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11th International Conference on Ceramic Materials and Components for Energy and Environmental Applications

Ceramic technologies for sustainable development

June 14-19, 2015

Hyatt Regency
Vancouver, BC
Canada

ceramics.org/11cmcee

11th International Conference on Ceramic Materials and Components for En

Ceramic technologies for sustainable development

Ceramic materials provide solutions to everyday challenges that impact quality of life everywhere—environmental protection, energy supply and generation, healthcare, and more. The 11th CMCEE identifies key challenges and opportunities for ceramic technologies to create sustainable development in these key areas.

Four-track technical program

The conference opens with the plenary session, **Technological Innovations and Sustainable Development**, followed by **32 symposia** across four tracks.

- Ceramics for Energy Conversion, Storage, and Distribution Systems
- Ceramics for Energy Conservation and Efficiency
- Ceramics for Environmental Systems
- Cross-cutting Materials Technologies

Opportunities for networking and discussion

CMCEE's networking events provide additional opportunities to engage in discussions on the global scale and make lasting business relationships.

CMCEE Schedule Preview

Sunday – June 14, 2015

Registration	4 – 7 p.m.
Welcome Reception	5 – 7 p.m.

Monday – June 15, 2015

Registration	7:30 a.m. – 5 p.m.
Plenary Session	8:30 a.m. – 12:10 p.m.
Lunch	Noon – 1:30 p.m.
Concurrent Sessions	1:30 – 6 p.m.
Student and Young Professional Networking Mixer	6 – 9 p.m.

Tuesday – June 16, 2015

Registration	8 a.m. – 7:30 p.m.
Concurrent Sessions	8:30 a.m. – 6 p.m.
Lunch on own	Noon – 1:30 p.m.
Poster Session	5 p.m. – 7:30 p.m.

Wednesday – June 17, 2015

Registration	8 a.m. – Noon
Concurrent Sessions	8:30 a.m. – Noon
Explore Vancouver on own	

Thursday – June 18, 2015

Registration	8 a.m. – 5 p.m.
Concurrent Sessions	8:30 a.m. – 5:20 p.m.
Lunch on own	Noon – 1:30 p.m.
Conference Dinner	7 – 9:30 p.m.

Friday – June 19, 2015

Registration	8 a.m. – Noon
Concurrent Sessions	8:30 a.m. – Noon

Organizers

Mrityunjay Singh
Chair
Ohio Aerospace Institute, USA

Tatsuki Ohji
Co-chair
AIST, Japan

Alex Michaelis
Co-chair
Fraunhofer IKTS, Germany

Sponsors

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Plenary Speakers

Dan Arvizu
Director and chief executive, National Renewable Energy Laboratory; president, Alliance for Sustainable Energy LLC, USA
Title: *Maximizing the potential of renewable energy*

Sanjay M. Correa
Vice president, CMC Program, GE Aviation, USA
Title: *CMC applications in turbine engines: Science at scale*

Arthur "Chip" Bottone
President and CEO, FuelCell Energy Inc., USA; managing director, FuelCell Energy Solutions GmbH, Germany
Title: *High-temperature fuel cells delivering clean, affordable power today*

Richard Metzler
Managing director, Rauschert GmbH, Germany
Title: *Energy-efficient manufacturing: What can be done in the technical ceramics industry and which technical ceramic products can help other industries*

Registration rates

	On or before May 4	After May 4
Attendee	$725	$875
Attendee + ACerS New Membership/Renewal	$845	$995
ACerS Senior/Emeritus/Associate Member	$580	$730
One-Day Attendee	$580	$730
Student Attendee	$325	$400
Spouse/Companion	$125	$125

Registrations, except Spouse/Companion, include welcome reception, poster reception, lunch on Monday, coffee breaks, and conference dinner. Spouse/Companion includes only evening receptions and conference dinner.

Hyatt Regency Vancouver

655 Burrard Street, Vancouver, BC, Canada V6C 2R7 | 604-683-1234

Single/Double:	CA$220	Triple:	CA$255
Quad:	CA$290	Student:	CA$165

If you need assistance with travel planning or have questions about the destination, contact Greg Phelps at **gphelps@ceramics.org**.

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Technical Program at a Glance

See full technical program at ceramics.org/11cmcee

T1 - CERAMICS FOR ENERGY CONVERSION, STORAGE, AND DISTRIBUTION SYSTEMS

- T1S1: HIGH-TEMPERATURE FUEL CELLS AND ELECTROLYSIS
- T1S2: CERAMICS-RELATED MATERIALS, DEVICES, AND PROCESSING FOR HEAT-TO-ELECTRICITY DIRECT CONVERSION AIMING AT GREEN AND SUSTAINABLE HUMAN SOCIETY
- T1S3: PHOTOVOLTAIC MATERIALS, DEVICES, AND SYSTEMS
- T1S4: MATERIAL SCIENCE AND TECHNOLOGIES FOR ADVANCED NUCLEAR FISSION AND FUSION ENERGY
- T1S5: FUNCTIONAL NANOMATERIALS FOR SUSTAINABLE ENERGY TECHNOLOGIES
- T1S6: ADVANCED MULTIFUNCTIONAL NANOMATERIALS AND SYSTEMS FOR PHOTOVOLTAIC AND PHOTONIC TECHNOLOGIES
- T1S7: ADVANCED BATTERIES AND SUPERCAPACITORS FOR ENERGY STORAGE APPLICATIONS
- T1S8: MATERIALS FOR SOLAR THERMAL ENERGY CONVERSION AND STORAGE
- T1S9: HIGH TEMPERATURE SUPERCONDUCTORS: MATERIALS, TECHNOLOGIES, AND SYSTEMS

T2 - CERAMICS FOR ENERGY CONSERVATION AND EFFICIENCY

- T2S1: ADVANCED CERAMICS AND COMPOSITES FOR GAS TURBINE ENGINES
- T2S2: ADVANCED CERAMIC COATINGS FOR POWER SYSTEMS
- T2S3: ENERGY EFFICIENT ADVANCED BEARINGS AND WEAR RESISTANT MATERIALS
- T2S4: MATERIALS FOR SOLID STATE LIGHTING
- T2S5: ADVANCED REFRACTORY CERAMIC MATERIALS AND TECHNOLOGIES
- T2S6: ADVANCED NITRIDES AN RELATED MATERIALS FOR ENERGY APPLICATIONS
- T2S7: CERAMICS IN CONVENTIONAL ENERGY, OIL, AND GAS EXPLORATION

T3 - CERAMICS FOR ENVIRONMENTAL SYSTEMS

- T3S1: PHOTOCATALYSTS FOR ENERGY AND ENVIRONMENTAL APPLICATIONS
- T3S2: ADVANCED FUNCTIONAL MATERIALS, DEVICES, AND SYSTEMS FOR ENVIRONMENTAL CONSERVATION AND POLLUTION CONTROL
- T3S3: GEOPOLYMERS, INORGANIC POLYMER CERAMICS AND SUSTAINABLE COMPOSITES
- T3S4: MACROPOROUS CERAMICS FOR ENVIRONMENTAL AND ENERGY APPLICATIONS
- T3S5: ADVANCED SENSORS FOR ENERGY, ENVIRONMENT AND HEALTH APPLICATIONS

T4 - CROSS-CUTTING MATERIALS TECHNOLOGIES

- T4S1: COMPUTATIONAL DESIGN AND MODELING
- T4S2: ADDITIVE MANUFACTURING TECHNOLOGIES
- T4S3: NOVEL, GREEN, AND STRATEGIC PROCESSING AND MANUFACTURING TECHNOLOGIES
- T4S4: POWDER PROCESSING TECHNOLOGY FOR ADVANCED CERAMICS
- T4S5: ADVANCED MATERIALS, TECHNOLOGIES, AND DEVICES FOR ELECTRO-OPTICAL AND BIOMEDICAL APPLICATIONS
- T4S6: MULTIFUNCTIONAL COATINGS FOR ENERGY AND ENVIRONMENTAL APPLICATIONS
- T4S7: MATERIALS FOR EXTREME ENVIRONMENTS: ULTRAHIGH TEMPERATURE CERAMICS (UHTCS) AND NANO-LAMINATED TERNARY CARBIDES AND NITRIDES (MAX PHASES)
- T4S8: CERAMIC INTEGRATION TECHNOLOGIES FOR ENERGY AND ENVIRONMENTAL APPLICATIONS
- T4S9: ENVIRONMENTAL FRIENDLY AND ENERGY EFFICIENT MANUFACTURING ROUTES FOR THE PRODUCTION ROOT TECHNOLOGY
- T4S10: BIO-INSPIRED AND HYBRID MATERIALS
- T4S11: MATERIALS DIAGNOSTICS AND STRUCTURAL HEALTH MONITORING OF CERAMIC COMPONENTS AND SYSTEMS

HONORARY SYMPOSIA

- SYMPOSIUM H1: INNOVATIVE PROCESSING AND MICROSTRUCTURAL DESIGN OF ADVANCED CERAMICS—*A SYMPOSIUM IN HONOR OF PROFESSOR DONGLIANG JIANG*
- SYMPOSIUM H2: MATERIALS PROCESSING SCIENCE WITH LASERS AS ENERGY SOURCES—*A SYMPOSIUM IN HONOR OF PROFESSOR JUERGEN HEINRICH*

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Technical Program

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T1S1: High-temperature Fuel Cells and Electrolysis

Thomas Pfeifer, Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Germany; **Alexander Michaelis**, Fraunhofer IKTS, Germany; **Chan Siew Hwa**, Nanyang Technological University, Singapore; **Prabhakar Singh**, University of Connecticut, USA; **Mihails Kusnezoff**, Fraunhofer IKTS, Germany; **Toshio Suzuki**, AIST, Japan; **R. Muccillo**, Energy and Nuclear Research Institute, Brazil; **Brian Borglum**, Versa Power Systems/Fuel Cell Energy, Canada

T1S2: Ceramics-related Materials, Devices, and Processing for Heat-to-electricity Direct Conversion Aiming at Green and Sustainable Human Societies

Michitaka Ohtaki, Kyushu University, Japan; **Ryoji Funahashi**, AIST, Japan; **Qiang Li**, Brookhaven National Laboratory, USA; **Yuzuru Miyazaki**, Tohoku University, Japan; **Takao Mori**, National Institute for Materials Science, Japan; **Tsunehiro Takeuchi**, Toyota Technological Institute, Japan; **Terry M. Tritt,** Clemson University, USA

T1S3: Photovoltaic Materials, Devices, and Systems

Tohru Sekino, The Institute of Scientific and Industrial Research, Osaka University; **Jin-Hyo Boo**, Sungkyunkwan University, Korea; **Robert Chang**, Northwestern University, USA; **Yoshikazu Suzuki**, Tsukuba University, Japan

T1S4: Material Science and Technologies for Advanced Nuclear Fission and Fusion Energy

Josef Matyas, Pacific Northwest National Laboratory, USA; **Yutai Katoh**, Oak Ridge National Laboratory, USA; **Kyle Brinkman**, Clemson University, USA; **Raghunath Kanakala**, University of Idaho, USA; **Ram Devanathan**, Pacific Northwest National Laboratory, USA; **Jake Amoroso**, Savannah River National Laboratory, USA

T1S5: Functional Nanomaterials for Sustainable Energy Technologies

Sanjay Mathur, University of Cologne, Germany; **Dunwei Wang**, Boston College, USA; **Silke Christiansen**, Max-Planck-Institut for the Science of Light, Germany; **Ausrine Bartasyte**, Université Franche-Comté, France; **Xavier Obrados**, ICAMB, Spain; **Anke Weidenkaff**, University of Stuttgart, Germany; **Yoshitake Masuda**, AIST, Japan; **Taejin Huang**, KITECH, Korea

T1S6: Advanced Multifunctional Nanomaterials and Systems for Photovoltaic and Photonic Technologies

Yoon-Bong Hahn, Chonbuk National University, Korea; **Giovanni Fanchini**, University of Western Ontario, Canada; **Ravi Silva**, University of Surrey, UK; **S. Christiansen**, MPI, Germany; **Yunhang Hu**, Michigan Technological University, USA

T1S7: Advanced Batteries and Supercapacitors for Energy Storage Applications

Palani Balaya, National University of Singapore, Singapore; **Partha P. Mukherjee**, Texas A&M University, USA; **Dany Carlier-Larregaray**, ICMCB-CNRS, France; **Pengjian Zuo**, Harbin Institute of Technology, China; **Robert Dominko**, National Institute of Chemistry, Slovenia; **Kisuk Kang**, Seoul National University, Seoul, Korea; **Neeraj Sharma**, University of New South Wales, Australia

T1S8: Materials for Solar Thermal Energy Conversion and Storage

Dileep Singh, Argonne National Laboratory, USA; **Martin Schmuecker**, DLR, Germany; **A. Oztekin**, Lehigh University, USA; **R. Reddy**, University of Alabama, USA; **J. Gomez**, National Renewable Energy Laboratory, USA; **M. Roeb,** DLR, Institute for Solar Research, Germany; **Chr. Sattler**, DLR, Institute for Solar Research, Germany

T1S9: High-temperature Superconductors: Materials, Technologies, and Systems

Davor Pavuna, EPFL, Switzerland; **Andrea Damascelli**, UBC, Canada; **John Wei**, University of Toronto, Canada; **Christos Panagopoulos**, NTU, Singapore

T2S1: Advanced Ceramics and Composites for Gas Turbine Engines

Hua-Tay Lin, Guangdong University of Technology, China; **Walter Krenkel**, University of Bayreuth, Germany; **Yutaka Kagawa**, University of Tokyo, Japan; **Kang Lee**, Rolls-Royce, USA; **Wei Pan**, Tsinghua University, China; **Hai-Doo Kim**, Korea Institute of Materials Science, Korea; **Yujin Wang**, Harbin Institute of Technology, China; **Ping Xia**, University of Manchester, UK; **David Marshall**, Teledyne Scientific Co., USA; **Laifei Cheng**, Northwestern Polytechnical University, China

T2S2: Advanced Ceramic Coatings for Power Systems

Hagen Klemm, Fraunhofer Institute Ceramic Technologies and Systems, IKTS Dresden, Germany; **Dongming Zhu**, NASA Glenn Research Center, USA; **Satoshi Kitaoka**, Japan Fine Ceramic Center, Japan; **Takashi Goto**, Tohoku University, Japan; **Douglas Wolfe**, Pennsylvania State University, USA; **Soumendra Basu**, Massachusetts Institute of Technology, USA; **Robert Vaßen**, Forschungszentrum Jülich GmbH, Germany; **Uwe Schulz**, DLR, Germany; **Peter Mechnich**, DLR, Germany

T2S3: Energy-efficient Advanced Bearings and Wear-resistant Materials

Junichi Tatami, Yokohama National University, Japan; **Pavol Sajgalik**, Slovak Academy of Sciences, Slovakia; **Hasan Mandal**, Sabanci University, Turkey; **Katsutoshi Komeya**, Yokohama National University, Japan; **Rolf Waesche**, BAM, Germany

T2S4: Materials for Solid-State Lighting

Ralf Riedel, Technical University of Darmstadt, Germany; **Pavol Sajgalik**, SAS Bratislava; **R.J. Xie**, NIMS, Japan; **K. Hirao**, AIST, Japan

T2S5: Advanced Refractory Ceramic Materials and Technologies

James Hemrick, Oak Ridge National Laboratory, USA; **Christos G. Aneziris**, TU Bergakademie Freiberg, Germany; **Valeriy V. Martynenko**, Ukrainian Research Institute of Refractories, Ukraine; **Victor C. Pandolfelli**, Universidade Federal de São Carlos, Brazil; **Josh Pelletier**, Kerneos Aluminate Technologies, USA; **Jeffrey D. Smith**, Missouri University of Science and Technology, USA; **Harald A. Walter**, Refratechnik North America, USA

T2S6: Advanced Nitrides and Related Materials for Energy Applications

Guenter Motz, University of Bayreuth, Germany; **Ralf Riedel**, Technical University of Darmstadt, Germany; **Yoshiyuki Sugahara**, Waseda University, Japan; **Paolo Colombo**, Università di Padova, Italy; **Rajendra K. Bordia**, Clemson University, USA; **Hui Gu**, Shanghai Institute of Ceramics, China

T2S7: Ceramics in Conventional Energy, Oil, and Gas Exploration

Surojit Gupta, University of North Dakota, USA; **Dongsheng Wen**, University of Leeds, UK; **Aiguo Zhou**, Henan Polytechnic University, China

T3S1: Photocatalysts for Energy and Environmental Applications

Wenzhong Wang, Shanghai Institute of Ceramics, China; **Jinhua Ye**, National Institute for Materials Science, Japan; **Lianzhou Wang**, University of Queensland, Australia; **Hexing Li**, Shanghai Normal University, China; **Yongfa Zhu**, Tsinghua University, China; **Chuanyi Wang**, Xinjiang Technical Institute of Physics & Chemistry, China

T3S2: Advanced Functional Materials, Devices, and Systems for Environmental Conservation and Pollution Control

Nobuhito Imanaka, Osaka University, Japan; **Taek-Soo Kim**, Korea Institute of Industrial Technology, Korea; **Youichi Shimizu**, Kyushu Institute of Technology, Japan; **Teng-Ming Chen**, National Chiao Tung University, Taiwan; **Kenji Toda**, Niigata University, Japan; **Toshiyuki Masui**, Osaka University, Japan

T3S3: Geopolymers, Inorganic Polymer Ceramics and Sustainable Composites

Waltraud M. Kriven, University of Illinois at Urbana-Champaign, USA; **Claus H. Rüscher**, Leibniz University of Hannover, Germany; **Sylvie Rossignol**, GEMH-ENSCI, France; **Hubert Rahier**, Vrije Universiteit, Belgium; **John L. Provis**, University of Sheffield, UK

T3S4: Porous and Cellular Ceramics for Filter and Membrane Applications

Ingolf Voigt, Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Germany; **Manabu Fukushima**, AIST, Japan; **Hannes Richter**, Fraunhofer Institute for Ceramic Technolo-

gies and Systems IKTS, Germany; **Paolo Colombo**, Università di Padova, Italy; **Tobias Fey**, Universität Erlangen-Nürnberg, Germany; **Young-Wook Kim**, University of Seoul, Republic of Korea; **Alberto Ortona**, University of Applied Sciences and Arts of Southern Switzerland, Switzerland; **Takashi Shirai**, Nagoya Institute of Technology, Japan; **Sujanto Widjaja**, Corning Incorporated, USA; **Yu-ping Zeng**, Shanghai Institute of Ceramics, China

T3S5: Advanced Sensors for Energy, Environment and Health Applications

Girish Kale, University of Leeds, UK; **Sheikh Akbar,** The Ohio State University, USA; **Yasuhiro Shimizu**, Nagasaki University, Japan; **Sanjay Mathur**, University of Cologne, Germany; **Jong-Huen Lee**, Korea University, Korea; **R. Vasant Kumar**, University of Cambridge, UK, **J.A. Varela**, FAPESP, Brazil

T4S1: Computational Design and Modeling

Jingyang Wang, Shenyang National Laboratory for Materials Science, Institute of Metal Research, Chinese Academy of Sciences, China; **Wai-Yim Ching**, University of Missouri-Kansas City, USA; **Kwang-Ryeol Lee**, Korea Institute of Science and Technology, Korea; **Isao Tanaka**, Kyoto University, Japan; **Hans J. Seifert**, University of Karlsruhe, Germany; **Sean Smith**, University of New South Wales, Australia; **Gerard L. Vignoles**, University of Bordeaux, France; **William J. Weber**, University of Tennessee, USA

T4S2: Additive Manufacturing Technologies

Soshu Kirihara, Osaka University, Japan; **Roger Narayan**, NC State University, USA; **Michael C. Halbig**, NASA Glenn Research Center, USA; **Hiroya Abe**, Osaka University, Japan; **Johannes Homa**, Lithos GmbH, Austria; **Nahum Travizky**, University of Erlangen-Nürnberg, Germany; **Martin Schwentenwein**, Lithos GmbH, Austria

T4S3: Novel, Green, and Strategic Processing and Manufacturing Technologies

Tatsuki Ohji, AIST, Japan; **Surojit Gupta**, University of North Dakota, USA; **Mathias Herrmann**, Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Germany; **Eugene Medvedovski**, Endurance Technologies Inc., Canada; **Richard D. Sisson**, Jr., Worcester Polytechnic Institute, USA; **Michael Stelter**, Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Germany; **Tohru S. Suzuki**, NIMS, Japan; **Junichi Tatami**, Yokohama National University; **Yiquan Wu**, Alfred University, USA; **Guo-Jun Zhang**, Shanghai Insititute of Ceramics, Chinese Academy of Science, China

T4S4: Powder Processing Technology for Advanced Ceramics

Makio Naito, Joining and Welding Research Institute, Osaka University, Japan; **Junichi Tatami**, Yokohama National University, Japan; **Kevin Ewsuk**, Sandia National Laboratories, USA; **Yuji Hotta**, AIST, Japan; **C. C. Huang**, Hosokawa Micron Powder Systems, USA; **Norifumi Isu**, LIXIL Corp., Japan; **Esko I. Kauppinen**, Aalto Univeristy, Finland; **Ungyu Paik**, Hanyang University, Korea; **Tetsuo Uchikoshi**, NIMS, Japan

T4S5: Advanced Materials, Technologies, and Devices for Electro-optical and Biomedical Applications

Kiyoshi Shimamura, NIMS, Japan; Noboru Ichinose, Waseda University, Japan; **Matthias Bickermann**, The Leibniz Institute for Crystal Growth (IKZ), Germany; **Xutang Tao**, Shandong University, China; **Alain Largeteau**, Institute for Solid State Chemistry, Bordeaux, France; **Gen Sazaki**, Hokkaido University, Japan; **Luisa E. Bausá**, Autonomous University of Madrid, Spain

T4S6: Multifunctional Coatings for Energy and Environmental Applications

Jun Akedo, AIST, Japan; **Seiji Kuroda**, NIMS, Japan; **Soshu Kirihara**, University of Osaka, Japan; **Balu Balachandran**, Argonne National Laboratory, USA; **Armelle Vardelle**, University of Limoges, France; **Valentin Craciun**, National Institute for Laser, Plasma, and Radiation Physics, Romania; **Kyoung Il Moon**, Korea Institute of Industrial Technology, Korea; **Sang Sub Kim**, Inha University, Korea; **Minoru Osada**, NIMS, Japan

T4S7: Materials for Extreme Environments: Ultra-high Temperature Ceramics (UHTCs) and Nanolaminated Ternary Carbides and Nitrides (MAX Phases)

Yanchun Zhou, Aerospace Research Institute of Materials & Processing Technology, China; **Jon Binner**, University of Birmingham, UK; **Erica L. Corral**, University of Arizona, USA; **Sea-Hoon Lee,** Korea Institute of Materials Science, Korea; **Per Eklund**, Linköping University, Sweden; **William G. Fahrenholtz**, Missouri University of Science and Technology, USA; **Greg Hilmas**, Missouri University of Science and Technology, USA; **Frederic Monteverde**, Institute of Science and Technology of Ceramics-CNR, Italy; **Miladin Radovic**, Texas A&M University, USA; **Jochen Schneider**, Materials Chemistry, RWTH Aachen, Germany; **Luc J. Vandeperre**, Imperial College London, UK; **Guo-Jun Zhang**, Shanghai Institute of Ceramics, Chinese Academy of Sciences, China

T4S8: Ceramic Integration Technologies for Energy and Environmental Applications

Milena Salvo, Politecnico di Torino, Italy; **Monica Ferraris**, Politecnico di Torino, Italy; **Michael C. Halbig**, NASA Glenn Research Center, USA; **Michael J Reece**, Queen Mary, University of London, UK; **Jacques Lamon**, CNRS LMT ENS Cachan, France; **Tatsuya Hinoki**, Kyoto University, Japan

T4S9: Environmentally-friendly and Energy-efficient Manufacturing Routes for Production Root Technology

Sang Mok Lee, Korea Institute of Industrial Technology (KITECH), Korea; **Sahn Zhong-de**, China Academy of Machinery and Science Technology, China; **L. K. Sharma**, CSIR-Central Glass & Ceramic Research Institute, India; **Martin Fehlbier**, Institut für Produktionstechnik und Logistik, Germany; **Horst Wolff**, IfG - Institute for Foundry Technology, Germany; **Taek Soo Kim**, Korea Institute for Rare Metals, Korea; **Dechang Jia**, Harbin Institute of Technology, China; **Tadachika Nakayama**, Nagaoka University of Technology, Japan

T4S10: Bioinspired and Hybrid Materials

Tadachika Nakayama, Nagaoka University of Technology, Japan; **Roger Narayan**, NC State University, USA; **Seiichi Takami**, Tohoku University, Japan; **Yong-Ho Choa**, Hanyang University, Korea; **Simon Hall**, University of Bristol, UK; **Koji Kuraoka**, Kobe University, Japan; **Ping Xu**, Harbin Institute of Technology, Harbin, China; **Shaifulazuar Bin Rozali**, University of Malaya, Malaysia

T4S11: Materials Diagnostics and Structural Health Monitoring of Ceramic Components and Systems

Joerg Opitz, Fraunhofer Institute for Ceramic Technologies and Systems, Germany; **Andrew L. Gyekenyesi**, Ohio Aerospace Institute, NASA Glenn Research Center, USA; **Qiwen Zhan**, University of Dayton, USA; **P. Terry Murray**, University of Dayton, USA; **Mathias Herrmann**, Fraunhofer Institute for Ceramic Technologies and Systems, Germany; **Klaus-Juergen Wolter**, Electronics Packaging Lab (IAVT), TU Dresden, Germany; **Bernd Koehler**, Fraunhofer Institute for Ceramic Technologies and Systems, Germany; **Peter Czurratis**, PVA TePla Analytical Systems GmbH, Germany; **Juergen Schreiber**, Nuga Lab, Germany; **Viktoryia Lapina**, Academy of Science, Belarus; **Cerasela Zoica Dinu**, West Virginia University, USA; **Ben Dutton**, MTC Limited, UK

HONORARY SYMPOSIA

Symposium H1: Innovative Processing and Microstructural Design of Advanced Ceramics—*A Symposium in Honor of Professor Dongliang Jiang*

Shaoming Dong, Shanghai Institute of Ceramics, China; **Yanchun Zhou**, Aerospace Research Institute of Material & Processing Technology; **Hua-Tay Lin**, Guangdong University of Technology; **Makio Naito**, Osaka University, Japan; **Suk-Joong Kang**, Korea Advanced Institute of Science and Technology, Korea; **Hai-Doo Kim**, Korea Institute of Materials Science, Korea; **Shiwei Wang**, Shanghai Institute of Ceramics, China; **Yi-Bing Cheng**, Monash University, Australia

Symposium H2: Materials Processing Science with Lasers as Energy Sources—*A Symposium in Honor of Professor Juergen Heinrich*

Jens Günster, Federal Institute for Materials Research and Testing, BAM, Germany; **Frank A. Müller**, Friedrich-Schiller-University of Jena, Germany; **Francis Cambier**, INISMa-CRIBC (EMRA), Belgium; **Carina Oelgardt**, H.C. Starck GmbH, Goslar; **Christof Siebert**, TRUMPF Laser- und Systemtechnik GmbH, Germany

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