkeley, CA

BREAKOUT SESSIONS SCHEDULE

WEDNESDAY, JUNE 11 (CONT'D)

B – DURABILITY
10:15AM–12:00PM | ROOM: ECCS 201 | Moderator: Caitlin Adams

Time	Title	Authors
10:15	Sustainable bio-inspired self-healing concrete in mitigating chloride attack	**Pardis Pourhaji** and Nima Rahbar, Worcester Polytechnic Institute, Worcester, MA
10:30	Biomineralization-induced degradation of portland cement paste	**Caitlin J. Adams**, Cansu Acarturk and Wil V. Srubar III, University of Colorado, Boulder, Boulder, CO
10:45	Self-healing of cementitious materials containing hydrogels in seawater	Farzad Rezaeicherati and **Ali Ghahremaninezhad Ph.D**, University of Miami, Coral Gables, FL
11:00	Nano-modified aggregates and Methods for Durable Concrete	Xianming Shi, University of Miami; Jing Zhong, Harbin Institute of Technology, China; Jialuo He, Washington State University
11:15	Internal curing of 3D-printed bendable cementitious composites: A path to enhanced durability and crack resistance	Tayyab Zafar and **Maryam Hojati**, University of New Mexico, Albuquerque, NM
11:30	Interfacial degradation mechanisms in fly ash-blended low-heat cement concrete under thermal gradient effects	**Haoyu Zeng**, Ming Jin and Jiaping Liu, Southeast University, Nanjing, China
11:45	**Brunauer Award Winner Presentation** From selective dissolution to crystal chemistry of brownmillerite in sulfate resisting cement	**Alexis Mériot**[1,2], Marie-Noëlle de Noirfontaine[1], Mireille Courtial[1,3], **Laurent Izoret**[2], Sandrine Tusseau-Nenez[4], Sébastien Diliberto[5], Mélanie Labourel[1,2], Sandrine Gauffinet[6] and Frédéric Dunstetter[1] (1) Ecole Polytechnique, Institut Polytechnique de Paris, (2) Syndicat Français de l'Industrie Cimentière, Clichy, France, (3) Université d'Artois, Béthune, France, (4) Ecole Polytechnique, Institut Polytechnique de Paris, Palaiseau, France, (5) Université de Lorraine, Metz, France, (6) Université de Bourgogne Franche-Comté, Dijon, France

WEDNESDAY, JUNE 11 (CONT'D)

C - BIO-INSPIRED CEMENTITIOUS MATERIALS
1:45-3:15PM | ROOM: ECCS 201 | Moderator: Kendra Erk

Time	Title	Authors
1:45	Mechanistic insights into engineering biomolecules' structure with surfactant for a novel air-entraining admixture in concrete	**Sadegh Tale Masoule** and Ali Ghahremaninezhad Ph.D, University of Miami, Coral Gables, FL
2:00	Rapid extraction & binding assessment techniques for the optimization of biomass-stabilized earth concrete	**Samuel J. Armistead**, Rebecca A. Mikofsky, and Wil V. Srubar, III, University of Colorado, Boulder, Boulder, CO, Yierfan Maierdan, Shiho Kawashima, Columbia University, New York City, NY
2:15	Disorder in tough cortical-bone inspired design of cement-based materials	**Reza Moini** and Shashank Gupta, Princeton University, Princeton, NJ
2:30	Fracture mechanics of tough and ductile architected nacre-like cementitious composites	**Shashank Gupta**, Hadi Shagerdi Esmaeeli and Reza Moini, Princeton University, Princeton, NJ
2:45	Influence of waste bovine bone on hydration kinetics, mechanical, and microstructural behavior of portland cement	**Lamiya Noor** and Wil V. Srubar III, University of Colorado, Boulder, Boulder, CO
3:00	The impacts of silane functionalized hydrogels on early-age nucleation and growth of cement hydrates	**Akul Nimish Seshadri**, John A Howarter and Kendra A. Erk, Purdue University, West Lafayette, IN

BREAKOUT SESSIONS SCHEDULE

WEDNESDAY, JUNE 11 (CONT'D)

D - COMPUTATIONAL AND DATA DRIVEN MATERIALS SCIENCE
1:45-3:15PM | ROOM: KOBL 352 | Moderator: Sriramya Nair

Time	Title	Authors
1:45	Phase transformation of nash gel under different enhanced geothermal system environments	**Yangwoo Lee** and Claire E. White, Princeton University, Princeton, NJ
2:00	Effects of nanoconfinement on salt crystallization	**Luis A Ruiz Pestana**, University of Miami, Coral Gables, FL
2:15	Modeling the corrosion of steel casing and the damage of well cement in a borehole system	**Linfei Li**, Florida International University, Miami, FL
2:30	Phase-field cohesive zone crack propagation model for layered hard-soft architected materials	**Aimane Najmeddine** and Reza Moini, Princeton University, Princeton, NJ
2:45	Micromechanics-based poro-elastoplastic-damage model for concrete incorporating superabsorbent polymer (SAP)	**Aiqing Xu**, Georgia Institute of Technology, Atlanta, GA, and Xiaoyan Man and Jiann-Wen Woody Ju, University of California, Los Angeles, Los Angeles, CA
3:00	Enhancing concrete durability and sustainability: Investigating carbonic anhydrase for corrosion resistance and self-healing in cementitious matrices	Nima Rahbar and **Sara Heidarnezhad**, Worcester Polytechnic Institute, Worcester, MA

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THURSDAY, JUNE 12

E - MATERIALS CHARACTERIZATION TECHNIQUES
10:00 - 11:45AM | ROOM: KOBL 352 | Moderator: Matt D'Ambrosia

Time	Title	Authors
10:00	Is there a future for ^{43}Ca nuclear magnetic resonance in cement science?	**Franco Zunino**, University of California, Berkeley, Berkeley, CA, Ziga Casar, Princeton University, Princeton, NJ, Davide Tisi, EPFL , Lausanne, Switzerland, and Samuel J Page and Chris Greenwell, Durham University, Durham, United Kingdom
10:15	Deploying computer vision for rapid sorptivity testing	Hossein Kabir, Sunav Raj Dahal and **Nishant Garg**, University of Illinois Urbana Champaign, Urbana, IL
10:30	Probing the nanoscale pore structure of alkali-activated metakaolin using electron microscopy and novel neutron techniques	**Anita Zhang** and Claire E. White, Princeton University, Princeton, NJ
10:45	Insight into cement paste chemical hydration being expansive through the shard test	**Raul E Marrero**, Tapiwanashe Bhibho, Gianluca Cusatis, and Zdeněk P Bažant, Northwestern University, Evanston, IL, and Ahmet A Dőnmez, US Gypsum Co., Livertyville, IL
11:00	Geochemical fingerprinting of imported cements for supply chain transparency	**Antonio T Skillicorn**, Karrie Weaver, Tiziana Vanorio, Jonathan Payneb and Sarah L Billington, Stanford University, Stanford, CA
11:15	Calcium hydroxide dissolution kinetics: Crystals and powders	**Yoonjung Han** and Jeffrey W. Bullard, Texas A&M University, College Station, TX
11:30	Understanding the growth kinetics of cementitious magnesium silicate hydrates using atomic force microscopy	**Carey Chang** and Erika La Plante, UC Davis, Davis, CA

BREAKOUT SESSIONS SCHEDULE

THURSDAY, JUNE 12 (CONT'D)

F – SUPPLEMENTARY CEMENTITIOUS MATERIALS (1 OF 2)
10:00 – 11:45AM | ROOM: ECCS 201 | Moderator: Reza Moini

Time	Title	Authors
10:00	Utilization of waste eggshell as a limestone alternative for high-volume incorporation in portland cement	**Beng Wei Chong**, Pratik Gujar, and Xijun Shi, Ingram School of Engineering, Texas State University, San Marcos, TX, and Prannoy Suraneni, University of Miami, Coral Gables, FL
10:15	Impact of sodium mordenite on carbonation rate and minerology of portland cement	**Melissa Mills**, Atolo A Tuinukuafe and Jessica M Rimsza, Sandia National Laboratories, Albuquerque, NM
10:30	Energy-positive, carbon-negative, reversible cementitious material for future infrastructure and clean energy transition	**Jialai Wang** and Maysam Bahmani, The University of Alabama, Tuscaloosa, AL
10:45	Development of a cementless binder via carbonation application to fly ash	**Jihoon Lee Mr**, and Juhyuk Moon Prof, Seoul National University, Seoul, Korea, Republic of (South), and Franco Zunino, University of California, Berkeley, Berkeley, CA
11:00	Harnessing biocarb-driven carbonate-aluminate synergy for enhanced reactivity, strength, and carbon storage in low-carbon cementitious systems	**Monica Amaral**, Xiaodong Wang and Jialai Wang, The University of Alabama, Tuscaloosa, AL
11:15	CO_2 uptake in calcium aluminosilicate materials	Subhashree Panda, **Luis A Ruiz Pestana, and Prannoy Suraneni**, University of Miami, Coral Gables, FL
11:30	Optimizing clay mineral dehydroxylation for energy-efficient supplementary cementitious material production: A kinetic and mechanistic approach	**Oluwadamilare Charles Adesina**, Sayee Srikarah Volaity, and Narayanan Neithalath, Arizona State University, Tempe, AZ, Bryan K Aylas-Paredes and Aditya Kumar, Missouri University of Science and Technology, Rolla, MO, and Chengqing Qi, Ash Grove Cement Company, Overland Park

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THURSDAY, JUNE 12 (CONT'D)

G - CEMENT CHEMISTRY (1 OF 2)
1:15 - 3:00PM | ROOM: KOBL 352 | Moderator: Alexander Brand

Time	Title	Authors
1:15	Growth kinetics of magnesium silicate hydrate: Rates and mechanisms	**Benetta MacAuley,** University of California, Davis
1:30	The impact of RED MUD-derived layered double oxides (LDO) on hydration, microstructure, and properties of cement paste	**Molan LI** and Hailong Ye, The University of Hong Kong, Hong Kong
1:45	Impact of inter-grinding on the reaction kinetics and rheology of one-part alkali-activated metakaolin	**Meddelin Setiawan** and Claire E. White, Princeton University, Princeton, NJ
2:00	Seeding effect of nano-ettringite on the hydration kinetics of tricalcium silicate C_3S, and ye'elimite $C_4A_3\$$ clinker phases	Rupack R. Halder, **Abdulkareem O Yusuf,** Ugochukwu Ewuzie and Monday U. Okoronkwo, Missouri University of Science and Technology, Rolla, MO
2:15	Cavalcade mechanisms for gaseous mineralization in portland cement	**Atolo A Tuinukuafe** and Jessica M Rimsza, Sandia National Laboratories, Albuquerque, NM
2:30	**Enhanced CO sequestration and strength of cementitious materials using a cost-effective renewable admixture**	**Aniket Patnaik,** Jialai Wang and Monica Amaral, The University of Alabama, Tuscaloosa, AL
2:45	**Enhancing the reactivity of belite via foreign dopants**	**Hyeonseok Jee** and Nishant Garg, University of Illinois Urbana Champaign, Urbana, IL

BREAKOUT SESSIONS SCHEDULE

THURSDAY, JUNE 12 (CONT'D)

H - SUSTAINABILITY (1 OF 3)
1:15 - 3:00PM | ROOM: ECCS 201 | Moderator: Lori Tunstall

Time	Title	Authors
1:15	A foundation for zero emissions: Low-energy, carbon-absorbing cement	**Matthew Watson** and Matthew Cowan, University of Canterbury, Christchurch, New Zealand, Chris Bumby, Victoria University of Wellington, Wellington, New Zealand, and Murray McCurdy, Te Pū Ao, Wellington, New Zealand
1:30	Numerical simulation of heat transfer and calcination kinetics in a novel low-temperature limestone calcination approach	**Sayee Srikarah Volaity**, Oluwadamilare Charles Adesina, Shubham Agrawal, Md Sayeed Faisal, and Narayanan Neithalath, Arizona State University, Tempe, AZ, and Aditya Kumar, Missouri University of Science and Technology, Rolla, MO
1:45	Particle packing factor (PPF): A quantitative parameter for designing sustainable UHPC	**Bayezid Baten** and Nishant Garg, University of Illinois Urbana Champaign, Urbana, IL
2:00	Microalgae-produced $CaCO_3$ as a raw material for portland cement production	**Danielle N. Beatty**, Cansu Acarturk and Wil V. Srubar III, University of Colorado, Boulder, Boulder, CO
2:15	Dissolution rate quantifications for cementitious magnesium silicate hydrate: Implications on concrete durability	**Micah W Bob** and Erika La Plante, UC Davis, Davis, CA
2:30	Sustainable belite-ye'elimite-ferrite cement: Utilizing ladle metallurgy furnace steel slag for low-cost and carbon-efficient production	**Abdulkareem O Yusuf**, Nannan Zhang, Gao Deng, Ugochukwu Ewuzie, Abiodun Saka, Hongyan Ma and Monday U. Okoronkwo, Missouri University of Science and Technology, Rolla, MO
2:45	Optimization and performance assessment of geomimetic low-carbon cement	**Chengyao Liang**, Stewart Williams, Tiziana Vanorio, Matteo Cargnello, and Alberto Salleo, Stanford Univeristy, Palo Alto, CA

THURSDAY, JUNE 12 (CONT'D)

I - CEMENT CHEMISTRY (2 OF 2)
3:15 - 5:00PM | ROOM: KOBL 352 | Moderator: Nishant Garg

Time	Title	Authors
3:15	From days to minutes	**Nishant Garg**, University of Illinois Urbana Champaign, Urbana, IL
3:30	Interaction of calcium sulfoaluminate belite cements with alkanolamine admixtures: Insights from hydration and structural build-up at early ages	**Tu-Nam Nguyen**, Angus Wilkinson and Kimberly E. Kurtis, Georgia Institute of Technology, Atlanta, GA, and Elsa Qoku, Georgia Tech, Atlanta, GA, and Burak Uzal, Abdullah Gul University, Kayseri, Turkey
3:45	Linking composition and early-age mortar compressive strength of type IL cement	**Zeyu Wang**, Devon Golden, Collins Twum, and Kimberly E. Kurtis, Gerogia Tech, Atlanta, GA, and Newell R Washburn, Carnegie Mellon University, Pittsburgh, PA
4:00	Cementitious properties of cast stone mixed with waste simulant of varying concentrations	**Jonathan L. Lapeyre**, Christopher Hossack, Mayra Diaz Acevedo, Mattew R. Asmussen and Gary L. Smith, Pacific North West National Laboratory, Richland, WA
4:15	Understanding performance variability in Type IL cements	**Yaman Garg** and Nishant Garg, University of Illinois Urbana Champaign, Urbana, IL
4:30	Development of magnesia-based cement for the solidification of am/pu-bearing effluent and disposal at WIPP	**William C Jolin**, Savannah River National Laboratory, Aiken, SC
4:45	Enhancing belite reactivity and mechanical performance: The role of chemical activators in hydration kinetics	**Bryan K Aylas-Paredes**, Missouri University of Science and Technology, Rolla, MO

BREAKOUT SESSIONS SCHEDULE

THURSDAY, JUNE 12 (CONT'D)

J - SUSTAINABILITY (2 OF 3)
3:15 - 5:00PM | ROOM: ECCS 201 | Moderator: Samuel Armistead

Time	Title	Authors
3:15	Carbon-negative lightweight aggregates: Biochar-based solutions for sustainable concrete	**Katherine Ann King**, Tung Hoang, Lori Tunstall and Ahmadreza Hedayat, Colorado School of Mines, Golden, CO
3:30	Evaluating biochar as an internal curing agent in cementitious systems	**Julia Hylton**, Lori Tunstall, and Fatemeh Hamidi, Colorado School of Mines, Golden, CO
3:45	Multiscale investigation of clay-biopolymer interactions for sustainable earth-based concrete	**Rebecca A. Mikofsky**, Samuel J. Armistead, and Wil V. Srubar III, University of Colorado Boulder, Boulder, CO and Yierfan Maierdan and Shiho Kawashima, Columbia University, New York City, NY
4:00	Closing the concrete loop: Effect of SCMs on material circularity	**Aniruddha Baral**, University of Leeds, Leeds, United Kingdom, and The University of Texas at Austin, Austin, TX, and Theodore Hanein, University of Leeds, Leeds, United Kingdom
4:15	Rheology of high-performance 3D printed cementitious materials incorporating recycled concrete	**Kathryn Eileen Sheehan Jones**, University of California Irvine, Irvine, CA
4:30	Sustainable and affordable 3D printable concrete using quarry by-products	**Anasuya Kamakshi Tippabhotla**, Aidyn Tugelbayev, Bao Chau, Anderw P. McCoy and Alexander S. Brand, Virginia Tech, Blacksburg, VA
4:45	Eco-friendly sand-concrete composite: Integrating recycled PVC for improved thermal and environmental properties	**Aboulkacem Moutie Hamed**, Zeghichi Leila, Hocine Siad and Karima Gadri, University of Biskra, Biskra, Algeria and Moha-med Lachemi, Toronto Metropolitan University, Toronto, ON

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FRIDAY, JUNE 13

K - SUSTAINABILITY (3 OF 3) 10:00 - 11:30AM | ROOM: KOBL 352 | Moderator: JP Gevaudan		
Time	**Title**	**Authors**
10:00	Optimization of carbonated supplementary cementitious materials production	**Jonathan J Smith** and Juan Pablo Gevaudan, Pennsylvania State University, State College, PA
10:15	Stability of two-phase flow with interfacial flux in CO_2 mineralization: Theory for complex system evolution	Roi Roded and **Laura E. Dalton**, Duke University, Durham, NC
10:30	Inter-grinding and carbonated curing of basalt-based alkali-activated materials: Toward sustainable solutions on earth and beyond	**Sophia Liron Bergen** and Claire E. White, Princeton University, Princeton, NJ
10:45	CO_2 mineralization mechanism of chlorellestadite	**Vikram Kumar**, Mohamed Abdelrahman, Hyeonseok Jee, and Nishant Garg, University of Illinois Urbana Champaign, Urbana, IL
11:00	Regulating the carbonation of hardened cement paste for enhanced carbon sequestration and pozzolanic reactivity	**Xi Chen**, Xiaodong Wang, Monica Amaral, Maysam Bahmani, Abdulmaliq Alawode and Jialai Wang, The University of Alabama, Tuscaloosa, AL
11:15	CO_2 uptake in basaltic fines	**Wasiu Olaniyi Alimi**, Sofiane Amroun and Prannoy Suraneni, University of Miami, Coral Gables, FL

BREAKOUT SESSIONS SCHEDULE

FRIDAY, JUNE 13 (CONT'D)

L - SUPPLEMENTARY CEMENTITIOUS MATERIALS (2 OF 2)
10:00 - 11:30AM | ROOM: ECCS 201 | Moderator: Danielle Beatty

Time	Title	Authors
10:00	Mechanochemical activation of supplementary cementitious materials	**Sofiane Amroun** and Prannoy Suraneni, University of Miami, Coral Gables, FL
10:15	From filler to framework: Mechanisms and performance improvement in cement-struvite system	**Ugochukwu Ewuzie** and Monday U. Okoronkwo, Missouri University of Science and Technology, Rolla, MO
10:30	Long-term experimental investigation of high-temperature hydration phases forming in cementitious systems with added aluminosilicates	**Lyn Zemberekci** and Sriramya D Nair, Cornell University, Ithaca, NY
10:45	Optimization of hydrothermal synthesis of kaolinite for the production of pure metakaolin	**Paolo Camesasca**, D-BAUG - IfB, ETH Zürich, Zürich, Switzerland, Franco Zunino, University of California, Berkeley, Berkeley, CA and Andrea Testino, PSI Center for Energy and Environmental Sciences, Paul Scherrer Institute, Villigen, Switzerland
11:00	Cement hydration kinetics and mechanical property development in blended cement systems with supercritical CO_2-treated off-spec coal combustion residue.	**Sarah Hlaihel**, Santiago El Awad, Sondos Hlayhel, Ahmed Senouci and Konrad J Krakowiak Dr., University of Houston, Houston, TX
11:15	UR^2: An ultra-rapid reactivity test for supplementary cementitious materials	**Yujia Min**, Hossein Kabir, Chirayu Kothari, Muhammad Farjad Iqbal and Nishant Garg, University of Illinois Urbana Champaign, Urbana, IL

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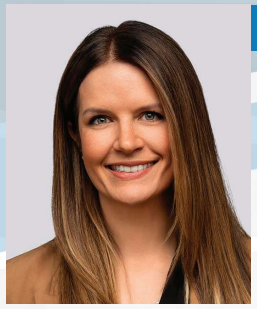
KEYNOTE SPEAKERS



Dr. Lori E. Tunstall

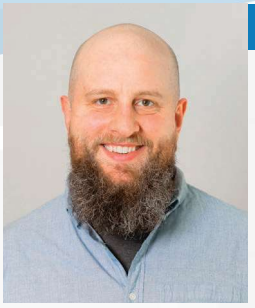
Toward Carbon-Negative Concrete: Bridging Scientific Innovation, Field Deployment, and Entrepreneurial Thinking

Abstract:
Concrete's ubiquity makes it a critical focal point for global decarbonization—and a compelling testbed for translating academic research into climate impact. This keynote will explore the potential of engineered biochar as a multifunctional, carbon-negative additive for cement-based materials, highlighting results from ongoing laboratory investigations, field trials, and standards development through ASTM. In parallel, I will reflect on how adopting tools from the entrepreneurial ecosystem — such as customer discovery, minimum viable product (MVP) frameworks, and rapid iteration—can complement traditional research approaches. These methods offer a structure for engaging stakeholders early, testing assumptions in real-world contexts, and aligning scientific inquiry with deployment pathways. By integrating entrepreneurial thinking into academic research, we can expand the role of materials scientists as climate innovators—and better position emerging technologies like biochar to meet the urgency and scale of global infrastructure challenges.

Biography:
Dr. Lori E. Tunstall is an Assistant Professor in the Civil and Environmental Engineering Department at Colorado School of Mines. She earned a joint Ph.D. in Materials Science and Civil and Environmental Engineering from Princeton University in 2016 and continued as a postdoctoral researcher for an additional year. Princeton distinguished Prof. Tunstall with two awards during her graduate program, the Wu Graduate Fellowship in Engineering and Princeton's Emerging Alumni Scholars Award for 2015 – 2016.

Following her postdoctoral position, Prof. Tunstall joined Honeywell FM&T as a chemical engineer from 2017 to 2019, where she received the 2017 Defense Programs Award of Excellence for her contributions in solving a critical manufacturing issue. She is also the recipient of a 2024 National Science Foundation (NSF) CAREER Award, the NSF's most prestigious award for early-career faculty.

Dr. Tunstall is a leading expert in the field of biochar concrete and is chairing ASTM subcommittee C09.08, which will develop a specification for biochar use in concrete. In 2024, Dr. Tunstall founded ZeroTwelve to commercialize her university research targeted at reducing concrete's carbon footprint. To support these efforts, Mines honored Dr. Tunstall with the first Mines Entrepreneurial Professorship in 2025.



Dr. Jesse Benck

Sublime Systems: Electrochemical Production of Next-Generation, Clean Cement

Abstract:
Sublime Systems has developed a new, more energy efficient, cleaner way to make cement. Our ambient temperature electrochemical process is powered by decarbonized electricity and produces low-carbon cement plus critical minerals as co-products. Sublime Cement® can be made from a wide range of non-carbonate feedstocks including abundant natural rocks and minerals or industrial waste materials. As a result, Sublime Cement™ avoids NO_x, SO_x, particulate, and greenhouse gas emissions arising from both the feedstock decomposition and heating in conventional portland cement manufacturing, while offering an ASTM C1157-compliant cement that can be used to produce concrete with the same ultimate strength and equal or better durability compared to portland cement concrete. Sublime Cement® has achieved remarkable decarbonization and has a technical path to greater than 90% decarbonization by 2030. Sublime is currently operating a pilot plant with a 100 metric ton annual capacity and plans to construct its first commercial-scale plant capable of producing greater than 22,000 tons per year of cement by 2027. In this presentation, we will provide an overview of our technology, test methodologies and results to date, and our path to scale our breakthrough technology and decarbonize cement manufacturing.

Biography:
Dr. Jesse Benck is Vice President of Research and Development at Sublime Systems. He joined Sublime as the first full-time employee shortly after the company was founded in 2020. He now leads a team of 35 scientists, engineers, and technicians who are developing Sublime's electrochemical manufacturing process and decarbonized Sublime Cement product. Dr. Benck's career has focused on R&D in electrochemistry and materials for sustainability applications. He earned his M.S. and Ph.D. in Chemical Engineering at Stanford University in 2012 and 2015, where he studied catalysis and photo electrochemistry for sustainable solar-powered hydrogen production. He then completed two post-doctoral appointments at MIT from 2016-2018 focused on molecular transport in carbon nanomaterials for gas mixture separations and *in situ* characterization of electrochemically generated metal hydrides relevant to high-temperature fuel cells. Before joining Sublime Systems, from 2018-2020, he was a Senior Scientist and an R&D Manager at L3Harris Open Water Power, where he led R&D projects on the company's aluminum-seawater batteries for maritime power applications.

DELLA ROY LECTURE

Dr. Kimberly E. Kurtis, PhD, FACI, FACerS

Raymond Allen Jones Chair and Professor,
School of Civil and Environmental Engineering Professor (Courtesy Appointment),
School of Materials Science and Engineering Associate Dean for Faculty Development and Scholarship, College of Engineering
Georgia Institute of Technology, Atlanta, USA

Abstract:

Greening Our Gray World: Sustaining Innovation and Translating Discovery in Cement and Concrete Science

The necessity and ubiquity of concrete infrastructure demand continued innovation to meet global societal needs—equitably, sustainably, and economically—while enabling more resilient and lower-carbon development. Yet shifting global and national priorities now pose risks to the momentum of scientific and technological progress in these fields. In this lecture, I will explore how advances in cementitious materials contribute not only to technical achievement but also to broader societal goals. I will highlight three areas where sustained innovation is essential—and where my own work has focused: advancing the fundamental characterization of cement-based materials, improving performance and durability to extend service life, and harnessing data analytics to accelerate design and specification. Sustaining progress requires not only research excellence, but also strong public engagement and industry collaboration to ensure that discovery translates into meaningful, sustainable impact.

Biography:

Dr. Kimberly (Kim) E. Kurtis is the Raymond Allen Jones Chair and Professor in the School of Civil and Environmental Engineering at Georgia Institute of Technology and holds a courtesy appointment in the School of Materials Science and Engineering.

Dr. Kurtis joined Tech's faculty in January 1999. She earned her BSE (1994) in Civil Engineering from Tulane University under a Deans Honor Scholarship and her MS (1995) and PhD (1998) in Civil Engineering from the University of California at Berkeley, where she was a Henry Hilp Fellow and a National Science Foundation (NSF) Fellow. Dr. Kurtis's innovative research on the multi-scale structure and performance of cement-based materials is motivated by the broad societal need to address the global challenge of equitably providing infrastructure for all people in the most sustainable and economical ways possible. Her group's innovative work combines advanced characterization methods, novel synthesis and manufacturing approaches, and data science techniques to generate new understanding that improves the design, utilization and performance of these complex materials, resulting in more than 200 technical publications, as well as four US patents.

She has held four leadership positions – Chairman of ACI Committee 236: *Materials Science of Concrete* (2006-2012), Chair of American Ceramic Society's Cements Division (2008-2009), North American Editor *Cement and Concrete Research* (2019-present) and North American representative on the Steering Committee for the International Congress on the Chemistry of Cement (2019-present) – central to advancing science-based research on cement-based materials. In addition, Dr. Kurtis has served as Associate Editor of *ASCE Journal of Materials in Civil Engineering* and on the Editorial Board of *Cement and Concrete Composites*. She previously served the American Concrete Institute (ACI) on its Board of Directors, Technical Activities Committee and Educational Activities Committee. Her interest in translation of technological innovation into practice has prompted her membership on the Board of Directors for the minerals producer PureBase (Ione, CA) and on the Board of Advisors for the start-up Sublime Systems (Somerville, MA).

Dr. Kurtis has been honored with ACI's Walter P. Moore, Jr. Faculty Achievement Award (2005), ACI's Del Bloem Award for Service (2013), Outstanding Senior Undergraduate Research Mentor Award at Georgia Institute of Technology (2013), the ACI James Instruments Award for Research on NDE of Concrete (2008), Award for Outstanding Article in ASTM's *Journal of Testing and Evaluation* (2010), ASCE's Huber Civil Engineering Research Prize (2013), ACI's Anderson Medal (2019), and a 2020 Le Chatelier Distinguished paper award from *Cement and Concrete Research* for "Dissolution kinetics of trapped air in a spherical void: Modeling the long-term saturation of cementitious materials". She was elected to the University of California at Berkeley's CEE Academy of Distinguished Alumni in 2021. Dr. Kurtis is Fellow of ACI and the American Ceramic Society.

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NATIONAL LAB PANEL SPEAKERS

Dr. Ana Aday is a materials science researcher at the National Renewable Energy Laboratory (NREL) in the Building Technologies and Science Center, specializing in next-generation cement and concrete technologies. Dr. Aday's work focuses on developing durable construction materials, including supplementary cementitious materials, mineralization, and alternative binders, to advance innovative building applications. Dr. Aday's expertise spans material synthesis, characterization, and performance evaluation, where she leads a portfolio of cement and concrete research projects across multiple agencies. Through her research, Dr. Aday aims to provide resilient solutions for construction materials in the built environment.

Dr. Denise Silva is a researcher with Oak Ridge National Laboratory (ONRL). Her research is focused on improving the efficiency and resiliency of building materials for new constructions and retrofits. Denise has extensive experience in the field of construction materials with focus on cementitious materials. Prior to joining ORNL, she worked for 15 years for two major US companies (W.R. Grace/GCP Applied Technologies and Custom Building Products/The Quikrete Companies) in several positions and as Principal Scientist in the research and development of solutions to improve the performance and efficiency of cement-based materials via utilization of chemical admixtures. Before working in the US, Denise was a tenured professor at the Civil Engineering department of the Federal University of Santa Catarina in Brazil (UFSC). Denise received her BS and MSc degrees in Civil Engineering from the Federal University of Rio Grande do Sul (UFRGS) in Brazil, and Doctorate in Materials Science and Engineering from UFSC. A postdoctoral appointment at the Civil and Environmental Engineering department of the University of California at Berkeley followed, where she utilized the synchrotron light-sourced soft x-ray microscope at the Lawrence Berkeley National Laboratory to visualize particles of cement while hydrating in the presence of chemical admixtures.
Denise's interest include the research, development and deployment of technologies that increase efficiency and resiliency of cement-based materials, alternative binders, building materials containing natural materials, such as fibers and earth, and modular building systems.
She is a member of the American Ceramic Society (ACerS) and former chair of the Cements Division, and a member of ACI .

Dr. William Jolin is the acting manager of the Glass, Cement, and Ceramic Sciences group at Savannah River National Laboratory and technical program manager for SRNL's support of the Saltstone Production Facility at the Savannah River Site. He oversees research focusing on the immobilization of contaminants within engineered and natural environments. Prior to SRNL, Dr. Jolin served as the contaminant fate and transport subject matter expert at Savannah River Nuclear Solutions. He received a PhD from the University of Connecticut in environmental engineering before performing a postdoc at Argonne National Laboratory, where he researched wide area decontamination technologies.

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The American Ceramic Society ceramics.org

AIST Association for Iron & Steel Technology

TMS The Minerals, Metals & Materials Society

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POSTER SESSIONS

ABSTRACT #3375
Fresh properties of biochar-amended concrete

Fatemeh Hamidi, Colorado School of Mines, Golden, CO and Lori Tunstall, Colorado School of Mines, Golden, CO

ABSTRACT #3381
Sustainable and affordable 3D printable concrete using quarry by-products

Anasuya Kamakshi Tippabhotla, Aidyn Tugelbayev, Bao Chau, Anderw P. McCoy and Alexander S. Brand, Virginia Tech, Blacksburg, VA

ABSTRACT #3382
Microstructural evolution and phase development in ultra-low clinker cement: A thermodynamic and experimental study

Abiodun Saka and Monday U. Okoronkwo, Missouri University of Science and Technology, Rolla, MO

ABSTRACT #3412
X-ray reflectivity as a tool to study dissolution kinetics of calcium silicates

Aidyn Tugelbayev and Alexander S. Brand, Virginia Tech, Blacksburg, VA

ABSTRACT #3438
LC3-like systems made with U.S. blends of Portland limestone cement and calcined clays

Paola Huynh, Maria Juenger, and Thien Tran, University of Texas at Austin, Austin, TX, Kejin Wang, Iowa State University, Ames, IA, and Kimberly E. Kurtis and Daniel J Benkeser, Georgia Institute of Technology, Atlanta, GA

ABSTRACT #3465
Self-healing efficiency of artificial mineral aggregates in lime-pozzolana binder systems.

Adhora Tahsin and Warda Ashraf, The University of Texas at Arlington, Arlington, TX

ABSTRACT #3468
FAST-CO_2: Facilitating accelerated strength and transformation of concrete via regulated CO_2 mineralization with lime

Christie Arrington, Monica Amaral, and Jialai Wang, The University of Alabama, Tuscaloosa, AL

ABSTRACT #3470
Morphological control of magnesium silicate hydrates during aqueous synthesis

Vikram Gopalan and Erika La Plante, UC Davis, Davis, CA

ABSTRACT #3477
Optimizing clay mineral dehydroxylation for energy-efficient supplementary cementitious material production: A kinetic and mechanistic approach.

Oluwadamilare Charles Adesina, Sayee Srikarah Volaity, and Narayanan Neithalath, Arizona State University, Tempe, AZ, Bryan K Aylas-Paredes and Aditya Kumar, Missouri University of Science and Technology, Rolla, MO, and Chengqing Qi, Ash Grove Cement Company, Overland Park

ABSTRACT #3481
Impact of calcium sources and bacterial strains on biomineralization-induced degradation of portland cement paste

Cansu Acarturk, Caitlin J. Adams, Isabel Popke Russell and Wil V. Srubar III, University of Colorado Boulder, Boulder, CO

ABSTRACT #3483
Understanding phase evolution in hydrating belitic calcium sulfoaluminate cements via raman imaging

Momina Rauf and Nishant Garg, University of Illinois Urbana Champaign, Urbana, IL

ABSTRACT #3485
Evaluating the suitability of emerging low-carbon materials as viable cement replacements

Abigail I Kienzle and Sriramya D Nair, Cornell University, Ithaca, NY

POSTER SESSIONS

ABSTRACT #3486
Role of aggregate packing in enhancing concrete fracture response: Insights from in-situ high-speed imaging

Nischal Kanel, Bayezid Baten and Nishant Garg, University of Illinois Urbana Champaign, Urbana, IL

ABSTRACT #3489
Using 4D x-ray micro-CT to study self-healing in fiber-reinforced mortar containing fine olivine sand

Kaina Rodrigues Vieira and Laura E. Dalton, Duke University, Durham, NC

ABSTRACT #3496
Value-added application of biochar for sustainable concrete pavement: Laboratory study and field demonstration

Jialuo He, Washington State University, Pullman, WA, **Xianming Shi**, University of Miami, Coral Gables, FL and James Amonette, Pacific Northwest National Laboratory, Tri-Cities, WA

ABSTRACT #3500
Evaluating the effectiveness of grinding aids and their water reducing capabilities for one-part alkali-activated calcined clay

Yangwoo Lee and Claire E. White, Princeton University, Princeton, NJ

ABSTRACT #3506
Enhancing strength and reducing porosity via nucleation seeding

Faisal Qadri and Nishant Garg, University of Illinois Urbana Champaign, Urbana, IL

ABSTRACT #3510
Stereochemical biomimicry in cement science: Unraveling organic-inorganic interactions in calcium-silicate-hydrate formation

Sondos Hlayhel, Zahra Rouzitalab, Sarah Hlaihel, and Konrad J Krakowiak Dr., University of Houston, Houston, TX

ABSTRACT #3514
CO_2 mineralization using MSWI ash as a low-carbon pathway of producing supplementary cementitious materials

Farzana Mustari Nishat and Warda Ashraf, The University of Texas at Arlington, Arlington, TX

ABSTRACT #3526
Optimizing the CO_2 uptake and strength of foamed cellular concrete

Aysan Farajnia and Nishant Garg, University of Illinois Urbana Champaign, Urbana, IL

ABSTRACT #3529
Time-dependent rheological behavior of cement paste containing calcined clay with respect to water-to-cement ratio

Sudipto Sarkar, Farzana Mustari Nishat, Nishad Ahmed and Warda Ashraf, The University of Texas at Arlington, Arlington, TX

ABSTRACT #3530
Sustainable geopolymer concrete: Optimizing calcined clay and hemp hurd for green construction

Christopher Vreeland and Maryam Hojati, University of New Mexico, Albuquerque, NM

ABSTRACT #3533
Onset heat size index – a parameter to predict the rheology of calcined clays

Muhammad Farjad Iqbal and Nishant Garg, University of Illinois Urbana Champaign, Urbana, IL

ABSTRACT #3538
Carbonated recycled cement paste: CO_2 uptake and reactivity

Kingshuk Mukherjee and Prannoy Suraneni, University of Miami, Coral Gables, FL

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POSTER SESSIONS

ABSTRACT #3552
Rheological and mechanical properties of carbon-negative 3D printed concrete using functionalized biochar

Nishad Ahmed and Warda Ashraf, The University of Texas at Arlington, Arlington, TX

ABSTRACT #3559
Raman imaging for advanced characterization: From cement hydration to ASR

Chirayu Kothari and Nishant Garg, University of Illinois Urbana Champaign, Urbana, IL

ABSTRACT #3567
Enhancing the reactivity of belite via foreign dopants

Hyeonseok Jee and Nishant Garg, University of Illinois Urbana Champaign, Urbana, IL

ABSTRACT #3572
Closing the silica loop in concrete recycling: High performance silica gel synthesized from hardened cement paste.

Abdulmaliq Alawode, Jialai Wang, Xiaodong Wang, Xi Chen, Maysam Bahmani, Monica Amaral and Aniket Patnaik, The University of Alabama, Tuscaloosa, AL

ABSTRACT #3585
Measuring total sulfur content of reactive aggregates using electron probe microanalysis free from matrix interference.

Dip Banik and Alexander S. Brand, Virginia Tech, Blacksburg, VA

ABSTRACT #3586
Early age strength enhancement of high SCM mixes

Muhammad Ayyan Iqbal, Bayezid Baten and Nishant Garg, University of Illinois Urbana Champaign, Urbana, IL

ABSTRACT #3592
Development of 3D printable lightweight concrete with granulated cork: A novel mixture design method considering aggregate water absorption in cementitious suspensions and rheological performance

Hanbin Cheng, Aleksandra Radlińska, Jose Pinto Duarte, Ali M. Memari, and Sven Bilén, Pennsylvania State University

ABSTRACT #3601
Effectiveness of ground tire rubber to replace air-entraining agents to mitigate freeze-thaw damage in pavement concrete

Samantha Young, John Myers, and Dimitri Feys, Missouri University of Science and Technology, Rolla, MO, Parisa Nemati and Ceki Halmen, University of Missouri Kansas-City, Kansas-City, MO and John Kevern, University of Missouri Kansas-City, Kansas-City, MO and National Renewable Energy Laboratory, Golden, CO

ABSTRACT #3611
Exploring biopolymer-coated channels for microbial encapsulation in self-healing concrete

Sarah J. Willmann, University of Colorado Boulder, Boulder, CO and Duke University, Durham, NC, and Caitlin J. Adams, Samuel J. Armistead and Wil V. Srubar III, University of Colorado Boulder, Boulder, CO

ABSTRACT #3612
Scalable and transportable thermochemical energy storage using cementitious materials

Paul Ginsberg, Lakshmi Amulya Nimmagadda and Arpit Dwivedi, Cache Energy

ABSTRACT #3619
Effect of y-type zeolites on gaseous mineralization in portland cement

Angus B Moore, Atolo A Tuinukuafe and Jessica M Rimsza, Sandia National Laboratories, Albuquerque, NM

POSTER SESSIONS

ABSTRACT #3623
Aggreplex's PozzoDyne™ – an activated ground glass pozzolan (AGGP) – supplementary cementitious material (SCM)

Anthony M. Cialone, AggrePlex LLC, Naples, FL

ABSTRACT #3624
Investigating the effect of high and very high amount of scms on CO_2 uptake of mortars

Iman Aghajanzadeh, Montale Tuen, Prannoy Suraneni and Landolf Rhode-Barbarigos, University of Miami, Coral Gables, FL

ABSTRACT #3625
Evaluating the effect of waste bovine bone as a fine aggregate substitute in cement mortar

Lamiya Noor and Wil V. Srubar III, University of Colorado Boulder, Boulder, CO

ABSTRACT #3634
Practical implementation of superabsorbent polymers (SAP) for internally cured concrete

Kendra A. Erk, Chibueze Ajuonuma, Raikhan Tokpatayeva, and Jan Olek, Purdue University, West Lafayette, IN

ABSTRACT #3644
Magnesium effects on clinker composition and reactivity

Angélica Giraldo-Salazar, Pablo Romero and Nishant Garg, University of Illinois at Urbana-Champaign, Urbana, IL,

ABSTRACT #3647
Understanding impact of calcination time on clay dehydroxylation via in-situ TEM

Tausif E Elahi, Pablo Romero and Nishant Garg, University of Illinois at Urbana-Champaign, Urbana, IL,

ABSTRACT #3653
Preliminary study on real-time monitoring of bulk water movement in subzero-exposed portland cement concrete microstructure using neutron radiography

Md Hasibul Hasan Rahat, Dip Banik, Sepehr Akhtarshenas, Sherif L. Abdelaziz, and Alexander S. Brand, Virginia Tech, Blacksburg, VA, and James R. Torres and Yuxuan Zhang, Oak Ridge National Laboratory, Oakridge, TN, and Stefan Jacobsen, Norwegian University of Science and Technology, Trondheim, Norway

ABSTRACT #3660
Roles of tannic acid in the carbonation process of cement slurry

Xiaodong Wang, Monica Amaral, Abdulmaliq Alawode, Xi Chen, Maysam Bahmani and Jialai Wang, The University of Alabama, Tuscaloosa, AL

ABSTRACT #3661
Enhanced CO_2 sequestration and strength of cementitious materials using a cost-effective renewable admixture

Aniket Patnaik, Jialai Wang and Monica Amaral, The University of Alabama, Tuscaloosa, AL

ABSTRACT #3663
Exploring the impact of carbonation in uncalcined and calcined clay-cement composites

Brittney D Seaburn, Chven Mitchell, Melissa Mills and Jessica M Rimsza, Sandia National Laboratories, Albuquerque, NM

ABSTRACT #3665
A review of embodied carbon emissions and carbon sequestration potential of biochar-modified concrete

Austin Dada and Wil V. Srubar III, University of Colorado, Boulder, Boulder, CO

ABSTRACT #3670
Effects of nano-ettringite on the carbonation resistance of ordinary portland cement (OPC) and calcium sulfoaluminate (CSA) cement pastes

Rupack R. Halder, Titus C. Egbosiuba, Hongyan Ma and Monday U. Okoronkwo, Missouri University of Science and Technology, Rolla, MO

POSTER SESSIONS

ABSTRACT #3672
Methane Pyrolysis-coproduced Carbon Nanotubes in Cementitious Materials toward Sustainable Construction and Hydrogen Production

Stuart McElhany, Anushree Konwar, Xiaohong Zhu, Carlo Carraro, Roya Maboudian and Paulo J.M. Monteiro, University of California, Berkeley, Berkeley, CA

ABSTRACT #3673
Creep-induced atomic structural changes in hydrated tricalcium silicate and alkali-activated slag

Claire E. White, Abdelrahman Hamdan, Joseph Vocaturo, Brendan Kehoe, Princeton University, Princeton, NJ, Nishant Garg, University of Illinois Urbana Champaign, Urbana, IL, Joerg C Neuefeind and S. Michelle Everett, Oak Ridge National Laboratory, Oak Ridge, TN, Daniel Olds, Brookhaven National Laboratory, Upton, NY and Katharine L. Page, Oak Ridge National Laboratory, Oak Ridge, and University of Tennessee, Knoxville, TN


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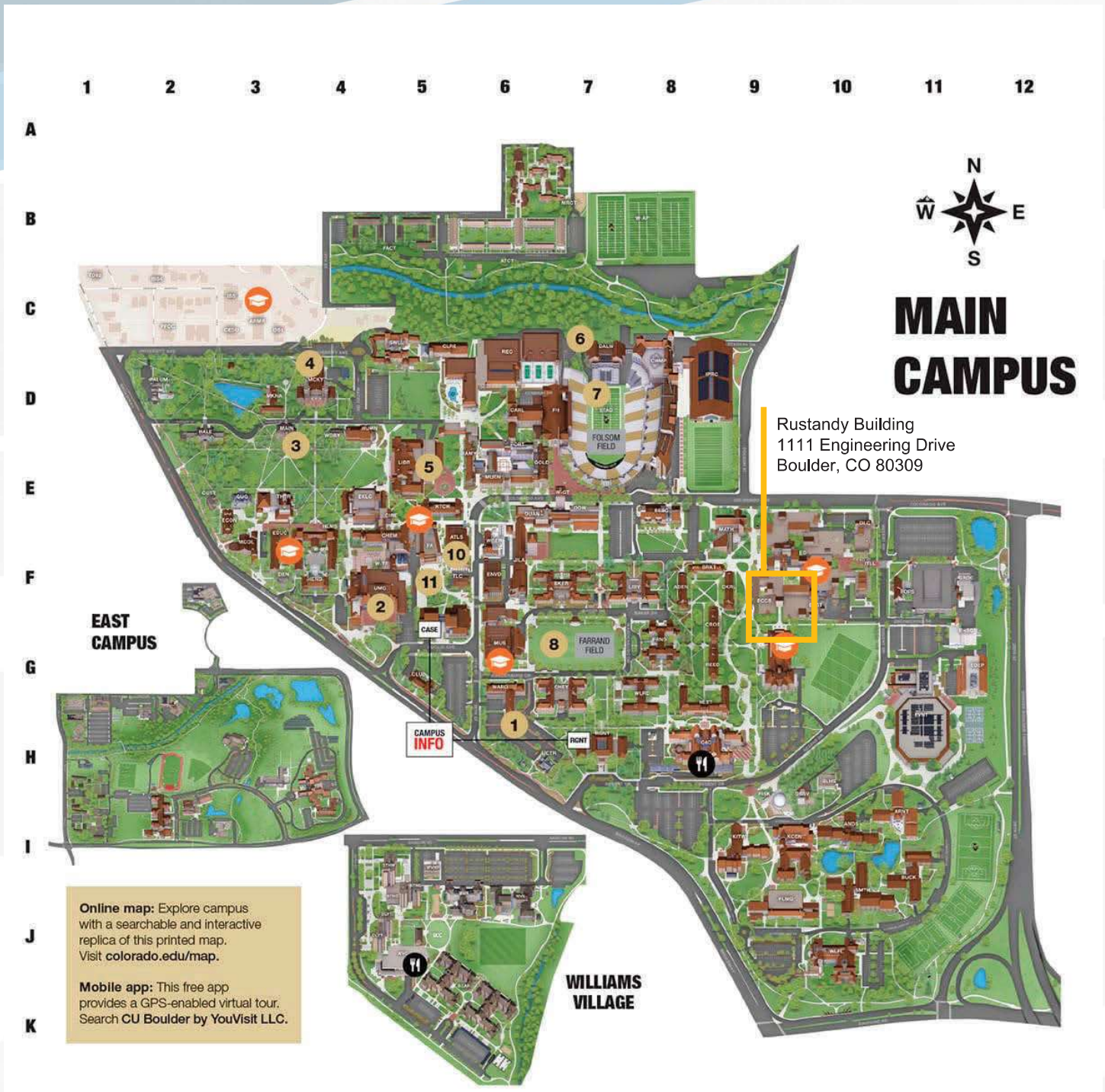

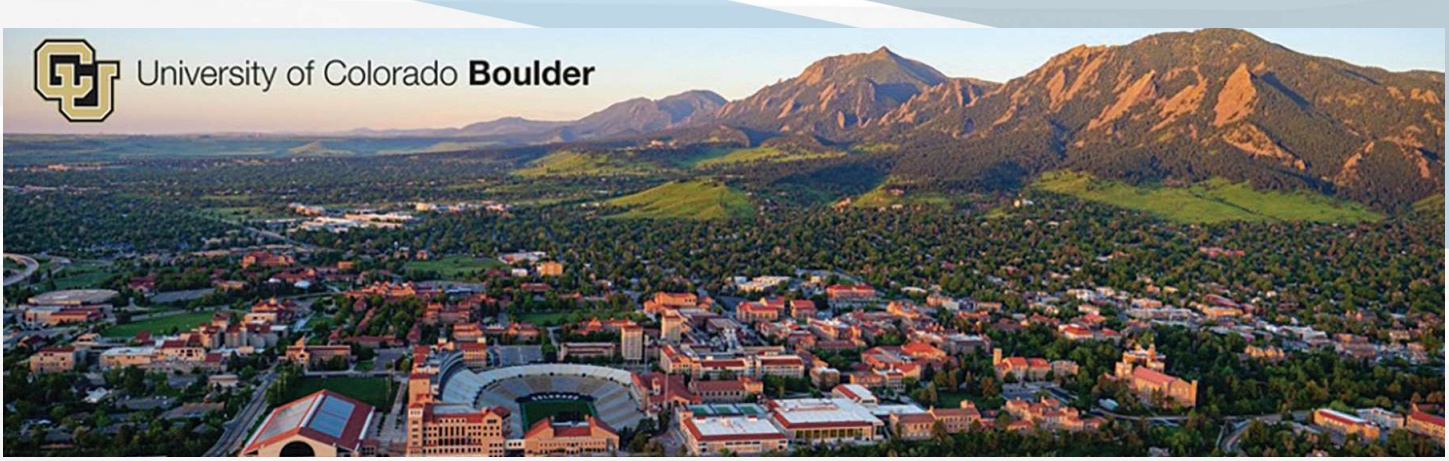

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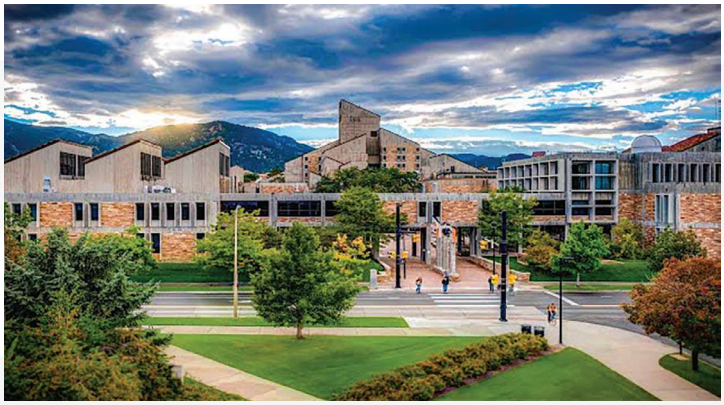

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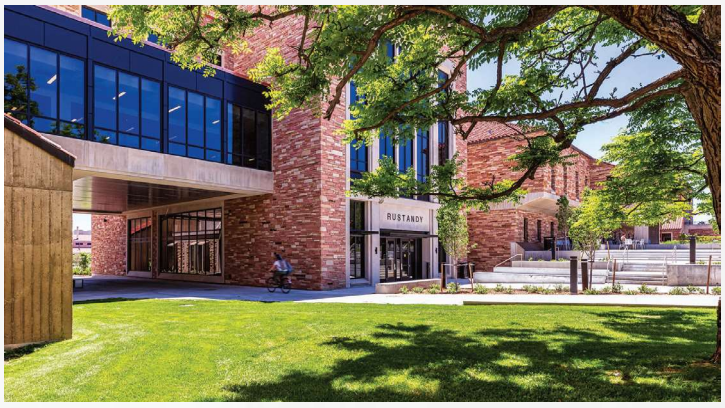

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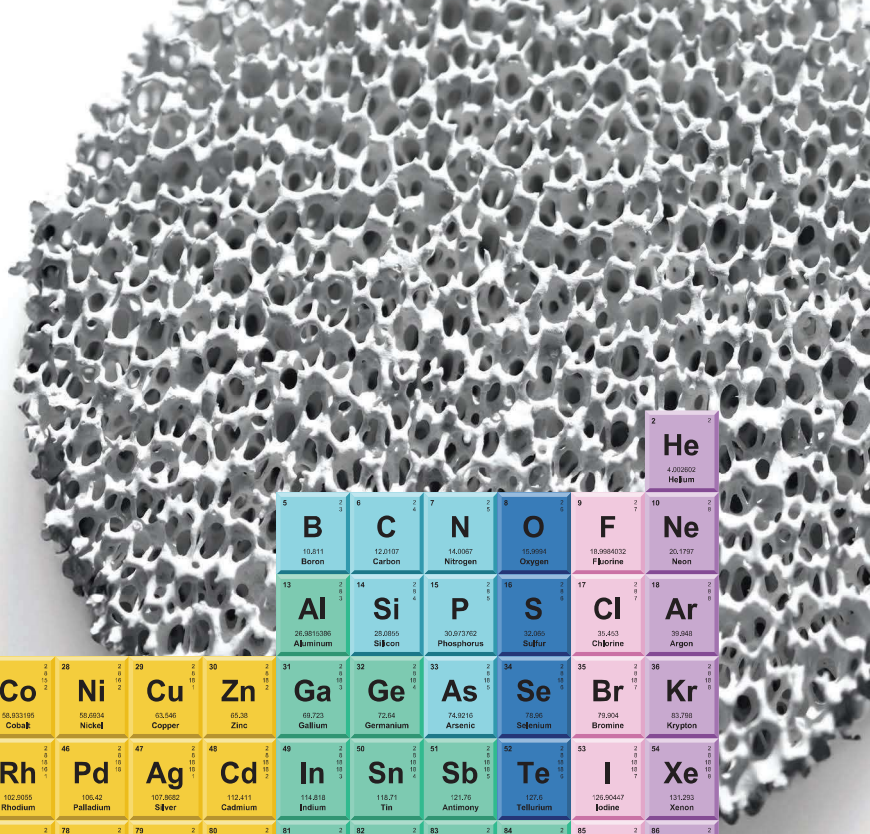

Photo: Ceramic sponge (nanoscale morphology) produced from American Elements proprietary ultra high surface area powder

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