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

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Editors:

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Monday, November 6, 2017

07:00 - 08:45	Breakfast
08:45 - 09:00	Opening Remarks Conference Chair: Yutaka Kagawa ECI Conference Technical Liaison: Ram Darolia
	Session I: Plenary Session Session Chairs: Yutaka Kagawa and Ram Darolia
09:00 - 09:45	**Keynote: Development and commercialization of GE's ceramic matrix composites (CMCs) for aircraft engines** .....1 Krishan Luthra, GE Global Research, USA
09:45 - 10:15	**High temperature composite overview in France** .....2 Marc Montaudon, Eric Bouillon, Safran Ceramics
10:15 - 10:45	**Application of CMC materials into aero-engines .....3** Kuniyuki Imanari, IHI Corporation, Japan
10:45 - 11:15	Coffee break
11:15 - 11:45	**ONR and NAVY Research in Ceramic Matrix composites systems for advanced naval engines .....4** David Shifler, Office of Naval Research, USA
11:45 - 12:15	**Overview of NASA transformational tools and technologies Project's 2700°F CMC/EBC Technology Challenge** .....5 Janet B. Hurst, NASA Glenn Research Center, USA
12:15 - 12:40	**Ceramic matrix composites at GE Aviation .....6** Jim Steibel, General Electric Aviation, USA
12:40 - 14:00	Lunch break
	Session 2: Integrated Design and Applications – 1 Session Chairs: Yutaka Kagawa and Dongming Zhu
14:00 - 14:25	**Fiber creep and rupture models for design of advances high-temperature SiC-based ceramic matrix Composites** .....7 James DiCarlo, NASA Glenn Research Center, USA
14:25 - 14:50	**Progress of silicon carbide fibers and their application to ceramic matrix composites** .....8 Michio Takeda, NGS Advanced Fibers Co., Ltd, Japan

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14:50 - 15:15	**Ceramic composites for high temperature aerospace structures and propulsion systems** .....9 David Marshall, University of Colorado, USA Olivier Sudre, Teledyne Scientific Company, Thousand Oaks, CA; Brian Cox, Arachne Consulting, Sherman Oaks, CA
15:15 - 15:40	**Twenty years of experience with carbon/ceramic brakes: Status and perspectives .....10** Walter Krenkel, University of Bayreuth, Germany
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	Session 2: Integrated Design and Applications – 2 Session Chairs: Dongming Zhu and Rishi Raj
16:00 - 16:25	**Overview of ceramic matrix composite research at NASA Glenn Research Center .....11** James D. Kiser et al, NASA Glenn Research Center, USA
16:25 - 16:50	**Informatics based structure-property linkages for transverse strength of ceramic matrix composites .....12** Dipen Patel, Triplicane Parthasarathy, Daniel Rapking, Michael Braginsky, Craig Przybyla, Air Force Research Laboratory, USA
16:50 - 17:15	**Engineering framework for Safran interlocked ceramics components .....13** David Marsal, Eric Bouillon, Nicolas Laval, Safran Ceramics
17:15 - 17:40	**SiC-based ceramic matrix composite behavior enhancement for gas turbines hot sections** .....14 Eric Bouillon, Nicolas Laval, David Marsal, Safran Ceramics, France
17:40 - 18:05	**Updated Composite Materials Handbook-17 (CMH-17) Volume 5 - Ceramic Matrix Composites .....15** James Doug Kiser, NASA Glenn Research Center, USA
18:30 - 20:00	Dinner
20:00 - 21:30	**Poster Session/Social hour (*Sponsored by CoorsTek, Inc.)***

Tuesday, November 7, 2017

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09:50 - 10:15	**Creep durability of 3D woven SiC/SiC composites with (CVI+PIP) hybrid matrix .....18** R.T. Bhatt, OAI/NASA Glenn Research Center, USA
10:15 - 10:40	**SiC fibers and SiC/SiC ceramic matrix minicomposites damage behavior .....19** Amjad Almansour, NASA Glenn Research Center, USA
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11:10 - 11:35	**Image analysis, synthesis and image-based modeling of ceramic-matrix composites .....20** Gerard L. Vignoles, University of Bordeaux, France
11:35 - 12:00	**Effect of fiber distributions on the mechanical performance of CMC materials: Virtual manufacturing and testing approach .....21** Wooseok Ji, Hye-gyu Kim, Ulsan National Institute of Science and Technology, Korea
12:00 - 12:25	**Effect of mechanical machining on surface roughness of CMCs .....22** Ralf Goller, Achim Rösiger, Augsburg University of Applied Sciences
12:30	Pick up boxed lunch
12:45	Buses depart for excursion to Optional Excursion to Bandelier National Monument followed by stop at Santa Fe Brewing Company (drinks on your own). After excursion: Dinner on your own in Santa Fe

Wednesday, November 8 2017

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09:50 - 10:15	**Multi-scale modeling of damage and delaminations failure in ceramic matrix composites .....26** Rajesh S. Kumar, UTRC/Pratt & Whitney, USA
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16:00 - 16:25	**CMAS challenges to CMC-T/EBC systems .....36** Carlos Levi, D.L. Poerschke, W. Summers, J.H. Shaw, R.W. Jackson, D. Park, K.M. Grant, N. Verma, F.W. Zok, University of California Santa Barbara, USA
16:25 - 16:50	**Boria effects on the oxidation mechanisms of SiC/BN/SiC CMCs .....37** Elizabeth Opila, Valentina Avincola, Bohuslava McFarland, Megan Wilson, Madeline Morales, University of Virginia, USA
16:50 - 17:15	**Issues of advanced ceramic matrix composites in aeroengine applications .....38** Sung R. Choi, Naval Air Systems Command, Patuxent River, USA
17:15 - 17:40	**Calcium-magnesium alumino-silicates (CMAS) reaction mechanisms and resistance of advanced turbine environmental barrier coatings - SiC/SiC ceramic matrix composites** .....39 Dongming Zhu, Gustavo Costa, Bryan Harder, Valerie L. Wiesner, Janet B. Hurst NASA Glenn Research Center, USA

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17:40 - 18:05 **Degradation of oxide/Si/(SiC/SiC) model environmental barrier coatings system after unexpected melting condition of Si bond coat layer** .....N/A
Yutaka Kagawa, Yutaro Arai, Tokyo University of Technology, Japan

19:30 - 21:30 Conference Banquet

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	Session 7: Environmental Barrier Coatings-1: Processing and Test Development Session Chairs: Hagen Klemm and Kang Lee
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09:25 - 09:50	**Advanced design of EBC based on mass-transfer mechanisms in oxides under oxygen potential gradients at high temperatures .....41** Satoshi Kitaoka, Tsuneaki Matsudaira, Masashi Wada, Taishi Yokoi, Masasuke Takata, Japan Fine Ceramics Center, Japan
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10:15 - 10:40	**Development of NASA's advanced environmental barrier coatings for SiC/SiC composites: Prime-reliant design and durability perspectives .....43** Dongming Zhu, NASA GRC, USA
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11:25 - 11:50	**Failure resistant thermal and environmental barrier coating concepts** .....45 Haydn Wadley, University of Virginia, USA
11:50 - 12:15	**An evaluation method for interface toughness of environmental barrier coatings (EBCs) on ceramic matrix composites (CMCs) .....46** Hideki Kakisawa, National Institute for Materials Science, Japan
12:15 - 12:40	**Development of thermally sprayed environmental barrier coatings .....47** Emine Bakan, Caren Sophia Gatzen, Daniel Emil Mack, Robert Vaßen, Forschungszentrum Jülich GmbH, Germany
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Poster Presentations