50TH

The American Ceramic Society
ceramics.org

GOLDEN Jubilee Celebration of the 50th International Conference and Expo on Advanced Ceramics and Composites (ICACC 2026)

CALL FOR PAPERS

Hilton Daytona Beach Oceanfront Resort
Daytona Beach, Florida, USA

January 25-30, 2026

Abstracts due September 2, 2025

Organized by:
The Engineering Ceramics Division
of The American Ceramic Society

ceramics.org/icacc2026

WELCOME

We would like to warmly welcome you to the 50th International Conference and Exposition on Advanced Ceramics and Composites (ICACC 2026) in Daytona Beach, Florida. Since its inception in 1977, this prestigious conference has been organized by the Engineering Ceramics Division (ECD) of the American Ceramic Society (ACerS). Over the years, the conference has experienced significant growth in interest and participation from researchers, educators, technology developers, manufacturers, and end-users worldwide.

As one of several events celebrating this anniversary during ICACC 2026, a special Golden Jubilee Symposium, entitled "Engineered Ceramics for Achieving Net-Zero Carbon Emissions" is being organized. This symposium will feature previous ECD James I. Mueller, Mrityunjay Singh Bridge Building, Jubilee Global Excellence, and Global Young Investigator Award winners, past and current ECD officers, and past ICACC plenary speakers. All the invited speakers will deliver presentations on the current status and prospects of various technical topics related to advanced ceramics and composites, as well as the 50-year journey of ceramics and composites at Cocoa Beach/Daytona Beach.

The 50th ICACC provides a platform for state-of-the-art presentations and information exchange on cutting-edge ceramic and composite technologies. The technical program of ICACC 2026 consists of nineteen Symposia, six Focused Sessions, one Special Focused Session on Entrepreneurship and Commercialization, a Golden Jubilee Symposium and the 15th Global Young Investigator Forum. The well-established nineteen symposia at this conference include Thermoelectric and Thermionic Energy Conversion, Mechanical Behavior of Ceramics and Composites, Advanced Ceramic Coatings, Solid Oxide Cells, Bioceramics, Materials for Rechargeable Energy Storage, Nanomaterials for Energy Harvesting, Advanced Processing and Manufacturing Technologies, Porous Ceramics, Modeling and Design, Production Root Technologies, Nanolaminated Ternary Carbides/Nitrides, Nuclear Materials, Optical Materials, Additive Manufacturing, Geopolymers, Photonics, Ultra-High Temperature Ceramics, and Molecular-level Processing and Chemical Engineering. In addition to the core symposia, the technical program will include six Focused Sessions on emerging technologies: Bioinspiration and Green Processing, Ceramics to shape the Future of Low-Carbon and Carbon-Negative Technologies, Innovative Material Processing for Diverse Resource Circulation Loops, Smart Powder Processing of Multifunctional Ceramics and Catalysts, Ceramic/Carbon Reinforced Polymers and High-Voltage Materials for Advanced Electrical Applications.

The 15th Global Young Investigator Forum aims to bring together students, young professionals, and early-career faculty from around the world to showcase their research and promote scientific discussions that identify and tackle emerging global challenges. The Special Focused Session on Entrepreneurship and Commercialization explores the essential skills and attributes that define successful materials engineers and scientists in today's dynamic landscape, fostering job creation, innovation, and career development and offering unparalleled opportunities for growth and impact.

Like last year, poster presenters have the opportunity to present a two-minute summary of their research. Over 50 presenters have taken advantage of this new opportunity at the end of a daily session.

The ICACC Exposition will be held on Tuesday and Wednesday evenings at the adjacent Ocean Center, providing a platform for attendees to connect with business partners and explore new business opportunities, view new materials, processing and characterization tools, and products. The poster session will be held in conjunction with the Exposition.

The ECD Executive Committee, ICACC Programming Committee, and volunteer organizers, together with The American Ceramic Society, would like to thank you for joining us for this stimulating and beneficial experience. Finally, I would like to express our gratitude to our industrial sponsors as well as to many other partners and exhibitors. We look forward to seeing you in Daytona Beach, Fl, in January 2026.

Federico Smeacetto
Politecnico di Torino, Italy
Program Chair, ICACC 2026

TENTATIVE SCHEDULE OF EVENTS

The American Ceramic Society
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SUNDAY, JANUARY 25, 2026

Conference Registration	2 – 7 p.m.
Member and Publication Center	2 – 7 p.m.
Speaker Ready Room	2 – 7 p.m.
Welcome Reception	5:30 – 7 p.m.

MONDAY, JANUARY 26, 2026

Conference Registration	7 a.m. – 5:30 p.m.
Member and Publication Center	7 a.m. – 6 p.m.
Speaker Ready Room	8 a.m. – 4 p.m.
Opening Awards Ceremony & Plenary Session	8:30 a.m. – Noon
Coffee Break	10:10 – 10:40 a.m.
Sponsored Lunch for Attendees	Noon – 1:20 p.m.
Concurrent Technical Sessions	1:30 – 5:30 p.m.
Coffee Break	3 – 3:20 p.m.

TUESDAY, JANUARY 27, 2026

Conference Registration	7:30 a.m. – 5:30 p.m.
Member and Publication Center	7:30 a.m. – 6 p.m.
Speaker Ready Room	8 a.m. – 4 p.m.
Concurrent Technical Sessions	8:30 a.m. – Noon
Coffee Break	10 – 10:20 a.m.
Exhibitor Set-up	Noon – 4 p.m.
Lunch On Own	Noon – 1:20 p.m.
Concurrent Technical Sessions	1:30 – 5:30 p.m.
Coffee Break	3 – 3:20 p.m.
Poster Session Set-up	3 – 4:30 p.m.
Exhibits & Poster Session Including Reception	5 – 8 p.m.

HILTON DAYTONA BEACH OCEANFRONT RESORT

100 N Atlantic Ave, Daytona Beach, FL 32118
Phone: (386) 254-8200

Cut-off date for reservations: December 26, 2025

Attendee Block: $193 a night plus tax plus a $25 a night resort fee; total $218 a night plus tax
Book your attendee rate room here: American Ceramic Society 2026

Student Room Block: $156 a night plus tax plus a $25 a night resort fee; total $181 a night plus tax. Must present a student ID upon check-in for student rate.
Book your student rate room here: ACerS Student Block

ABSTRACT SUBMISSION INSTRUCTIONS

Visit https://icacc2026.abstractcentral.com/ to review session topics. Select "Submit Abstract" to be directed to the Abstract Central website.

Abstract title plus text total character limit (including spaces) is 1,500 characters.

If you have questions, please contact Karen McCurdy at kmccurdy@ceramics.org

WEDNESDAY, JANUARY 28, 2026

Conference Registration	7:30 a.m. – 5:30 p.m.
Member and Publication Center	7:30 a.m. – 5:30 p.m.
Speaker Ready Room	8 a.m. – 4 p.m.
Concurrent Technical Sessions	8:30 a.m. – Noon
Lunch On Own	Noon – 1:20 p.m.
Concurrent Technical Sessions	1:30 – 5:30 p.m.
Coffee Break	3 – 3:20 p.m.
Exhibits & Poster Session Including Reception	5 – 7:30 p.m.

THURSDAY, JANUARY 29, 2026

Conference Registration	7:30 a.m. – 5:30 p.m.
Member and Publication Center	7:30 a.m. – 5:30 p.m.
Speaker Ready Room	8 a.m. – 4 p.m.
Concurrent Technical Sessions	8:30 a.m. – Noon
Lunch On Own	Noon – 1:20 p.m.
Concurrent Technical Sessions	1:30 – 5:30 p.m.
Coffee Break	3 – 3:20 p.m.
Last Night Reception	5:30 – 6:30 p.m.
Golden Jubilee Celebration Dinner (ticketed event)	6:30 - 9 p.m.

FRIDAY, JANUARY 30, 2026

Conference Registration	8 a.m. – Noon
Concurrent Technical Sessions	8:30 a.m. – Noon
Coffee Break	10 – 10:20 a.m.

ACerS Engineering Ceramics Division Leadership

Chair:
Jie Zhang | *Institute of Metal Research, China*
Chair-elect:
Amjad Almansour | *NASA Glenn Research Center, USA*
Vice-chair/Treasurer:
Federico Smeacetto | *Politecnico di Torina, Italy*
Secretary:
Yuki Nakashima | *National Institute of Advanced Industrial Science and Technology, Japan*
Trustee (2024-2027):
Michael C. Halbig | *NASA Glenn Research Center, USA*
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Palani Balaya | *National University of Singapore;*
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ACerS Board of Directors Division Liaison:
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Christine Brockman | *Oklahoma State University, USA;*
Imoen Hawthorne | *University of Virginia, USA*
DEI Subcommittee representative:
Federico Smeacetto | *Politecnico di Torino, Italy*
Panel of Fellows representative (2024-2027):
Dileep Singh | *Argonne National Laboratory, USA*

SPECIAL EVENTS
AT ICACC 2026!
NEW IN PROGRAMMING FOR 2026!

The American Ceramic Society
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ICACC 2026 will offer a number of special events to not only encourage invaluable networking opportunities with colleagues, but also help to supplement your travel budget! ICACC 2026 registration includes four evening receptions with food and drink provided, as well as two coffee breaks per day, a diversity luncheon on Thursday and an additional evening reception for students and young professionals. The host hotel, the Hilton Daytona Beach, will also offer lunch specials for conference attendees.

Welcome Reception
Network with colleagues at the reception and enjoy food, drink and live entertainment at the kick-off event.

ACerS Student and Young Professional Networking Mixer
Join fellow students and young professionals for food and drink at the student and young professionals networking event.

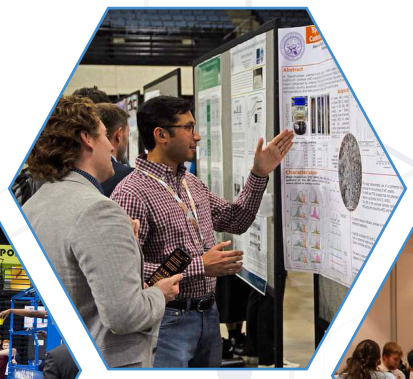
Shot Glass Contest
Organized by ACerS President's Council of Student Advisors (PCSA), test your skills with this design contest! Competing teams of four will be given 15 pipe cleaners to build a protective device for their shot glass provided by SCHOTT. Then, the glasses will be dropped from increasing heights until the breaking threshold is reached. The glass with the highest successful drop distance wins!

Last Night Reception with Contest
Recap the week's excitement with your colleagues and
friends. Join in the trivia contest to win some great prizes!

Expo and Poster Session
Visit with vendors from the ceramic and glass industry and check out scientific posters!

Poster Session Preview
At ICACC 2026, poster presenters will have the opportunity to make a two-minute "Poster Preview Pitch" in front of their colleagues at the end of their respective technical session each day, in addition to presenting their poster in the two-day poster session. This is optional and poster authors can indicate their interest in participation when submitting their abstract in Scholar One.

Golden Jubilee Celebration Dinner
Join your colleagues for a night of celebration in honor of ICACC. Dinner and drinks will be provided, as well as live entertainment and remarks from ICACC organizers, past and present. This wonderful celebration of 50 years of ICACC will be a ticketed event.



NOTE TO PRESENTERS
Important information

- It is unavoidable that some symposia and presentations will be scheduled for the last day of the conference. Please refrain from making flight reservations or travel arrangements until your presentation has been scheduled. If you are unable to present on your assigned day, ACerS cannot guarantee we will be able to reschedule your presentation. Special requests for specific presentation times and dates are discouraged.

- Due to the costs associated with hosting a professional scientific conference, ACerS does not offer complimentary or discounted registration for this meeting. All attendees, to include our invited speakers and students, are expected to register for the event through our registration system at the appropriate rate. All student attendees will be asked to show a valid student ID to retrieve their badges on site.

SYMPOSIUM 1

Mechanical Behavior and Performance of Advanced Ceramics & Composites

Advanced structural ceramics, cermets and ceramic matrix composites (CMCs) are enabling materials for applications in various industries such as energy generation and storage (eg. concentrated solar power, nuclear, combustion, batteries), extreme environment, space, transportation, medicine, microelectronics, and optical systems. High mechanical reliability is a key issue for their ultimate use in short- to very long-term applications. Identification and quantification of failure mechanisms by fracture, creep, fatigue and/or irreversible deformation are essential, and their correlation with structure, processing, and exposure to severe service conditions. Extreme environments and challenging applications have necessitated new approaches for sustainable manufacturing and characterization of ceramic materials. The development of novel methods to advance and accelerate computationally driven materials characterization and validate structure/property relationship and multiscale models is needed to improve predictions of material behavior, lower costs and consider sustainability and life cycle assessment. This symposium solicits abstracts related to the diverse aspects of mechanical behavior of ceramics and composites and their correlations with processing, component performance and reliability.

Proposed Session Topics

- Mechanical characterization of ceramics and composites, techniques & equipment
- Small-scale testing and in-situ characterization using electrons, photons & neutrons
- Fracture mechanics, failure analysis and fractography
- Environmental effects, thermo-mechanical creep, fatigue performance and tribology
- Design, reliability and life prediction modeling of materials, devices and components
- Novel computational approaches to enhance performance and characterization
- Processing - microstructure - mechanical properties correlation
- Role of fibers, matrices, coatings, and interfaces in mechanical behavior
- Functionally graded materials and multilayer ceramic systems
- Manufacturing and testing of joined and integrated components and structures
- Ceramics for aerospace and other transport applications
- Ceramics for energy generation, turbines, and environmental applications
- Ceramics for concentrated solar-thermal power and industrial process heat
- Correlation of resource efficient processing of ceramics and CMCs with their performance

Symposium Organizers

- Amjad Almansour, NASA Glenn Research Center, USA
- Dong (Lilly) Liu, University of Oxford, UK
- Jonathan Salem, NASA Glenn Research Center, USA
- Monica Ferraris, Politecnico di Torino, Italy
- Gerard L. Vignoles, University of Bordeaux, France
- Dileep Singh, Argonne National Laboratory, USA
- Craig Przybyla, Air Force Research Laboratory, USA
- Dietmar Koch, University of Augsburg, Germany
- Bob Zhou, GE Aerospace, USA
- Kamala Raghavan, U.S. Department of Energy, USA
- Stefan Schafföner, University of Bayreuth, Germany
- Fredric Laurin, Onera, Paris, France
- Stefano De la Pierre, Politecnico di Torino, Italy
- Koshika Pandey, Politecnico di Torino, Italy

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SYMPOSIUM 2

Advanced Ceramic Coatings for Structural, Environmental, and Functional Applications

High-performance ceramic coating systems are key to current and future technologies. Ceramic coatings extend lifetime or even enable operation of engineering materials in harsh environments. Advanced gas turbine engine components made of ceramic matrix composites, intermetallics, or superalloys promise higher energy efficiency due to increasing operation temperatures. Advanced thermal and environmental barrier coatings (T/EBC) are mandatory to protect components against the synergistic attack of heat, combustion atmosphere, and inorganic, CMAS-type aerosols. Oxidation protection provided by ceramic coatings is crucial for non-oxide, ultra-high temperature ceramics and composites to be used in reusable spacecraft or hypersonic vehicles. Protection of metal components against oxidation, corrosion, erosion, and wear by innovative ceramic coatings is also a central building block for many other technologies. Functional ceramic coatings are essential for many renewable energy applications.

The symposium addresses R&I in the fields of processing, microstructure, performance, and durability of advanced ceramic coatings. New materials, innovative processing technologies, advanced characterization methods, and modeling are particularly emphasized. Material scientists and engineers from around the world are invited to present and discuss cutting-edge ceramic coating science and technology.

Proposed Topics

- Thermal and environmental barrier coatings for CMC, intermetallics, and alloys
- CMAS-type degradation of T/EBC: Fundamentals, modeling, and mitigation strategies
- Ceramic coatings for protection against oxidation, corrosion, erosion, and wear
- Ceramic coatings for renewable energy applications
- Processing of ceramic coatings (thermal spraying, PVD, CVD, aerosol-, polymer-, and powder-deposition and sintering)
- Microstructure-property relationships
- Advanced destructive and non-destructive characterization methods
- Modeling and simulation
- New coating materials - MAX phases, high-entropy phases, etc.

Symposium Organizers

- Peter Mechnich, German Aerospace Center (DLR), Germany
- Douglas E. Wolfe, The Pennsylvania State University, USA
- Jie Zhang, Institute of Metal Research, CAS, China
- Bryan Harder, NASA Glenn Research Center, USA
- Elizabeth Opila, University of Virginia, USA
- Ravisankar Naraparaju, German Aerospace Center (DLR), Germany
- Nadia Rohbeck, Pratt and Whitney, USA
- Kuiying Chen, NRC Ottawa, Canada
- Kang N. Lee, NASA Glenn Research Center, USA
- Eric H. Jordan, University of Connecticut, USA
- Robert Vaßen, Forschungszentrum Jülich, Germany
- Julin Wan, GE Global Research, USA
- Satoshi Kitaoka, Japan Fine Ceramics Center, Japan
- Byung-Koog Jang, Kyushu University, Japan
- David Poerschke, University of Minnesota, USA
- Ping Xiao, University of Manchester, UK
- Rodney W. Trice, Purdue University, USA
- Yutaka Kagawa, The University of Tokyo, Japan

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- Peter Mechnich: peter.mechnich@dlr.de
- Doug Wolfe: dew125@psu.edu
- Jie Zhang: jiezhang@imr.ac.cn

SYMPOSIUM 3

23rd International Symposium on Solid Oxide Cells (SOC): Materials, Science and Technology

Solid oxide cells (SOCs) offer great potential for clean and efficient power generation from a wide variety of fuels ranging from hydrocarbons to renewables and for highly efficient conversion of electricity to hydrogen or synthesis gas via electrolysis. Durable electrochemical energy conversion in SOC is only possible by proper material choice and processing, cells stacking technologies and stack module design. Application of SOC in scalable systems for power, heat, hydrogen and synthetic gas generation requires serious consideration of the stack operating window, operating environment, contaminants sources/level and customer specifications to realize competitive solutions.

This symposium provides an excellent platform for academia and industry to present and discuss novel solutions for materials, components design, mechanical robustness, durability, system layouts and exchange their experience in application of SOCs in different areas. The goal of the symposium is not only the exchange of recent results by experienced and young scientists but also extensive discussion of unsolved problems and development directions.

Proposed Session Topics

- Electrolytes and ionic conductors: oxygen ion, proton and mixed conductors; conduction mechanisms and material development
- Electrode materials and interfaces: electrode processes, defect chemistry, microstructural engineering, surface and interfacial reactions, poisoning, degradation mechanisms, accelerated testing and characterization
- Interconnects, seals and joining technologies: ceramic/metallic interconnects; sealing and brazing technologies; materials development, coatings, interactions, and reliability
- Cell and stack design, processing, and fabrication: novel manufacturing methods for cells, stacks, reformers, burners and other system components; integration strategies
- Mechanical and thermomechanical properties: mechanical integrity and durability of materials and components under high-temperature operation, thermal and redox cycles
- Modelling and simulation: electrochemical performance, thermomechanical stresses and degradation modelling; simulation of temperature distribution, stress, and current distribution in cells, stacks, and systems
- High-temperature electrolysis and process engineering: steam and CO_2 electrolysis, system integration and chemical process engineering
- System design, integration and demonstration: system architecture, layout, dynamic operation, and performance in real-world applications

Symposium Organizers

- Tae Ho Shin, Korea Institute of Ceramic Engineering & Technology, Republic of Korea (lead organizer)
- Mihails Kusnezoff, Fraunhofer IKTS, Germany
- Federico Smeacetto, Politecnico di Torino, Italy
- Scott A. Barnett, Northwestern University, USA
- John Hardy, Pacific Northwest National Laboratory, USA
- Olga Marina, Pacific Northwest National Laboratory, USA
- Henrik Lund Frandsen, DTU Energy Conversion and Storage, Denmark
- Prabhakar Singh, University of Connecticut, USA
- Sebastian Molin, Gdansk University of Technology, Poland
- Julie Mougin, CEA, France
- Vincenzo Esposito, DTU Energy Conversion and Storage, Denmark
- Ruey-Yi Lee, Institute of Nuclear Energy Research, Taiwan
- Tatsumi Ishihara, Kyushu University, Japan
- Toshiaki Matsui, Kyoto University, Japan
- Aline Leon, European Institute for Energy Research, Germany
- Luca Mastropasqua, University of Wisconsin, Madison, USA
- Xingbo Liu, West Virginia University, USA

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- John Hardy: John.Hardy@pnnl.gov

Advanced Materials for Thermoelectric and Thermionic Energy Conversion

Thermoelectric power generation relies on a thermally induced electrical current in an all-solid-state device. Thermionic energy conversion also utilizes a temperature gradient to generate an electrical current; however, the materials research and device applications are still underdeveloped compared to those in thermoelectrics. In both heat-to-electricity direct energy conversion technologies, the useful power and power conversion efficiency depend on the transport of charge carriers (electrons or holes) and the propagation of lattice vibrations (phonons) in the materials involved. Broader applications of thermoelectric and thermionic devices can be expected if new materials can be developed and assembled to reliably meet the requirements under various environments and duty loads. Deeper insight into mechanisms through novel theoretical concepts and advanced manufacturing techniques is needed to achieve a breakthrough in thermoelectric and thermionic materials and devices, which enables a far greater figure of merit and higher power factor than those of currently available counterparts. Computational sciences, including machine learning, artificial intelligence, and high-throughput computational screening, provide researchers with powerful tools and methods to guide the discovery, design, optimization, performance, and evaluation of non-traditional thermoelectric and thermionic materials and devices.

The focus of this symposium is to convene leading global field experts to engage in ceramic technology-centered dialogues to address critical issues in the development of thermoelectric and thermionic energy conversion materials and devices. Researchers and scientists in thermoelectrics/thermionics and related fields are cordially invited to participate in this symposium.

Proposed Session Topics

- Ceramic technology-centered materials development in thermoelectric and thermionic energy conversion for electrical power generation and cooling/thermal management
- Novel thermoelectric and thermionic materials with high power factor and/or high figure of merit
- Organic thermoelectric materials and organic-inorganic hybrid systems
- Flexible thermoelectric materials and devices
- Porous thermoelectric/thermionic materials
- Electronic and phononic band structure engineering, nanostructure engineering, superlattice structures and 2D thermoelectric/thermionic materials
- Thermal stability and mechanical properties of thermoelectric/thermionic materials and reliability of devices
- Electrical and thermal contact resistivity and their interplay with the joining of thermoelectric/thermionic materials
- Structure/property relationships, thermodynamics, and solid-state defect chemistry of thermoelectric/thermionic materials
- Theoretical and experimental approaches to thermal and electrical transport mechanisms in thermoelectric/thermionic materials
- Design of new thermoelectric and thermionic materials using density functional theory or other first principles computational methods
- Machine learning, artificial intelligence, and high-throughput computational screening for the discovery and optimization of thermoelectric and thermionic materials
- Innovative processing routes for thermoelectric and thermionic materials
- Advanced manufacturing technologies for thermoelectric/thermionic devices and modules
- Miniaturized and integrated thermoelectric and thermionic devices
- System-level applications of advanced thermoelectric devices and modules in electrical power generation (i.e. thermogenerators), sensor technology, and heating/cooling

Symposium Organizers

- Michitaka Ohtaki, Kyushu University, Japan
- Hyun-Sik Kim, University of Seoul, Republic of Korea
- Armin Feldhoff, Leibniz University Hannover, Germany
- Sunmi Shin, National University of Singapore, Singapore
- Kyu Hyoung Lee, Yonsei University, Republic of Korea
- Umut Aydemir, Koç University, Turkey
- Mona Zebarjadi, University of Virginia, USA
- Mari-Ann Einarsrud, Norwegian University of Science and Technology, Norway
- Jon C. Goldsby, NASA Glenn Research Center, USA
- Peng Jiang, Dalian Institute of Chemical Physics, China
- Theodora Kyratsi, University of Cyprus, Cyprus
- Takao Mori, National Institute for Materials Science, Japan
- Amin Nozariasbmarz, The Pennsylvania State University, USA
- Daryoosh Vashaee, North Carolina State University, USA
- George Nolas, University of South Florida, USA
- Winnie Wong-Ng, National Institute of Standards and Technology (NIST), USA
- Takayoshi Katase, Tokyo Institute of Technology, Japan

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- Kyu Hyoung Lee: khlee2018@yonsei.ac.kr

SYMPOSIUM 5

Next Generation Bioceramics and Biocomposites

The last few decades have witnessed significant progress in the use of ceramics and composites for biomedical applications, with anticipated benefits in clinical diagnosis and treatment. In addition to conventional ceramic fabrication technologies, biomimetic processes are also being adopted to develop bio-inspired materials and inorganic-organic hybrids. The advent of nanotechnology and additive manufacturing has further expanded the spectrum of applications of bioceramics and biocomposites. This symposium will provide a platform to stimulate discussion among active researchers from academia/national labs, medical device manufacturers, entrepreneurs and clinicians, who are involved in the development and application of bioceramics.

Proposed Session Topics

- Bioactive, resorbable and porous bioceramics and composites (joint with Symposium 9)
- Bioceramics for implantable devices, biosensor and cosmetic application
- Surface modifications and coatings for implants and medical devices
- Nanostructured and self-assembled bioceramics (joint with Symposium 7)
- Ceramics and composites with antimicrobial, antiviral and drug delivery properties
- Additive manufacturing and hybrid bioceramic-polymer systems
- Smart, bio-responsive, bio-inspired and biomimetic ceramics
- In vitro and in vivo biocompatibility, biomineralization and tissue-material interactions
- Light-emitting, magnetic, conductive and sensing bioceramics
- Sustainable and eco-friendly bioceramics

Symposium Organizers

- Katalin Balazsi, Center for Energy Research, Hungary
- Hui-Suk Yun, Korea Institute of Materials Science, Republic of Korea
- Cristina Balagna, Politecnico di Torino, Italy
- Lee Sungho, National Institute of Advanced Industrial Science and Technology (AIST), Japan
- Eva Hemmer, University of Ottawa, Canada
- Akiyoshi Osaka, Okayama University, Japan
- Antonia Ressler, Tampere University, Finland
- Ashutosh Kumar Dubey, Indian Institute of Technology, Varanasi, India

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- Cristina Balagna: cristina.balagna@polito.it

Advanced Materials and Technologies for Rechargeable Energy Storage

The significant increases in demand of world energy consumption as well as clean and efficient energy resources have prompted the imperative searches of new materials and technologies. The intermittent nature of the renewable power generation technologies will require new solutions for efficient and reliable energy storage. This symposium will focus on the advanced engineering ceramics and technologies that could help the global community to achieve the stated goals. It will explore state-of-the-art materials and technologies for energy storage, improvements in materials design, electrodes architecture, electrolytes, separators and cell chemistries. These are key factors to extend the life, enhance the safety, and lower the cost of rechargeable batteries, which are regarded as the most efficient energy storage systems for portable electronics, renewable energy storage, smart grid, and transportation applications. A deeper understanding of the battery materials/property relationship, electrode/ electrolyte interface phenomena, and cell failure mechanisms is critically needed to face these challenges. The search for advanced high capacity electrode materials, solid electrolytes and the implementation of the very challenging all-solid-state batteries, lithium batteries, lithium-sulfur, metal-air batteries, beyond lithium technologies including sodium batteries, Mg/Ca/Al-based batteries will be necessary to overcome the energy density shortfall and safety issues in currently commercial batteries.

This symposium will focus on crystal chemistry, structural analysis, materials processing, powder metallurgy, sintering, transport properties, structural and mechanical characterization, new testing methods, cost/performance and reliability issues, commercialization, market prospects and recyclability related to batteries and supercapacitors.

Proposed Session Topics

- Solid electrolytes for batteries
- All-solid-state batteries
- Advanced anode and cathode materials for lithium batteries
- Materials design, screening, and electrode architectures for lithium batteries
- Diagnostics and materials characterization for lithium batteries
- Electrode/electrolyte interface characterization for lithium batteries
- Applications focused lithium batteries
- Lithium-sulphur battery technology
- Sodium batteries, potassium batteries, magnesium batteries and calcium batteries
- Materials of capacitive energy storage (super-capacitors)
- Recycling of battery materials
- Stationary rechargeable batteries for grid, solar, and wind technologies

Symposium Organizers

- Palani Balaya, National University of Singapore, Singapore
- Naoaki Yabuuchi, Yokohama National University, Japan
- Olivier Guillon, Forschungszentrum Jülich, Germany
- Valerie Pralong, CNRS CRISMAT, France
- Mali Balasubramanian, Oak Ridge National Laboratory, USA
- Prabeer Barpanda, Indian Institute of Science, India
- Donald Dornbush, NASA Glenn Research Center, USA
- Byounwoo Kang, Pohang University of Science and Technology, Republic of Korea
- Shih-Kang Lin, National Cheng Kung University, Taiwan
- Wan Si Tang, Underwriters Laboratories Research Institute, USA

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20th International Symposium on Functional Nanomaterials and Thin Films for Sustainable Energy, Environmental and Biomedical Applications

Functional nanomaterials with intrinsically new and tailored properties are key elements for developing sustainable solutions for energy, environment and health. Specifically, this symposium will focus on new materials, energy technologies and devices based on inorganic, hybrid and composite materials. Particular emphasis will be given to novel synthesis approaches, surface functionalization, and heterostructuring of nanoparticles, nanowires, 2D materials and nanoscopic films, fundamentally new properties, and energy-efficient materials synthesis. Functional surfaces fabricated using emerging processing techniques such as jet printing, 3D printing, etc. are also within the scope of the symposium. Applications of nanostructures in photocatalysis, energy, sensing, and biomedical applications that combine advanced processing with conceptual advancements will form the major thrust areas. Contributions related to energy applications such as photovoltaics (perovskite materials), photothermal materials, batteries, fuel cells, thermoelectric materials, water splitting, and carbon conversion as well as transparent conductors and challenges related to the large-scale production and integration of functional and structural nanomaterials are highly desired.

Proposed Session Topics

- Synthesis, functionalization and assembly of inorganic and hybrid nanostructures
- Nanomaterials for energy conversion, storage and catalysis
- Nanomaterials for sensing, batteries and water-splitting applications
- Nanomaterials for thermoelectrics, photocatalysis, electrocatalysis, and solar hydrogen
- Nanotoxicity, bio-imaging, drug-delivery and tissue engineering with tailored nano-bioconjugates
- Transition metal chalcogenides, carbonaceous nanostructures, 2D materials
- Functional coatings and innovative thin film techniques
- Interfacial materials and multi-material heterostructures & nanocomposites
- Computational methods in the design of tailored nanostructured materials
- Industrial production and application of nanomaterials & coatings

Symposium Organizers

- Muhammet S. Toprak, KTH Royal Institute of Technology, Sweden
- Sanjay Mathur, University of Cologne, Germany
- Andreu Cabot, Catalonia Institute for Energy Research, Spain
- Sedat Ballikaya, Istanbul University, Turkey
- Ender Suvaci, Eskisehir University, Turkey
- Elisa Moretti, University of Venice, Italy
- Theodora Kyratsi, University of Cyprus, Cyprus
- Ji-Hyun Jang, Ulsan National Institute of Science and Technology, Republic of Korea
- Ayan Roy Chaudhuri, Indian Institute of Technology, Kharagpur, India
- Do Kyung Kim, Konyang University, Republic of Korea
- Bin Zhu, Southeast University, China
- Ruth Adam, University of Cologne, Germany
- Ziyaad Aytuna, University of Cologne, Germany

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SYMPOSIUM 8

20th International Symposium on Advanced Processing and Manufacturing Technologies for Structural and Multifunctional Materials and Systems (APMT20)

Structural and multifunctional materials development is important for the frontier engineering sector, including energy, environment, healthcare, defense, nuclear, aerospace, and more. However, the performance of these advanced materials is largely dependent on the processing and manufacturing techniques employed. A thorough understanding of forming and sintering behavior is essential to achieve tailored microstructures, enhance material properties and fabricate complex geometries. The objective of this symposium is to discuss recent progress in technology development for processing and fabricating advanced structural and multifunctional materials systems. The symposium will cover innovations in technology development, as well as the state-of-the-art understanding of processing-microstructure-property-performance relationships. Topics will encompass a large spectrum of advanced materials, including non-oxide and oxide-based structural ceramics, fiber-reinforced and particulate composites, functionally gradient materials, and multifunctional materials, along with their components and devices. Eco-friendly and cost-effective processing approaches, along with the joining and degradation behavior, will also be covered.

Proposed Session Topics

- Novel forming/sintering technologies, near-net shaping
- Rapid prototyping, 3D printing, patterning, templates, and self-assembly
- Advanced ceramics manufacturing technologies, hybrid processes
- Microwave processing, flash sintering, high pressure assisted sintering, and SPS
- Polymer-based processing
- Design-oriented manufacturing and processing
- Joining, integration, machining, degradation, and refurbishment technologies
- Green manufacturing, global environmental issues, and standards

Symposium Organizers

- Do Thi Mai Dung, Nagaoka University of Technology, Japan
- B V Manoj Kumar, Indian Institute of Technology, Roorkee, India
- Tatsuki Ohji, YNU/NITech/AIST, Japan
- Hisayuki Suematsu, Nagaoka University of Technology, Japan
- Young-Wook Kim, WORLDEX Industry & Trading Co., Ltd., Republic of Korea
- Weimin Wang, Wuhan University of Technology, China
- Enrico Bernardo, University of Padova, Italy
- Surojit Gupta, University of North Dakota, USA
- Yiquan Wu, Alfred University, USA
- Manuel Belmonte, Institute of Ceramics and Glass (ICV-CSIC), Spain
- Csaba Balazsi, HUN-REN Centre for Energy Research, Hungary
- Wei Ji, Wuhan University of Technology, China
- Hyun Sik Kim, University of Seoul, Republic of Korea
- Tohru Suzuki, National Institute for Materials Science, Japan

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SYMPOSIUM 9

Porous Ceramics: Novel Developments and Applications

Porous materials are essential components in many applications including, but not limited to, thermal insulation, catalysts, catalyst supports, filters, adsorbers, sensors, and lightweight components. This symposium aims to bring together the scientific community to share recent advances in the formation, characterization, properties, and modeling of porous ceramic, carbon, glass, and glass-ceramic components for diverse applications. These materials contain pore sizes from nanometers to millimeters, can have textured to random or hierarchical porosity, and are based on various pore architectures such as foams, honeycombs, fiber networks, and bio-inspired structures. They can be produced using a variety of fabrication approaches, from direct foaming to replication of a porous scaffold, from the use of sacrificial fillers to additive manufacturing. Because of these properties, porous materials are widely used in environmental, energy, biomedical, and other advanced applications. This symposium will be the ideal showcase for the research activities of the many groups involved in the development and use of porous materials, including but not limited to ceramics, chemistry, mechanics, fluid dynamics, modeling and simulation, and applications engineering.

Proposed Session Topics

- Innovations in processing methods and synthesis of porous ceramics
- Structure and properties (mechanical, thermal, etc.) of porous ceramics
- Novel characterization tools and software for porous structures
- Computational techniques, machine learning (ML) and artificial intelligence (AI) for porous ceramics
- Hierarchical, micro-porous, and meso-porous ceramics and gas separation ceramic membranes
- Engineered porous architectures enabled by additive manufacturing technologies
- Porous ceramics for environmental, energy, biomedical and functional applications

Symposium Organizers

- Tobias Fey, Friedrich-Alexander University of Erlangen-Nürnberg, Germany
- Manabu Fukushima, National Institute of Advanced Industrial Science and Technology (AIST), Japan
- Paolo Colombo, University of Padova, Italy
- Samuel Bernard, Institute of Research for Ceramics-CNRS, France
- Jian-feng Yang, Xi'an Jiaotong University, China
- NV Ravikumar, Indian Institute of Technology, Madras, India
- Eliandra de Sousa Triches, Federal University of São Paulo, Brazil
- Gisele Lecomte-Nana, University of Limoges, France

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SYMPOSIUM 10

Integrated Computational-Experimental Modeling and Design of Ceramics and Composites

Recent advances in computational materials science coupled with artificial intelligence and machine learning approaches have significantly enhanced our understanding of fundamental phenomena in material behavior. These advances have contributed to improvement in materials performance, as well as discovery and the design of new materials and structures. This symposium solicits research on state-of-the-art physical and chemical modeling and machine learning architectures for a range of analysis, characterization, design and modeling of ceramics and composites with tailored properties. Approaches in both computational research and experimental measurements across the length and time scales are encouraged. Examples include, but are not limited to, ML-assisted novel microstructure/composite material design, establishing structure-property relationships in complex material microstructures, multiscale modeling through ML-driven coupling between scales, AI-augmented experimental design, characterization and computational surrogate models for (multiphysics) behavioral predictions, and data-driven electromagnetic, thermal, chemical, frictional and mechanical response models. Of particular interest is also their micro-structure characterization, and the development of physically-informed materials design strategies, through e.g. image-based modeling. A broader perspective is desired including the interest related to ceramic genome, virtual materials design, materials processing and performance, simulation of novel ceramics and composites for (multi) functional applications, and the modeling of surfaces, interfaces and grain boundaries at multiple scales.

Proposed Session Topics

- Modeling of structure and property of ceramics and composites
- High-throughput design and characterization
- Material Informatics and machine learning
- Multi-scale modeling of processing, microstructure, and performance
- Modeling defects and amorphous matter and their evolution
- Modeling of surfaces, interfaces, and grain boundaries at multiple scales
- Multifunctional ceramics and composites- multiphysics modeling, characterization and design
- Fracture and damage mechanics
- Friction, wear, and tribology
- Multiphysics materials response to ablation
- Sensing/actuating materials modeling

Symposium Organizers

- Gerard L. Vignoles, University of Bordeaux, France
- Sathiskumar Anusuya Ponnusami, University of London, UK
- Jingyang Wang, Institute of Metal Research, Chinese Academy of Sciences, China
- Ghatu Subhash, University of Florida, USA
- Joaquin Garcia Suarez, École Polytechnique Fédérale de Lausanne, Switzerland
- Vignesh Kannan, École Polytechnique, Palaiseau, France
- Peter Kroll, The University of Texas, USA
- Jian Luo, University of California, San Diego, USA
- Yixiu Luo, Institute of Metal Research, Chinese Academy of Sciences, China
- Sergei Manzhos, Tokyo Institute of Technology, Japan
- Bin Liu, Shanghai University, China
- Katsuyuki Matsunaga, Nagoya University, Japan
- Paul Rulis, University of Missouri, Kansas City, USA

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SYMPOSIUM 11

Advanced Materials and Innovative Processing Ideas for Production Root Technologies

"Production root technologies" refers to a collection of six production technologies, including casting, molding, forming, welding, heat treatment, and surface treatment. Production root technologies involve both materials and process technologies that are hidden behind products and do not frequently appear outward. However, they are fundamentally very important and greatly influence material or module performance. As the functions of products become more complex and robust, the importance of these production root technologies is concurrently growing.
Production root technologies have an inherently interdisciplinary nature, inevitably encompassing a broad spectrum of skills, ranging from fundamental materials to component manufacturing and module integration. As demand increases for sustainable energy and semiconductor process especially by employing relevant materials, composites and/or functional techniques, the interdisciplinary approach plays an even greater role. Therefore, this symposium is designed to provide an opportunity for the world's leading scientists and engineers from many fields to exchange ideas and to build new collaborations in the fields of production root technologies.

Proposed Session Topics

- Fundamental materials: mining, particles, bulk, and functional materials and precursors
- Innovative manufacturing processes for recycling, sustainable energy, or the semiconductor industry
- Future-oriented techniques for coating, forming, and shaping materials
- Emerging intelligent technologies based on AI or IoT for enhancing product performance

Symposium Organizers

- Chisung Ahn, Korea Institute of Industrial Technology, Republic of Korea
- Sungwook Mhin, Dongguk University, Republic of Korea
- Ayahisa Okawa, Tohoku University, Japan
- Son Thanh Nguyen, National Institute of Technology, Japan
- Kyoung Il Moon, Korea Institute of Industrial Technology, Republic of Korea
- Hyuksu Han, Sungkyunkwan University, Republic of Korea
- Yuya Takimoto, Nagaoka University of Technology, Japan

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SYMPOSIUM 12

Atomically Layered Carbides, Nitrides, Borides, and Related Materials: From Bulk to Low Dimensional Derivates

The MAX and MAB phases are thermodynamically stable nanolaminates of early transition metals carbides, nitrides, and borides. The MAX/MAB phases are hexagonal materials with an inherent nanolayered crystal structure that is responsible for an unusual and unique combination of metal-like and ceramic-like properties, such as machinability, good electrical/thermal conductivity, high thermal shock resistance, good oxidation/corrosion resistance, stiffness at high temperatures, etc. The unique properties of the MAX/MAB phases make them appealing candidate materials for diverse potential industrial applications. Recently, it was shown that it is possible to selectively etch atomic metal layers out of the crystal structure and to separate each nanolaminated block of these transition metal compounds to form 2D solids (MXenes, MBenes). Despite their relatively short history, MXenes (the 2D phases resulting from the removal of A layers from the corresponding MAX phases) have attracted attention due to their attractive properties, such as excellent electronic conductivity, surface functionality, and tunability. Symposium 12 focuses on the design, processing, structure-property relationships, thermal, electrical, optoelectronic, solid lubrication and mechanical properties, stability, oxidation/corrosion resistance, radiation tolerance, as well as envisaged potential applications of these unique nanolaminated compounds in their 2D and 3D forms. In addition, exploratory research on further expanding the chemistry of ternary compounds is also invited, like in high entropy systems and new generation ternary borides.

Proposed Session Topics

- Design of novel compositions and manufacturing methods
- Methods for improving damage tolerance, oxidation/corrosion and thermal shock resistance
- Novel applications and device fabrication (electrochemical energy storage, biosensors, etc.) of MAX/MAB phases and MXenes/MBenes
- Study of electronic, optical, plasmonic and thermoelectric properties
- Theoretical calculations for designing and predicting the behavior of MAX/MAB phases and MXenes/MBenes
- Nuclear applications of the MAX/MAB phases

Symposium Organizers:

- Surojit Gupta, University of North Dakota, USA
- Miladin Radovic, Texas A&M University, USA
- Konstantina Lambrinou, University of Huddersfield, UK
- Jochen M. Schneider, RWTH Aachen University, Germany
- Thierry Cabioch, Université de Poitiers, France
- Sylvain Dubois, Université de Poitiers, France
- Per Eklund, Uppsala University, Sweden
- Johanna Rosen, Linköping University, Sweden
- Jesus Gonzalez, Laboratoire des Composites ThermoStructuraux UMR, France
- Chenxu Wang, Peking University, China

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- Konstantina Lambrinou: K.Lambrinou@hud.ac.uk
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SYMPOSIUM 13

Advanced Ceramics and Composites for Nuclear Fission and Fusion Energy Systems

The future safety and sustainability of nuclear energy systems based on fission and fusion technologies are strongly correlated to the development and application of advanced materials capable of withstanding the increasingly harsh environments of a nuclear reactor core. This international symposium will bring together scientists and engineers to discuss opportunities and needs in key enabling materials for application in nuclear energy systems. This will include the most up-to-date science and state-of-the-art technologies, ranging from materials design and development to processing and performance under relevant nuclear environments. The symposium will also include discussions on prospects and perspectives related to commercial development, qualification, and licensing requirements.

Proposed Session Topics

- Material technologies for core structures of light water reactors and advanced reactors
- Ceramic fuel materials, technologies, and characterization
- Graphite and carbon materials for nuclear applications
- High-temperature ceramics for space reactors
- New materials and containment for neutron moderators, reflectors, and shielding
- Processing and characterization of novel ceramics and composites for nuclear systems
- Structural and function materials for nuclear fusion: ceramic breeders, corrosion barriers, and advanced plasma-facing materials
- Joining and coating technologies for reactor components
- Chemical compatibility and corrosion
- Radiation damage, defect production, evolutions, and interactions
- Advanced characterization techniques and methods
- Fuel, cladding, assembly, and core evolutions and performance modeling
- Test methods, codes and standards, design methodology, and material qualification

Symposium Organizers

- Takaaki Koyanagi, Oak Ridge National Laboratory, USA
- Dong (Lilly) Liu, University of Oxford, UK
- Monica Ferraris, Politecnico di Torino, Italy
- Tatsuya Hinoki, Kyoto University, Japan
- Samuel Humphry-Baker, Imperial College London, UK
- Gyanender Singh, Idaho National Laboratory, USA
- David Sprouster, Stony Brook University, USA

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SYMPOSIUM 14

Crystalline Materials for Electrical, Optical and Medical Applications

This session will provide a forum for the presentation and discussion of recent research and development activities on crystalline materials. The session will cover all aspects, from basic research and material characterization to the physicochemical aspects of growth, synthesis, and deposition techniques, as well as the technological development of industrialized materials. For this purpose, world-wide experts in the different topics will be invited to introduce their most recent activities. The broad scope of the session assures an exhaustive overview of the state-of-the-art issues on crystalline materials, aiming to stimulate interdisciplinary discussions and collaborations in a wide range of fields.

Proposed Session Topics

- Semiconductors for LED/LD, power device, sensor
- Optical materials for laser, nonlinear optics, optical isolator, phosphor
- Scintillators for X-, gamma- and neutron detection
- Piezo-, ferro- and magneto-electric materials
- Transparent ceramics and nanocrystals
- Phase diagrams, defect chemistry, and crystalline quality

Symposium Organizers

- Kiyoshi Shimamura, National Institute for Materials Science, Japan
- Nerine J. Cherepy, Lawrence Livermore National Laboratory, USA
- Kenji Toda, Niigata University, Japan
- Takayuki Yanagida, Nara Institute of Science and Technology, Japan
- Mariya Zhuravleva, University of Tennessee, USA
- Hiroaki Furuse, National Institute for Materials Science, Japan
- Philippe Veber, West University of Timişoara, Romania
- Hiroki Tanaka, Leibniz-Institut für Kristallzüchtung, Germany
- Rong-Jun Xie, Xiamen University, China
- Tetsuo Tsuchiya, National Institute of Advanced Industrial Science and Technology (AIST), Japan
- Javier E. Garay, University of California, San Diego, USA
- Romain Gaume, University of Central Florida, USA
- Kevin Anderson, U.S. Naval Research Laboratory, USA

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SYMPOSIUM 15: 10th International Symposium on Additive Manufacturing and 3D Printing Technologies

Additive manufacturing (AM) and 3D printing technologies are globally recognized as novel fabrication processes for advanced materials and components with multifunctional structures. These technologies offer tremendous potential for design innovations and customization, complex part fabrication with multifunctionality, rapid prototyping, and distributed digital manufacturing. In this approach, three-dimensional models are designed and created according to theoretical concepts using computer software, and two-dimensional cross sections are created by slicing operations automatically. In direct writing processes, paste materials with ceramic/metal particles dispersed in binder system are fused from nozzles moving freely in three dimensions to create composite structures. In laser-based approaches, high resolution laser beams are scanned on a spread ceramic powder bed with or without resin binders to form solid planes of two-dimensional cross sections. Various functional components of dielectric lattices to control electromagnetic waves, bio-materials components for medical applications, and ceramics electrode with large surface area could also be developed. Large scale structural components for aerospace and other high temperature applications can be fabricated with internal cooling path networks formed without casting molds. Utilizing smart additive manufacturing, it is possible to design for function and not for manufacturing. However, each technique needs special design adjustments to boost products' efficiency and multi-functionality. This symposium focuses on superiority of design, efficient processing, and perspicuous evaluations in the additive manufacturing and 3D printing processes. In addition, various topics related to starting materials, characterization tools, NDE and in-situ monitoring of processes, qualification and certification, cost, and applications will also be discussed.

Proposed Session Topics

- Design with/for additive manufacturing
- Materials and process characterization tools
- Laminated object manufacturing/green tape stacking
- Powder bed fusion/selective laser melting and sintering
- Material extrusion/fused deposition modeling
- Binder jetting processes
- Vat photopolymerization/stereolithography
- Direct writing/ink jet printing technologies
- Multi-material and hybrid printing techniques
- AM of particulate and fiber reinforced composites
- Qualification, certification, standards, and property database
- Applications of AM materials and components

Symposium Organizers

- Soshu Kirihara, Osaka University, Japan
- Michael Halbig, NASA Glenn Research Center, USA
- Mrityunjay Singh, Ohio Aerospace Institute, NASA Glenn Research Center, USA
- Martin Schwentenwein, Lithoz GmbH, Austria
- Hui-Suk Yun, KIMS, Republic of Korea
- Majid Minary, The University of Texas, USA
- Alberto Ortona, SUPSI, Switzerland
- Corson L. Cramer, Oak Ridge National Laboratory, USA
- Giorgia Franchin, Università di Padova, Italy
- Yan Li, Dartmouth College, USA
- Russell Maier, National Institute of Standards and Technology (NIST), USA
- Fiona Sprirret, Osaka University, Japan
- Michael Stuer, EMPA, Switzerland
- Lynnora Grant, The University of North Carolina at Charlotte, USA

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SYMPOSIUM 16

Geopolymers, inorganic polymer-derived ceramics and sustainable construction materials

Refractory inorganic polymers can be made at ambient temperatures and pressures from a powder and a liquid to form a paste of low viscosity. These materials, called "geopolymers", include alkali metakaolin-based, alumino-silicates; alumino silicate phosphates; magnesium borates; potassium magnesium phosphates; alternative geopolymer compositions. The use of biological materials as starting compounds or as reinforcements in composites demonstrates the eco-friendly and sustainable nature of these materials. The alkali-based, aluminosilicate geopolymer "glue" is refractory up to 1000°C, whereupon it converts to a ceramic, or a ceramic plus glass. Novel potential applications of such composites include: organic alkali charge-balanced geopolymers; porous geopolymers for water purification by heavy metal removal; geopolymer derived nano-zeolites for CO_2 sequestration; porous geopolymers for thermal insulation; structural ceramic composites containing ceramic, metal, organic or biological reinforcements; fire and corrosion resistant coatings; nuclear radiation shielding geopolymer composites; infrastructure and construction materials. The nanoparticulate nature of geopolymers also provides a low energy, processing route to ultra-refractory ceramic powders or versatile forming methods based on transient, organic alkali, charge-balanced geopolymer, and 4D printing, taking advantage of geopolymer thixotropy.

Proposed Session Topics

- Synthesis, processing microstructure
- Mechanical properties, thermal shock resistance
- Alkali-based geopolymers
- Acid-based phosphate geopolymers
- Other inorganic geopolymer analogues
- Geopolymer-derived processing routes
- Nuclear radiation shielding
- Sustainable construction materials
- Use of waste materials to make geopolymers
- Novel applications

Symposium Organizers

- Waltraud M. Kriven, University of Illinois at Urbana-Champaign, USA
- Joseph Davidovits, Geopolymer Institute, St. Quentin, France
- Henry A. Colorado, Universidad de Antioquia, Colombia
- Cristina Leonelli, University of Modena and Reggio Emilia, Italy
- Sylvie Rossignol, University of Limoges, France
- Ana Trindade, University of São Paulo (USP), Brazil

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SYMPOSIUM 17

Advanced Ceramic Materials and Processing for Photonics and Energy

In the past few years significant progress has been reported on the synthesis and structural, physical and chemical characterization of ceramic nano-structures that exhibit size-dependent properties and on novel glass-based materials for optical lasers and amplifiers. Nanomaterials have been widely studied and are leading to fundamental new discoveries as well as applications in Photovoltaics, Optical sources, Electroceramics, Multi-ferroic materials, Catalysis, Water Treatments and Solar Hydrogen.

This symposium focuses on all ceramic materials with application potential as functional materials, with particular consideration given to the capability to tailor and control material properties via surface and structural modifications. The session also includes novel optical glass-based and glass-ceramic materials with new functionalities, new emission wavelengths and with an overview toward integration with other classes of materials (polymers, metals). New nanotechnology tools and technological procedures for the development of new functional devices integrating bottom-up and top-down technologies will be also considered.

Proposed Session Topics

- Multi-functional materials
- Advanced and nanostructured materials for photonics, electronics and sensing
- Advanced and nanostructured materials for photo-voltaics and solar fuels
- Advanced glass-based and glass-ceramic materials for laser sources and non-linear applications

Symposium Organizers

- Alberto Vomiero, Luleå University of Technology, Sweden
- Elisa Moretti, University of Venice, Italy
- Federico Rosei, University of Trieste, Italy
- Yasuhiro Tachibana, RMIT University, Australia
- Isabella Concina, Luleå University of Technology, Sweden
- Haiguang Zhao, Qingdao University, China
- Francesco Enrichi, University of Verona, Italy
- Kassa Belay Ibrahim, Ca' Foscari University of Venice, Italy
- Adam Duong, University of Picardy, France

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SYMPOSIUM 18

Ultrahigh Temperature Ceramics

Ultrahigh temperature ceramics (UHTCs) are materials of interest for use in extreme environments that are beyond the capabilities of other materials. Some proposed applications for UHTCs include scramjet engine components, leading edges and thermal protection systems for hypersonic vehicles, plasma facing materials in nuclear fusion reactors, solar power concentrators, fuel forms in nuclear fission reactors, and others. Challenges exist for UHTCs and limit near-term use include: thermal/chemical stability in extreme environments; the ability to be formed into complex shapes; thermal shock resistance; irradiation resistance; and damage tolerance. For such extreme environment applications, advances in the understanding of structure-property relations and performance are needed. This symposium will focus on the discovery, design, processing, and processing-microstructure-property relationships, as well as the thermal and mechanical properties, oxidation resistance, machining, joining, and thermal/chemical stability of UHTCs and UHTC composites, from both fundamental and application-oriented perspectives.

Proposed Session Topics

- Novel processing methods for bulk, coatings, thin films, fibers, and/or composites
- Precursors for powders, coatings, and matrix or fibers of composites
- Processing-microstructure-property relationships of existing or new systems
- Bulk ceramics, thin films, coatings, fibers, and composites
- Compositionally complex UHTCs
- Super-hard UHTCs
- Characterization methods and lifetime assessment
- Methods for improving damage tolerance, oxidation behavior, and thermal shock resistance
- Response in extreme environments (irradiation, ultra-high temperature, etc.)
- Simulation and theory for predicting stability or behavior under extreme environments

Symposium Organizers

- Bai Cui, University of Nebraska-Lincoln, USA
- William G. Fahrenholtz, Missouri University of Science and Technology, USA
- Sea-Hoon Lee, Korea Institute of Materials Science, Republic of Korea
- Frederic Monteverde, National Research Council-Institute of Science and Technology for Ceramics, Italy
- Guo-Jun Zhang, Donghua University, China
- Ji Zou, Wuhan University of Technology, China
- Lisa Rueschhoff, Air Force Research Laboratory, USA
- Lavina Backman, Naval Research Laboratory, USA
- Simon Middleburgh, Bangor University, UK
- Jon Binner, University of Birmingham, UK
- Theresa Davey, Bangor University, UK
- Scott McCormack, University of California, Davis, USA
- Chris Weinberger, Colorado State University, USA

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SYMPOSIUM 19

Molecular-level Processing and Chemical Engineering of Functional Materials

The synthesis of materials using molecular precursors is a highly effective method for obtaining compounds with controlled and adjustable compositions, crystal structures, morphologies, and property profiles. Therefore, designing suitable molecular precursors, along with a thorough understanding of their thermal conversion into desired functional materials, is crucial for enhancing rational preparative concepts aimed at creating custom (multi) functional structures. Utilizing molecular synthesis techniques for functional materials is particularly attractive due to their excellent atom economy, their ability to yield well-defined chemical and phase compositions, and their potential to produce unique morphologies and metastable phases. By leveraging these techniques, we can achieve unprecedented material designs that fulfill specific functional requirements.
This symposium brings together materials chemists, ceramists, and materials engineers who are developing new concepts and pathways for synthesizing, net-shaping, and integrating functional materials into devices. Although traditional top-down methods are preferred for their simplicity and somewhat predictable nature, they primarily operate within thermodynamic regimes and are less suitable for synthesizing multi-component and hybrid (organic-inorganic) materials. Despite the advantages of molecular-level processing of inorganic solids, a significant challenge arises from the limited understanding of molecule-to-material transformations, coupled with the fact that many molecular precursors are not commercially available. Contributions will critically assess the roles of precursor chemistry and additives in solutions, including techniques such as sol-gel, solvothermal, electrospinning, microwave processing, Chemical Vapor Deposition (CVD), and Atomic Layer Deposition (ALD). Specific emphasis is placed on material manufacturing strategies like 3D printing, chemically controlled assembly, and the purpose-driven modification of materials. A focus will highlight non-conventional synthesis and analytical methods that enable in-situ diagnostics and provide mechanistic insights into nucleation, growth, and self-assembly. The need for new and innovative chemical processing methods to achieve specific material compositions, which can integrate advancements in materials processing techniques with the existing knowledge base of materials chemistry, will also be emphasized in this symposium. The industrial potential of chemically processed materials will be analyzed and discussed in relation to their simplicity, scalability, and cost-effectiveness. Furthermore, aspects related to the potential use of molecular precursor synthesis concepts toward a circular economy, waste-free processes, and effective materials recycling will also be considered and critically discussed.

Proposed Session Topics

- Precursor chemistry – structural and thermal transformations
- Chemically processed nanostructures and on-surface nanochemistry
- Two-dimensional materials and their chemical functionalization
- Solution-processing of nanomaterials for optical, catalytic, and sensing applications
- Molecular precursor approaches for vapor-phase synthesis (ALD, CVD) of materials
- In-situ characterization of micro-structure evolution
- New processing methods, 3D printing, and knowledge-driven processing
- Scaled-up production of precursor-derived materials
- Materials integration and device applications

Symposium Organizers

- Peter Kroll, The University of Texas, USA
- Yoshiyuki Sugahara, Waseda University, Japan
- Samuel Bernard, University of Limoges, France
- Christina Birkel, Arizona State University, USA
- Emanuel Ionescu, Technische Universität Darmstadt, Germany
- Thomas Konegger, TU Wien, Austria
- Ravi Kumar NV, Indian Institute of Technology, Madras, India
- Sanjay Mathur, University of Cologne, Germany
- Christelle Salameh, University of Montpellier, France
- Gurpreet Singh, Kansas State University, USA

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GOLDEN JUBILEE SYMPOSIUM

The American Ceramic Society
ceramics.org

Engineered Ceramics for Achieving Net-Zero Carbon Emissions

Organized by the Engineering Ceramics Division (ECD) of the American Ceramic Society (ACerS), the International Conference & Exposition on Advanced Ceramics & Composites (ICACC) is the most prominent international meeting in advanced structural and functional ceramics, composites, and emerging ceramic materials and technologies. Since its first meeting at Cocoa Beach, Florida in 1977 with 37 papers (all invited) and ~90 attendees, ICACC has experienced tremendous growth in interest and participation from global ceramic communities, currently with 20 symposia, 7 focused sessions, more than 950 presentations/900 attendees, 32 exhibitors, and participation from 43 countries. ICACC will celebrate its 50th anniversary on January 25-30, 2026, at Daytona Beach, FL, USA.
As one of several events for the celebration of this anniversary during ICACC 2026, a special Golden Jubilee Symposium entitled "Engineered Ceramics for Achieving Net-Zero Carbon Emissions" is being organized. This symposium will feature previous ECD James I. Mueller, Mrityunjay Singh Bridge Building, Jubilee Global Excellence, and Global Young Investigator Award winners, past and current ECD officers, and past ICACC plenary speakers. All the invited speakers will deliver presentations on the current status and future prospects of various technical topics related to advanced ceramics and composites as well as 50-year journey of ceramics and composites at Cocoa Beach/Daytona Beach. We hope that this symposium will serve as a global stage for the information exchange on the latest technologies of engineered ceramics and facilitate open dialogue and discussion with leading experts for the next generation.

Proposed Symposium Topics

- Current trends and future directions for research and technology on advanced ceramics, composites, and multifunctional materials
- Challenges and prospects for various ceramic technologies
- Artificial Intelligence, Machine Learning (AI/ML), and data driven strategies for materials innovation and rapid technology implementation
- Innovative manufacturing processes for greening of ceramics manufacturing industrial processes
- Global energy and environmental challenges and roles of ceramics; Advanced materials (ceramics, composites, and multifunctional) and manufacturing technologies for Hydrogen generation, wind energy, geothermal, solar energy, batteries, and energy storage systems
- Advanced technologies to increase energy efficiency and reduce the carbon footprint of energy production and consumption
- New and innovative strategies and technologies for sustainable and self-sufficient solutions
- Multifunctional Ceramics for healthcare and biomedical applications
- Innovative materials for addressing water scarcity and waste management challenges
- Desalination membranes, bioinspired materials, water filtration materials for tackling PFAS and emerging contaminants, and advanced recycling technologies for accessing clean water, reducing waste, and recycling critical materials and minerals
- Ceramic education, training, and knowledge management

Symposium Organizers:

- Michael C. Halbig, NASA Glenn Research Center, USA
- Manabu Fukushima, National Institute of Advanced Industrial Science and Technology (AIST), Japan
- Palani Balaya, National University of Singapore, Singapore
- Mrityunjay Singh, Ohio Aerospace Institute, NASA Glenn Research Center, USA
- Tatsuki Ohji, YNU/NITech/AIST, Japan
- Monica Ferraris, Politecnico di Torino, Italy
- Alexander Michaelis, Fraunhofer IKTS, Germany
- Hui-Suk Yun, Korea Institute of Materials Science, Republic of Korea
- Dileep Singh, Argonne National Laboratory, USA
- Sanjay Mathur, University of Cologne, Germany
- Jingyang Wang, Institute of Metal Research, Chinese Academy of Sciences, China
- Young-Wook Kim, WORLDEX Industry & Trading Co., Ltd., Korea
- Csaba Balazsi, HUN-REN Centre for Energy Research, Hungary
- Stuart Hampshire, University of Limerick, Ireland
- Walter Krenkel, University of Bayreuth, Germany
- Lalit Mohan Manocha, UGC-IUAC, India

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Bioinspiration, Design, Green Processing, and Related Technologies of Advanced Materials

Over billions of years of evolution and natural selection, living organisms have developed the ability to produce complex and multifunctional materials efficiently and accurately under environmentally benign conditions. Taking inspiration from the structure-function relationships and the fabrication processes of these biological materials, numerous advanced materials with novel structures and functions have been designed and fabricated. In addition, novel bio-fabrication techniques, multi-scale modeling accelerated by AI, and green processing, along with related technologies, exhibit flexibility in materials design to impart various functions for diverse applications. The symposium aims to provide a forum for researchers, students, and entrepreneurs to present and discuss their recent scientific findings on a wide range of topics related to science and engineering issues associated with biological materials, bioinspired materials, smart materials, rational optimization, and green processing technologies for advanced materials. A particular emphasis will be placed on the fundamental issues related to advancing our understanding and utilization of the biological materials' synthesis and fabrication strategies, current progress and challenges, and future directions in green processing and related technologies.

Proposed Session Topics

- Structure and properties of biological materials and bioinspired materials
- Aqueous synthesis, colloidal processing, and bottom-up assembly
- Advances in multiscale modeling, physics-informed machine learning and artificial intelligence methods
- Advances in bioinspired materials and bioprocessing inspired fabrication techniques
- Advances in the cold sintering process of functional ceramic materials
- Green processing for energy conversion and storage materials and environmental materials
- Future directions of bioinspired materials, green processing and technologies

Symposium Organizers

- Zhaoyong Zou, Wuhan University of Technology, China
- Manoj K Mahapatra, University of Alabama at Birmingham, USA
- Zhao Qin, Syracuse University, USA
- Ling Li, University of Pennsylvania, USA
- Wei Zhai, National University of Singapore, Singapore
- Ziqi Sun, Queensland University of Technology, Australia
- Florian Bouville, Imperial College London, UK
- Hang Ping, Wuhan University of Technology, China

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FOCUSED SESSION 2

Ceramics to Shape the Future of Low-Carbon and Carbon-Negative Technologies

Reducing, and preferably eliminating, unsustainable greenhouse gas emissions is critical to preventing the damaging and costly effects of climate change. Technology plays a key role in the direct avoidance of carbon emissions, carbon capture storage and utilization, alternative fuels production, renewable energy generation and use, and energy efficiency. There is extensive global activity in decarbonization technology, and ceramic materials have a significant impact on many of these technologies. This symposium will provide a platform to discuss the latest advances, novel solutions, and remaining challenges in materials (including discovery, property engineering, processing, and manufacturing), components, and systems. The symposium's goal is not only to exchange recent results from experienced and young scientists, but also to engage in an extensive discussion of unsolved problems and development directions.

Proposed Session Topics

- Carbon direct avoidance technology
- Ceramics for green steel production
- Inert anodes for aluminum production
- Ceramics for oxyfuel combustion
- Carbon capture, utilization, and storage
- Solid CO_2 sorbents
- Membranes for CO_2 capture and utilization
- Ceramics and catalysts for the utilization of CO_2 or solid carbon as feedstocks
- Chemical looping for CO_2 valorization
- Alternative fuels production
- Catalysts and materials for hydrogen production (excluding high temperature electrolysis)
- Ceramics for ammonia synthesis, reforming, separation, storage, and handling
- Ceramics for biofuel and biochar production and use
- Catalysts and materials for Fischer-Tropsch reactions
- Hydrogen utilization
- Materials and coatings for hydrogen engines and pipelines
- Ceramics for hydrogen storage
- Hydrogen sensors
- Membranes for separation of hydrogen from natural gas, ammonia, etc.
- Electrification and energy efficiency
- Ceramics for industrial-scale electricity-to-heat conversion: heating, etc.
- Ceramics for electrical production of heat or steam
- High voltage power electronics
- Microreactors for process intensification
- Heat exchangers for industrial processes
- Materials, coatings, and components for supercritical CO_2 power cycles
- Ceramics for thermal energy storage
- Manufacturing, lifecycle assessment, and circular economy
- Decarbonizing ceramic production
- Advanced/green manufacturing
- Lifecycle analysis (LCA) and circular economy

Symposium Organizers

- Charles Lewinsohn, Rational Solutions, LLC, USA
- Marta Boaro, Università di Udine, Italy
- Federico Smeacetto, Politecnico di Torino, Italy
- Alexander Michaelis, Fraunhofer IKTS, Germany
- Takashi Makino, National Institute of Advanced Industrial Science and Technology (AIST), Japan
- Lyndsey McMillon-Brown, NASA Glenn Research Center, USA

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FOCUSED SESSION 3

Smart Powder Processing of Multifunctional Ceramics and Catalyst Materials

Powder processing plays a vital role in producing advanced ceramics and functional materials, including catalysts that enable clean energy and sustainability. In catalyst development, precise control over powder synthesis, dispersion, and structural formation enhances efficiency, durability, and reusability. Likewise, innovations in powder processing have a profound influence on material performance in high-technology applications. This session aims to highlight smart strategies and advanced technologies in powder design, particle surface engineering, microstructure optimization, and advanced characterization methods to drive progress in both ceramic and catalytic materials.

Proposed Session Topics

- Microstructural design of powders for ceramics and catalysts
- Particle surface modification, coating, and composite fabrication
- Dispersion and suspension control in liquids and polymers
- Advanced granulation techniques
- Cost-effective and energy-efficient powder processing technologies
- Sustainable material reuse, recycling, and catalyst regeneration
- Design and synthesis of heterogeneous catalysts for energy and environmental applications
- Interface engineering for photocatalytic, thermo-photocatalytic, and electrocatalytic reactions
- Advanced characterization and in-situ analysis for powders and catalytic materials
- Smart powder processing for next-generation catalysts

Session Organizers

- B.V. Manoj Kumar, Indian Institute of Technology, Roorkee, India
- Yuki Nakashima, National Institute of Advanced Industrial Science and Technology (AIST), Japan
- Taeseup Song, Hanyang University, Republic of Korea
- Junichi Tatami, Yokohama National University, Japan
- Hyuksu Han, Sungkyunkwan University, Republic of Korea
- Marta Boaro, University of Udine, Italy
- Sandan Kumar Sharma, Indian Institute of Technology, Patna, India
- Kunihiko Kato, Gifu University, Japan
- Yiquan Wu, Alfred University, USA

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FOCUSED SESSION 4

Ceramic/Carbon Reinforced Polymers

This focused session will cover ceramic/carbon-reinforced polymer composites utilized in a wide range of industrial applications including energy, environment, biological, space, transportation, building, and sport. This symposium aims to bring together the technical community to share recent advances in experimental or simulation approaches for the fabrication, processing, characterization, properties, and modeling of ceramic, ceramic/carbon-reinforced polymers. The role of inorganic phases in the composites, in which that can provide various functionalities such as mechanical, thermal, biological, insulation, electric, chemical resistant and wear properties, composed of fillers or fibers from the nanometers to millimeters, and in textured to random. This symposium will be the ideal showcase for the research activities of many groups involved in the development of ceramic/carbon reinforced polymers and composites, and their recycling technology, including but not limited to the areas of ceramics, plastics, their interface chemistry, mechanics, modeling and simulation and engineering application.

Proposed Session Topics

- Innovative processing of ceramics and ceramic/carbon-reinforced polymers
- Novel process and characterization technology of fiber, filler, matrix, and composites
- Mechanical behavior - fracture, fatigue, deformation, and machine processing of ceramic/carbon reinforced polymers and composites
- Big data, informatics, computing, simulation, modeling, and theoretical approaches in ceramic/carbon reinforced polymers and composites
- Environmental, infrastructure, energy, biological, space, transportation, building, and sport applications
- Innovation for integration of ceramics and composites
- The role of composites in multi-material systems
- Thermoplastics-based composites
- Composite Recycling technology

Symposium Organizers

- Satoshi Kobayashi, Tokyo Metropolitan University, Japan
- Takenobu Sakai, Saitama University, Japan
- Toshio Ogasawara, Tokyo University of Agriculture and Technology, Japan
- Shinji Ogihara, Tokyo University of Science, Japan
- Tomohiro Yokozeki, The University of Tokyo, Japan
- Masahito Ueda, Nihon University, Japan
- Sota Oshima, Tokyo University of Agriculture and Technology, Japan
- Mohammad Fikry, Tokyo University of Science, Japan
- Manabu Fukushima, National Institute of Advanced Industrial Science and Technology (AIST), Japan
- Carlos Rolando Rios Soberanis, Centro de Investigación Científica de Yucatan, Mexico
- Musthafa Akbar, University of Riau, Indonesia
- Lea A.C. Lecointre Isaka, The University of Tokyo, Japan

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High Voltage Materials for Advanced High Power Electrical Applications

High voltage (HV) electrified systems for aerospace and terrestrial applications are getting a lot of attention due to their importance in enabling the next generation of high-power technologies for aircraft and space exploration where lightweight, compactness and high-speed power transmission are critical. Electrified systems require the development of novel lightweight multifunctional materials to lower the specific weight of power cables' insulation and conductor architectures. An improvement from state of the art in conductor and electrical insulation is a step forward in that advancement of the technology. Carbon fibers and other carbon nanomaterials have been considered to lower the specific weight of the electrical conductor, by trying to achieve conductivities like or better than copper. While the polymers used in state-of-the-art electrical insulation materials are not enough to achieve the performance required for these applications, and the addition of ceramic fillers are being studied to improve their performance. Moreover, the developed materials systems need to function properly at high voltages while withstanding extreme missions' electrical, chemical, thermal, and mechanical loading profiles. This necessitates developing relevant high voltage testing methods and combines it with identification, quantification and modelling of durability, failure mechanisms, and aging and life models of high voltage materials and components. In addition, the developed test capabilities should be used to measure the developed materials electrical properties such as ampacity, electrical conductivity, and breakdown voltage and mechanical properties such as stiffness, strength and fatigue durability and thermal properties such as thermal conductivity and upper temperature capability. This symposium solicits abstracts related to the development and processing of lightweight electrical conductors, electrical insulation, and hybrid materials and components such as wires and cables as well as their testing in extreme environments, characterization, and performance. Although this solicitation is for Aerospace application, it is also beneficial to terrestrial application.

Proposed Session Topics

- Development of lightweight durable conductors with metals and/or nanomaterials or carbon inclusions
- Electrical insulation development, using ceramic fillers in polymer and other novel materials and methods
- Ceramic candidates to improve electrical insulation performance
- Lifecycle characterization of HV power transmission components
- Processing of HV electrical component materials to form reliable electrical insulation and conductors
- Development of techniques to test, characterize and design components in aerospace conditions at HV
- Identification, quantification and modelling of durability and failure mechanisms of high voltage materials
- Modelling the electrical performance of conductors and insulations in extreme environments
- Semiconductor powered electronic devices to converters to drive the electrified aircraft

Symposium Organizers

- Dong (Lilly) Liu, University of Oxford, UK
- Maricela Lizcano, NASA Glenn Research Center, USA
- Diana Santiago, NASA Glenn Research Center, USA
- Amjad Almansour, NASA Glenn Research Center, USA
- Michael F. Mulzer, DuPont, USA
- Gian Carlo Montanari, University of Bologna, Italy / Florida State University, USA
- Ian Cotton, University of Manchester / aerospace HV Ltd., UK
- Michael Cullinan, The University of Texas, USA
- Mehran Tehrani, University of California, San Diego, USA
- Vesselin Shanov, University of Cincinnati, USA
- Marina Gandini, Prysmian Group, Italy
- Chanyeop Park, University of Wisconsin, USA
- Zhiting Tian, Cornell University, USA

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Innovative Material Processing for Diverse Resource Circulation Loops

The circular economy, coupled with environmental sustainability, is increasingly expected by society. It is a desirable practice for growth and regional development, even in the face of environmental and supply chain constraints. Emerging innovations for high-tech products to achieve sustainability are reliant on access to increasing demands for critical materials, which are essential for both economic importance and supply chain risks. Most critical materials are irreplaceable in batteries, solar panels, wind turbines, and energy-efficient lighting; therefore, their circular use is becoming key to fighting climate change while satisfying society's needs.
In response to this urgent need, it is necessary to develop a multiple resource circulation loop from resource-saving strategies such as long life, maintenance, and sharing, to resource circulation strategies such as reuse, refurbish, and recycle. The circulation of resources requires energy for recovery and separation. Improved environmental sustainability can be achieved through the use of renewable energy sources, as determined by life cycle analysis (LCA) and assessment. Therefore, energy-saving and cost-effective circulation processes play a crucial role in achieving enhanced environmental sustainability and mitigating supply chain stress through the recovery and reuse of critical materials.
In this regard, increasing research efforts are dedicated to the further development of innovative disassembly strategies and high-precision physical and chemical separation technologies, enabling the selective and energy-efficient recovery of valuable materials and components from complex products.
Furthermore, the resource circulation loop that is closer to consumers, such as longevity and reuse, makes the greatest contribution to both energy and resource conservation. Therefore, the materials and components of next-generation products are required to have a long service life, be repairable, and be easily disassembled for regeneration.
With the perspective of maximising resource efficiency and creating economic value from sustainable and circular practices, another promising approach is the valorisation and stabilization of wastes to develop alternative raw materials for functional and structural applications.
This symposium solicits abstracts related to novel upstream (during manufacturing) and downstream (end-of-life) recycling processes, disassembly/separation technologies, systems, and assessments that promote efficient resource circulation loops for materials and components.

Proposed Session Topics

- Recovery of critical/valuable materials from exhausted complex products
- Circular economy perspectives for inorganic waste/wastewater valorization and stabilization
- Valorization and reuse of construction and demolition wastes
- Structural control for easy decomposition of resins for diverse resource circulation
- Novel products and materials oriented toward easy disassembly and circulation design
- Advanced powder processing for circular economy
- Advanced material processing for longevity and repairability
- Data utilization/modelling/simulation for material circulation strategies

Symposium Organizers

- Sonia Lucia Fiorilli, Politecnico di Torino, Italy
- Chiharu Tokoro, Waseda University, Japan
- Beihai Ma, Argonne National Laboratory, USA
- Henry Colorado, Universidad de Antioquia, Colombia
- Enrico Bernardo, Università di Padova, Italy
- Hidehiro Kamiya, Waseda University, Japan
- Motoyuki Iijima, Yokohama National University, Japan
- Anna Schneller, University of Augsburg, Germany
- Majda Pavlin, Slovenian National Building and Civil Engineering Institute, Slovenia
- Manabu Fukushima, National Institute of Advanced Industrial Science and Technology (AIST), Japan
- Ziqi Sun, Queensland University of Technology, Australia

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SPECIAL FOCUSED SESSION

Special Focused Session on Entrepreneurship and Commercialization

This session explores the essential skills and attributes that define successful materials engineers and scientists in today's dynamic landscape. Core competencies such as team building, creativity, communication, and business acumen are increasingly vital for driving innovation and achieving professional excellence. Among these, entrepreneurship and commercialization have emerged as key enablers of job creation, innovation, and career development, offering unparalleled opportunities for growth and impact. A variety of perspectives encompassing insights into the entrepreneurial process, a journey marked by freedom of thought, originality, and calculated risk-taking, are welcomed. Whether scaling up groundbreaking technologies, bridging the gap between research and industry, or fostering a spirit of innovation, the tools and strategies discussed in this session will empower participants to elevate their impact in the field.

Proposed session topics

- Designing a successful start-up, for example, building a diverse team, business strategy, and business idea generation
- Assembling a focused team for a successful venture or product development
- Reallocating different resources, for example human resource management
- Promoting problem-solving and creative and out-of-the-box thinking
- Creating saleable products from research results

Symposium organizer

- Valerie Wiesner, NASA Langley Research Center, USA
- Young-Wook Kim, WORLDEX Industry & Trading Co., Ltd., Republic of Korea
- Surojit Gupta, University of North Dakota, USA
- Jie Zhang, Institute of Metal Research, China

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15th Global Young Investigator Forum on Sustainability

The Global Young Investigators Forum (GYIF) aims to bring together students, postdoctoral researchers, young professionals, and early-career faculty from around the world to showcase their research and promote scientific discussions that identify and tackle emerging global challenges at the forefront of ceramic science and engineering research. The GYIF dedicated symposium and poster session are a platform to support networking among young professionals, fostering global cooperation to approach current and future challenges in ceramic science and technology. The Global Young Investigator Award laureate will deliver the opening keynote lecture of the symposium.

All GYIF participants will be invited to attend a private luncheon hosted by the President of the American Ceramic Society. The American Ceramic Society will also provide complimentary student registration for a select number of eligible student GYIF presenters.

This year's GYIF seeks to promote a theme of Sustainability, a global issue to be addressed by the next generation of leaders and international cooperation. Presentations and posters should discuss how the work may address sustainability needs through various approaches.

Proposed Session Topics

- Sustainable Materials Development: Exploring novel ceramics, composites, and powder-based materials with enhanced properties for structural and functional applications
- Thermo-Mechanical Behavior of Ceramics and Composites: Understanding mechanical properties, phase transformations, and thermal stability for diverse applications
- Life Cycle Assessment (LCA) and Environmental Impact: Evaluating the sustainability of ceramic and composite materials from raw material sourcing to end-of-life strategies
- Efficient Manufacturing Processes: Strategies for optimizing material usage, reducing energy consumption, and enhancing production efficiency in ceramic and composite processing
- Circular Economy and Recycling Approaches: Innovations in reuse, remanufacturing, and recycling of ceramic and composite materials to minimize waste
- Design and Performance of Functional Ceramics: Advances in piezoelectrics, batteries, energy storage, and energy harvesting materials for next-generation technologies
- Green Chemistry and Sustainable Synthesis Methods: Environmentally friendly fabrication techniques for ceramics and composites
- Case Studies and Industrial Applications: Showcasing successful research and practical implementations in ceramic and composite technology
- Career Development and Collaboration in Ceramics Research: Career development in Science, Technology, Engineering, Mathematics and Medicine (STEMM), including building collaborative networks, research projects, as well as supporting different perspectives and promoting sustainability in the field of ceramics

Symposium Organizers

- Yuki Nakashima, National Institute of Advanced Industrial Science and Technology (AIST), Japan
- Dong (Lilly) Liu, University of Oxford, UK
- Meelad Ranaiefar, NASA Glenn Research Center, USA
- Bai Cui, University of Nebraska-Lincoln, USA
- Stefano De la Pierre, Politecnico di Torino, Italy
- Mark Du, Argonne National Laboratory, USA
- Ho Jin Ma, Korea Institute of Materials Science, Republic of Korea
- Fiona Spirrett, Osaka University, Japan
- Nor Ezzaty Ahmad, Universiti Teknologi Malaysia, Malaysia
- Xiangyu Li, University of Tennessee, Knoxville, USA
- Anna Schneller, University of Augsburg, Germany
- Minh Chu Ngo, National Institute of Advanced Industrial Science and Technology (AIST), Japan

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GOLDEN Jubilee Celebration of the 50th International Conference and Expo on Advanced Ceramics and Composites (ICACC 2026)

50TH

Organized by:
The Engineering Ceramics Division
of The American Ceramic Society

The American Ceramic Society
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CALL FOR PAPERS

ceramics.org/icacc2026

Abstracts due September 2, 2025