

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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Previous conferences in this series

***Advanced Ceramic Matrix Composites:
Science and Technology of Materials, Design,
Applications, Performance and Integration***

November 5 - 9, 2017

Santa Fe, New Mexico, USA

Conference Chairs:

Yutaka Kagawa, Tokyo University of Technology, Japan

Dongming Zhu, NASA Glenn Research, USA

Ram Darolia, GE Aviation (retired), USA

Rishi Raj, University of Colorado, Boulder, USA

***Ceramic Matrix Composites II: Science and Technology of Materials,
Design, Applications, Performance and Integration***

November 13 – 18, 2022

Santa Fe, New Mexico, USA

Conference Chairs:

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Yutaka Kagawa, Tokyo University of Technology, Japan

Dietmar Koch, University of Augsburg, Germany

Rishi Raj, University of Colorado, USA

Gerard Vignoles, University of Bordeaux, France

Japanese contributors to the CMC field

Hiroshi Ichikawa, Nippon Carbon Co., Ltd. (retired)



Dr. Hiroshi Ichikawa has made outstanding contributions to the field of Ceramic Matrix Composites (CMC) through his pioneering research on the design and development of advanced silicon carbide fibers, interface engineering using optimized fiber coatings, and the integrated design of materials at Nippon Carbon.

He has played a key role in bridging research and industry by promoting the commercialization of CMC fiber technologies and advancing scale-up and manufacturing process development. He is well known as “Mr. Nicalon.” Without this fine-diameter SiC fibers, the development and practical applications of CMC would not have realized.

Teruo Kishi, Professor Emeritus, The University of Tokyo



Prof. Emeritus, Teruo Kishi has made pioneering contributions to the fundamental research and development of Ceramic Matrix Composites, including material design, interface control, improvement of thermal resistance, elucidation of fracture behavior, and establishment of technologies for enhancing durability and reliability.

Furthermore, he has made outstanding contributions to Japan's advanced materials development through his leadership in providing policy recommendations to the government and industry, supporting the formulation of strategic materials policies, and strengthening the nation's industrial technology infrastructure.

Japanese contributors to the CMC field

Taketami Yamamura, Ultra-High Temperature Materials Research Center (retired)



Dr. Taketami Yamamura, had led the development of SiC fibers, “Tyrano Fiber” at Ube Industries Ltd., and made a significant contribution to the development of ceramic composite materials that exhibit today's excellent properties. Also, he had made significant contributions to the advancement of ceramic matrix composites and related ultra-high-temperature ceramic materials in Japan as the founding President of Ultra-High Temperature Materials Research Center. Furthermore, he contributed to the formulation of national materials strategies and research policies, and dedicated himself to mentoring the next generation of materials researchers.

Conference Sponsors



IHI Corporation



TOSOH CORPORATION



CMC Consortium

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.*
- *Audio, still photo and video recording by any device (e.g., cameras, cell phones, laptops, PDAs, watches) is strictly prohibited during the technical sessions, unless the author and ECI have granted prior permission.*
- *Speakers – Please have your presentation loaded onto the conference computer prior to the session start (preferably the day before).*
- *Speakers – Please leave at least 3 minutes for questions and discussion.*
- *Please do not smoke at any conference functions.*
- *Turn your mobile telephones to vibrate or off during technical sessions.*
- *After the conference, ECI will send an updated participant list to all participants. Please check your listing now and if it needs updating, you may correct it at any time by logging into your ECI account.*
- *Emergency Contact Information: Because of privacy concerns, ECI does not collect or maintain emergency contact information for conference participants. If you would like to have this information available in case of emergency, please use the reverse side of your name badge.*

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: E. Bouillon, K. Gato
- 08:45 – 09:15 **Activities and recent research outcomes of the Center for Ceramic Matrix Composites (CCMC)**
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**
Suresh Viswanathan, 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 **Present and future of SiC Fiber**
Yoshitaka Ito, NGS Advanced Fibers, Japan
- 12:15 – 12:35 Free time / networking
- 12:35 – 14:00 Lunch
- Session 2: CMCs for aerospace applications**
Chairs: J. Binner, Y. Kagawa
- 14:00 – 14:30 **Complex shaped ultra-high temperature Ceramic Matrix Composites and their performance in relevant environments**
Diletta Sciti, National Research Council, Italy
- 14:30 – 15:00 **UHTCMCs: Manufacture via RMI-process, characterisation and wind tunnel testing under hypersonic conditions**
Martin Frieß, German Aerospace Center (DLR), Germany
- 15:00 – 15:30 **Manufacturing and qualification of C/SiC thermal protection systems for reusable re-entry vehicle**
Mario De Stefano Fumo, Italian Aerospace Research Centre, Italy
- 15:30 – 16:00 Coffee Break

Monday, October 27, 2025 (continued)

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|---------------|--|
| 16:00 – 16:30 | CMC materials for Aerospace applications
Massimiliano Valle, Petroceramics SpA, Italy |
| 16:30 – 17:00 | Development of SiCSiC composite for LWR application
Satoru Kuboya, Toshiba Energy Systems & Solutions Corporation, Japan |
| 17:00 – 17:40 | Discussion
Leader: Frank Zok |
| 17:40 – 20:00 | Networking / Free time |
| 20:00 – 21:30 | Dinner |

Tuesday, October 28, 2025

07:00 – 08:00 Breakfast

Session 3: Processing and Characterization

Chair: D. Koch

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_f/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 **Agile CMC fabrication through continuous fiber 3D printing and on-head matrix impregnation**
Derek King, Miller Advanced Research and Solutions Center, USA

10:30 – 11:00 **From polymer to ceramic: SLA-based 3D printing and pyrolysis of silicon oxycarbide structures**
Hamidreza Yazdani Sarvestani, National Research Council Canada, Canada

11:00 – 11:30 **Joining of Ceramic Matrix Composites**
Monica Ferraris, J-Tech@PoliTO - Politecnico di Torino, Italy

12:15 **Meet in lobby to board buses**

12:30 **Depart hotel for excursion** (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)

Chair: D. Sciti

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 – 12:00 Free time / networking

12:00 – 14:00 Lunch

Session 5: Physical and Mechanical Property Testing and Characterization

Chairs: F. Zok, Y. Kagawa

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 - 14:50 **Structure & properties of textile reinforcements for Ceramics Matrix Composite**
Takeshi Tanamura, Shikibo Ltd, Japan

14:50 – 15:20 **Characterization of SiC/SiC CMCs systems under thermal and mechanical loadings: from elementary specimens to more complex geometries**
Thibaut Archer, ONERA, France

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

Wednesday, October 29, 2025 (continued)

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|---------------|--|
| 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 |
| 18:20 – 20:20 | Poster Session |
| 20:20 – 21:50 | Dinner |

Thursday, October 30, 2025

07:00 – 08:30 Breakfast

Session 5: Physical and Mechanical Property Testing and Characterization (continued)

Chair: S. Denneulin

08:30 – 09:00 **High temperature behaviour of an oxide/oxide L-shape component**
Emilie Perret, IRT Saint-Exupery, France

09:00 – 09:30 **Enhanced structural versatility in short fibre-reinforced UHTCMCS**
Matteo Mor, CNR-ISSMC, Italy

09:30 – 10:00 Coffee Break

Session 6: Modeling and Simulation

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 **Interpretable machine learning modeling of formation process of ceramic materials using the precursor polymer method**
Yoh-ichi Mototake, Hitotsubashi University, Japan

11:30 – 12:00 **The impact of fiber arrangements in unidirectional CMCs: Simulations to provide processing targets**
Mathew Begley, University of California Santa Barbara, USA

12:00 – 13:30 Lunch

Session 7: Environmental Behavior and Protective Coatings

Chairs: C. Levi, S. Kitaoka

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

Thursday, October 30, 2025 (continued)

- 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
- Session 7: Environmental and sustainability aspects**
Chair: T. Akatsu
- 16:50 – 17:20 **Exploring the environmental aspects of CMC**
Sébastien Denneulin, Safran Ceramics, France
- 17:20 – 17:50 **How to consider sustainability in the development of Ceramic Matrix Composites**
Dietmar Koch, University of Augsburg, Germany
- 17:50 – 18:30 Networking / Free time
- 18:30 – 19:20 **Miyasaka Brewing Company “Masumi Sake” presentation and tasting**
Naotaka Miyasaka and Keith Norum, Miyasaka Brewing Company, Japan
- 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 **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

11:30 – 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
- 2. Present and future of SiC Fiber**
Yoshitaka Ito, NGS Advanced Fibers, Japan
- 3. Innovative approaches to SiC fiber fabric manufacturing and processing challenges**
Aya Maki, Toyota Industries Corporation, Japan
- 4. Structure & Properties of Textile reinforcements for Ceramics Matrix Composite**
Takeshi Tanamura, Shikibo Ltd, Japan
- 5. Matrix development for non-oxide Ceramic Matrix Composites based on the weak matrix concept**
Georg Puchas, University of Bayreuth, Germany
- 6. Inter-ply reinforcement of oxide-oxide ceramic matrix composites for improved interlaminar strength**
Wylie Simpson, Axiom Materials Inc., USA
- 7. Overview of the Miller Advanced Research and Solutions (MARS) Center for advanced manufacturing of ceramic matrix composites**
Benjamin Garcia, Weber State University, USA
- 8. Microcrack detection with low-data: A patch-based approach**
Kodai Abe, Tokyo University of Technology, Japan
- 9. Intermediate temperature oxidation of melt infiltrated SiC/BN/SiC CMCs**
Sarah Beth Holles, University of Virginia, USA
- 10. Robot assisted diagonal hole drilling of SiC-CMC by hybrid ArF excimer laser**
Takashi Onose, Gigaphoton Inc., Japan
- 11. Selection and evaluation of carbon fibers for NITE-processed C/SiC composites**
Sanghyun Jung, Korea Institute of Materials Science, South Korea
- 12. Advanced multicomponent R2TiO5-based TBCs for enhanced thermal protection in jet engines**
Makoto Tanaka, Japan Fine Ceramics Center, Japan
- 13. AI image diagnosis of damage cracks in SiC/SiC composite materials**
Masaki Kotani, Japan Aerospace Exploration Agency, Japan
- 14. 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
- 15. Evaluating CMC damages with X-ray Talbot-lau Interferometry and other methods: Challenges and progress**
Takanori Kamagata, IHI Corporation, Japan

- 16. Effect of fiber on strength degradation of $\text{Al}_2\text{O}_3/\text{Al}_2\text{O}_3$ in high temperature steam environment**
Ken Goto, Japan Aerospace Exploration Agency, Japan
- 17. Influence of carbon structure on zirconium infiltration in UHTCMC fabrication by melt infiltration method**
Yuki Nakanishi, Research & Innovation Center, Mitsubishi Heavy Industries, Ltd., Japan
- 18. Quantifying spatial correlation of fiber breaks in SiC/SiC CMCs using X-ray computed tomography**
Shane Gallagher, University of California, Santa Barbara, USA
- 19. Modeling stress evolution during SiC fiber oxidation**
Isaac Duan, University of California, Santa Barbara, USA
- 20. Monofilament fibers as a proxy for multifilaments: Effects of oxidation on strength**
Annika DeVol, University of California, Santa Barbara, USA
- 21. A computational framework for investigating load transfer around fiber breaks in ceramic matrix composites**
Ryan Chambers, University of California, Santa Barbara, USA