

Preliminary Program

Ceramic Matrix Composites III

October 26 - 31, 2025

Risonare Yatsugatake
Yamanashi, Japan

Conference Co-Chairs

Ram Darolia, GE Aerospace (ret.), USA
Ken Goto, Japan Aerospace Exploration Agency, Japan
Gerard L. Vignoles, University of Bordeaux, France
Satoshi Kitaoka, Japan Fine Ceramics Center, Japan
Takashi Akatsu, Tokyo University of Technology Japan



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Sunday, October 26, 2025

16:30 – 18:30	Conference check-in
18:30 – 19:00	Reception
19:00 – 20:30	Dinner

Notes and Locations

- *Technical and poster sessions will be in the Teatro Gastronomo.*
- *Lunch will be in the Restaurant Otto Sette. Dinner will be in the Teatro Gastronomo.*
- *The ECI on site office will be in the Four rooms*

Monday, October 27, 2025

- 07:00 – 08:30 Breakfast
- 08:30 – 08:45 **Opening Remarks**
Conference Chair and ECI Liaison: Ram Darolia
- Session 1: CMC For Aircraft Engines**
Chairs: M. Montaudon, E. Bouillon
- 08:45 – 09:15 **The role of micro- and macro-stress distributions in the fracture behavior of SiC/SiC composites and their EBC systems**
Yukata Kagawa, Tokyo University of Technology, Japan
- 09:15 – 09:45 **CMCs for engine components: From elementary lab tests towards engine tests**
Eric Bouillon, Safran Ceramics, France
- 09:45 – 10:15 **Development of CMC applications for aircraft engines at IHI**
Fumiaki Watanabe, IHI Corporation, Japan
- 10:15 – 10:45 Coffee Break
- 10:45 – 11:15 **CMCs at GE Aerospace: Yesterday, today, and tomorrow**
Jared Weaver, GE Aerospace, USA
- 11:15 – 11:45 **Materials challenges in hydrogen-powered aero-turbine engine applications**
Olivier Sudre, Pratt & Whitney, USA
- 11:45 – 12:15 **Challenges for CMCs long-term survivability at 2700°F**
Amjad Almansour, NASA Glenn Research Center, USA
- 12:15 – 12:35 **Present and future of SiC Fier**
Yoshitaka Ito, NGS Advanced Fibers, Japan
- 12:35 – 14:00 Lunch
- Session 2: Environmental and sustainability aspects**
Chairs: J. Weaver
- 14:00 – 14:30 **Exploring the environmental aspects of CMC**
Marc Montaudon, Safran Ceramics, France
- 14:30 – 15:00 **How to consider sustainability in the development of Ceramic Matrix Composites**
Dietmar Koch, University of Augsburg, Germany
- Session 3: CMCs for aerospace applications**
Chairs: J. Binner
- 15:00 – 15:30 **Complex shaped ultra-high temperature Ceramic Matrix Composites and their performance in relevant environments**
Diletta Sciti, National Research Council, Italy
- 15:30 – 16:00 Coffee Break

16:00 – 16:30	UHTCMCs: Manufacture via RMI-process, Characterisation and Wind Tunnel Testing under Hypersonic Conditions Martin Frieß, German Aerospace Center (DLR), Germany
16:30 – 17:00	Manufacturing and qualification of C/SiC thermal protection systems for reusable re-entry vehicle Mario De Stefano Fumo, Italian Aerospace Research Centre, Italy
17:00 – 17:20	CMC materials for Aerospace applications Massimiliano Valle, Petroceramics SpA, Italy
17:20 – 18:00	Discussion Leader: Frank Zok
18:00 – 19:00	Networking / Free time
19:00 – 20:30	Dinner

Tuesday, October 28, 2025

07:00 – 08:00 Breakfast

Session 4: Processing and Characterization

Chairs: D. Koch, M. Dickerson

08:00 – 08:30 **Processing CMCs With Controlled and Variable Matrix Composition**

Jon Binner, University of Birmingham, UK

08:30 – 09:00 **Recycled and Alternative Thermoplastic Precursors for the Fabrication of C/C-SiC Ceramic Matrix Composites**

Stefan Schafföner, University of Bayreuth, Germany

09:00 – 09:30 **Microwave-assisted Chemical Vapor Infiltration processing of large SiC_r/SiC preforms with different geometries**

Roberto D'Ambrosio, Institute for Chemical and Physical processes (IPCF-CNR), Italy

09:30 – 10:00 Coffee Break

10:00 – 10:30 **From dental cement to damage tolerant CMCs**

Erin Valenzuela, University of Birmingham, UK

10:30 – 11:00 **Preceramic Polymer Grafted Nanoparticles: Tailorable Hybrid Systems Towards CMC Fabrication**

Mathew Dickerson, Air Force Research Laboratory, USA

11:00 – 11:30 **From Polymer to Ceramic: SLA-Based 3D Printing and Pyrolysis of Silicon Oxycarbide Structures**

Hamidreza Yazdani Sarvestani, National Research Council Canada, Canada

11:30 – 12:00 **Agile CMC fabrication through continuous fiber 3D printing and on-head matrix impregnation**

Derek King, Miller Advanced Research and Solutions Center, USA

12:30 Depart hotel (sandwiches for lunch on bus)

12:45 – 17:00 Visit Suwataisya upper-main shine, Togariishi Jomon archeology museum, and free time (Group will be split in half for the tours)

17:45 Return to hotel

Dinner on your own

Wednesday, October 29, 2025

07:00 – 08:30 Breakfast

Session 4: Processing and Characterization (continued)

Chairs: D. Sciti, T. Pruyn

08:30 – 09:00 **SiC Fiber Developed via a Curing-Free Process Using Highly Branched Precursor**

Ryo Iuchi, KUREHA Corporation, Japan

09:00 – 09:20 **Innovative approaches to SiC fiber fabric manufacturing and processing challenges**

Aya Maki, Toyota Industries Corporation, Japan

09:20 – 9:50 **Study of CVD BN coating using B-N precursor for the interphase of SiC/SiC composites**

Takahiro Sekigawa, Tokyo University of Technology, Japan

9:50 – 10:20 Coffee Break

10:20 – 10:50 **Analysis of infiltration and reaction properties in Si reactive melt infiltration process using high-temperature in-situ observations**

Takeshi Yoshikawa, The University of Osaka, Japan

10:50 – 11:20 **Boron's role in enhancing SiC/SiC composites**

Georges Chollon, LCTS - CNRS, France

11:20 – 11:50 **Synthesis, constituents, and processing technologies for UHTCMCs**

Timothy Pruyn, Air Force Research Laboratory, USA

12:00 – 14:00 Lunch

Session 5: Physical and Mechanical Property Testing and Characterization

Chairs: F. Zok, K. Goto

14:00 – 14:30 **A survey of multiple scientific challenges addressed at LCTS on C_f/C composites**

Gerard Vignoles, University of Bordeaux, LCTS, France

14:30 - 15:00 **Characterization of SiC/SiC CMCs systems under thermal and mechanical loadings: from elementary specimens to more complex geometries**

Thibaut Archer, ONERA, France

15:00 – 15:20 **Structure & Properties of Textile reinforcements for Ceramics Matrix Composite**

Takeshi Tanamura, Shikibo Ltd, Japan

15:20 – 15:50 Coffee Break

15:50 - 16:20 **Towards disk-compression test method for the determination of interlaminar tensile strength of ceramic matrix composites**

Abhendra Singh, Baylor University, USA

16:20 - 16:50	In situ observation of damage evolution in SiC/SiC under loading using X-ray Talbot-Lau interferometry and its applicability Yoshihisa Tanaka, Tokyo University of Technology, Japan
16:50 – 17:20	The usefulness and optimization of acoustic emission for monitoring damage in ceramic matrix composites Gregory Morscher, University of Akron, USA
17:20 - 17:50	Damage Evolution Analysis of Ceramic Matrix Composites by Acoustic Emission Manabu Enoki, Tokyo University of Technology, Japan
17:50 – 18:20	Discussion Leader: G. Vignoles
19:20 – 20:50	Dinner
20:50 – 22:00	Poster Session

Thursday, October 30, 2025

07:00 – 08:30	Breakfast
	<u>Session 5: Physical and Mechanical Property Testing and Characterization (continued)</u> Chairs: F. Zok, K. Goto
08:30 – 09:00	High temperature behaviour of an oxide/oxide L-shape component Stéphanie Miot, IRT Saint-Exupéry, France
09:00 – 09:30	Enhanced structural versatility in short fibre-reinforced UHTCMCS Matteo Mor, CNR-ISSMC, Italy
09:30 – 10:00	Coffee Break
	<u>Session 6: Modeling and Simulation</u> Chairs: G. Vignoles
10:30 – 11:00	Beyond Averages: Modeling and Diagnosing Stochastic Failure in SiC/SiC Composites Frank Zok, University of California Santa Barbara, USA
11:00 – 11:30	The Impact of Fiber Arrangements in Unidirectional CMCs: Simulations to Provide Processing Targets Mathew Begley, University of California Santa Barbara, USA
11:30 – 12:00	Interpretable Machine Learning Modeling of Formation Process of Ceramic Materials Using the Precursor Polymer Method Yoh-ichi Mototake, Hitotsubashi University, Japan
12:00 – 13:30	Lunch

Session 7: Environmental Behavior and Protective Coatings

Chairs: C. Levi, S. Kitaoka

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| 13:30 – 14:00 | Borosilicate glass: Challenges for predicting SiC/BN/SiC oxidation resistance
Elizabeth Opila, University of Virginia, USA |
| 14:00 – 14:30 | Mechanical properties of SiC-based matrix and C_f/SiC CMCs fabricated via PIP process up to 2000°C
Sea Hoon Lee, Korea Institute of Materials Science, South Korea |
| 14:30 – 15:00 | Diffusion of species as determining factor for the performance of oxide/oxide ceramic matrix composites
Peter Mechnich, German Aerospace Center (DLR), Germany |
| 15:00 – 15:30 | Coffee Break |
| 15:30 – 16:00 | Oxidation resistance of C_f/ZrB₂-SiC composites fabricated by different techniques: SPS, PIP and LSI
Antonio Vinci, Institute of Science, Technology and Sustainability for Ceramics – National Research Council, Italy |
| 16:00 – 16:30 | Aligned carbon/ceramic hybrid fibers with improved oxidation resistance
Günter Motz, University of Bayreuth, Germany |
| 16:30 – 16:50 | Development of novel Ox/Ox CMCs with high thermal stability using Uniform Doping Method (UDM) of fibers
Isao Yamashita, Tosoh Corporation, Japan |
| 16:50 – 19:30 | Networking / Free time |
| 19:30 – 21:30 | Conference Banquet |

Friday, October 31, 2025

07:00 – 08:30 Breakfast

Session 8: Environmental Barrier Coatings

Chairs: E. Opila

08:30 – 09:00 **The Challenge of Molten Silicate Deposits to the Implementation of Environmental Barrier Coatings on CMCs in Gas Turbines**
Carlos Levi, University of California, Santa Barbara, USA

09:00 – 09:30 **Thermochemical design of EBCs to mitigate against CMAS attack**
Satoshi Kitaoka, Japan Fine Ceramics Center, Japan

10:00 – 10:30 **Exploration of EBC Materials with CMAS Corrosion Resistance**
Naoki Yamazaki, IHI Corporation, Japan

10:30 – 11:00 Coffee Break

11:00 – 12:00 **General Discussion – Areas for further research, development and collaboration, Next conference**
Ram Darolia, Gerard Vignoles, Ken Goto

12:00 - 13:30 Lunch

Departures

Poster Presentations

- 1. Development of novel Ox/Ox CMCs with high thermal stability using Uniform Doping Method (UDM) of fibers**
Isao Yamashita, Tosoh Corporation, Japan (Oral 108)
- 2. Present and future of SiC Fiber**
Yoshitaka Ito, NGS Advanced Fibers, Japan (Oral 147)
- 3. Innovative approaches to SiC fiber fabric manufacturing and processing challenges**
Aya Maki, Toyota Industries Corporation, Japan (Oral 144)
- 4. Influence of local microstructural features on oxidation and volatilization in dry and wet air and their impact on composite strength**
Shingo Kanazawa, IHI Americas Inc., Japan (Oral 117)
- 5. Structure & Properties of Textile reinforcements for Ceramics Matrix Composite**
Takeshi Tanamura, Shikibo Ltd, Japan (Oral 124)
- 6. Matrix Development for Non-Oxide Ceramic Matrix Composites based on the Weak Matrix Concept**
Georg Puchas, University of Bayreuth, Germany (Oral 104)
- 7. Inter-ply reinforcement of oxide-oxide ceramic matrix composites for improved interlaminar strength**
Wylie Simpson, Axiom Materials Inc., USA (Oral 110)
- 8. Overview of the Miller Advanced Research and Solutions (MARS) Center for advanced manufacturing of ceramic matrix composites**
Benjamin Garcia, Weber State University, USA (Oral 121)
- 9. Development of SiCSiC composite for LWR application**
Satoru Kuboya, Toshiba Energy Systems & Solutions Corporation, Japan (Oral 125)
- 10. Microcrack Detection with Low-data: A Patch-Based Approach**
Kodai Abe, Tokyo University of Technology, Japan (Oral 129)
- 11. Intermediate Temperature Oxidation of Melt Infiltrated SiC/BN/SiC CMCs**
Sarah Beth Holles, University of Virginia, USA (Oral 133)
- 12. Robot Assisted Diagonal Hole Drilling of SiC-CMC by Hybrid ArF Excimer Laser**
Takashi Onose, Gigaphoton Inc., Japan (Oral 142)
- 13. Selection and Evaluation of Carbon Fibers for NITE-Processed C/SiC Composites**
Sanghyun Jung, Korea Institute of Materials Science, South Korea (Oral 151)
- 14. Mechanisms and Challenges in the Machining of CMC Materials**
Ralf Goller, Technical University of Applied Sciences, Germany (Oral 161)
- 15. Advanced Multicomponent R₂TiO₅-Based TBCs for Enhanced Thermal Protection in Jet Engines**
Makoto Tanaka, Japan Fine Ceramics Center, Japan (Poster 102)

- 16. AI image diagnosis of damage cracks in SiC/SiC composite materials**
Masaki Kotani, Japan Aerospace Exploration Agency, Japan (Poster 103)
- 17. Comparative Evaluation of the Mechanical Properties of Al₂O₃/Al₂O₃ Composites Exposed to Air and Steam at High Temperatures**
Ryoma Aoki, Japan Aerospace Exploration Agency, Japan (Poster 104)
- 18. Evaluating Cmc Damages with X-ray Talbot-lau Interferometry and Other Methods: Challenges and Progress**
Takanori Kamagata, IHI Corporation, Japan (Poster 105)
- 19. Effect of fiber on strength degradation of Al₂O₃/Al₂O₃ in high temperature steam environment**
Ken Goto, Japan Aerospace Exploration Agency, Japan (Poster 106)
- 20. Influence of Carbon Structure on Zirconium Infiltration in UHTCMC Fabrication by Melt Infiltration Method**
Yuki Nakanishi, Research & Innovation Center, Mitsubishi Heavy Industries, Ltd., Japan (Poster 107)
- 21. Quantifying spatial correlation of fiber breaks in SiC/SiC CMCs using X-ray computed tomography**
Shane Gallagher, University of California, Santa Barbara, USA (Poster 108)
- 22. Modeling stress evolution during SiC fiber oxidation**
Isaac Duan, University of California, Santa Barbara, USA (Poster 109)
- 23. Monofilament fibers as a proxy for multifilaments: Effects of oxidation on strength**
Annika DeVol, University of California, Santa Barbara, USA (Poster 110)
- 24. A Computational Framework for Investigating Load Transfer around Fiber Breaks in Ceramic Matrix Composites**
Ryan Chambers, University of California, Santa Barbara, USA (Poster 111)