

Advanced Materials and Manufacturing Workshop
September 9-11, 2014
iWireless Center • Moline, Illinois • USA
AGENDA

Tuesday, September 9 (Evening)

5:30-8:30 PM Presentation, Vendor Display, and Reception

The Poster Session will be held during the reception.

Scheduled Speakers Include:

William Ratzburg, Quad City Manufacturing Hub

Eric Johnson, John Deere Technology Center

Wednesday, September 10

8:00 AM Introductory Comments Eric Faierson, Organizing Committee Chair

8:10 AM Introductory Comments
Ms. Heidi Schultz will be speaking on behalf of Congresswoman Cheri Bustos from the 17th Congressional District

8:20 AM Introductory Comments
Colonel Luders, Rock Island Arsenal

8:30 AM Introductory Comments
Quad Cities Regional Advanced Manufacturing Innovation Hub (QCMIH)

8:50 AM Advanced Materials and Manufacturing at QCML: Eric Faierson¹;
¹Quad City Manufacturing Laboratory and Western Illinois University

Additive Manufacturing I

9:20 AM Invited
Transitioning Additive (3D Printing) to Manufacturing at GE: *James Sears*¹; ¹GE GRC

9:55 AM "3D Printing" - Sorting out Fact from Fiction - A Primer to Help Industry Exploit this 'New' Technology: *Peter Collins*¹; ¹University of North Texas

10:10 AM Break

10:30 AM Microstructure, Properties, and Part Evaluation of Powder Bed Additively Manufactured Stainless Steels: John Smugeresky¹; *David Keicher*²; J. Anthony Romero²; ¹Sandia National Laboratories, CA; ²Sandia National Laboratories, NM

10:50 AM High Power Welding, Cladding, and Heat Treating with the Latest in Fiber Laser Technology: *David Krattley*¹; ¹IPG Photonics

Friction Stir Welding

- 11:10 AM Invited
Twenty Years of Innovations in Friction Stir Welding: Challenges and Opportunities: *Rajiv Mishra*¹; ¹University of North Texas
- 11:40 AM LENS® Process of 316L Stainless Steel and Ti-6Al-4V Alloys: *Fuyao Yan*¹; ¹ Northwestern University
- 12:00 PM to 1:20 PM Lunch on own

Casting

- 1:20 PM Invited
The Future for Casting: *John Campbell*¹; ¹University of Birmingham
- 2:00 PM Additive Manufacturing for Metal Castings: *Sairam Ravi*¹; ¹University of Northern Iowa
- 2:20 PM Metal Casting Design and Manufacturing Optimization: *Jiten Shah*¹; ¹Product Development & Analysis (PDA) LLC
- 2:40 PM Break

Powder Production

- 3:00 PM Invited
Development of an Augmented Close-Coupled Gas Atomization Process for Metal Powder Production with Controlled Intensity: *Iver Anderson*¹; *Joel Rieken*¹; *Andrew Heidloff*²; *Andrew Mullis*³; ¹Ames Laboratory; ²Iowa State University; ³University of Leeds
- 3:30 PM Quality Control Measures Critical to the Adoption Of Sustainable Additive Manufacturing Component Production: *John Hunter*¹; *Robert Deffley*²; ¹LPW Technology, Inc.; ²LPW Technology, Ltd.
- 3:50 PM Ultra Hard Materials – BAM in Extreme Applications: *Peter Hong*¹; ¹New Tech Ceramics
- 4:10 PM Development of Gas Atomization Method to Produce Precursor Powder for Fe-Based Magnetic Materials: *Andrew Heidloff*¹; *Joel Rieken*²; *Iver Anderson*³; *David Byrd*³; ¹Iowa State University; ²Ames Laboratory; ³Ames Laboratory
- 4:30 PM Effect of Minor Elements on Properties of C300 Maraging Steel Part by SLM Process: *Satyajeet Sharma*¹; *Satya Kudapa*¹; *Montia Nestler*¹; ¹Sulzer Metco
- 5:30 PM Workshop Dinner – Johnny’s Italian Steakhouse

Thursday, September 11

Computational Modeling

- 8:00 AM Introductory Comments Eric Faierson, Organizing Committee Chair
- 8:05 AM Invited
CALPHAD-related ICME Research for Advanced Manufacturing: *Wei Xiong*¹;
¹Northwestern University
- 8:35 AM Physics-based Modeling of Microstructural Alteration in Machining: *Hongtao Ding*¹;
¹University of Iowa
- 8:55 AM The Application of CALPHAD Based Tools to Advanced Materials and Manufacturing:
*Paul Mason*¹; *Qing Chen*²; *Anders Engstrom*²; *Johan Bratberg*²; ¹Thermo-Calc Software
Inc.; ²Thermo-Calc Software AB
- 9:15 AM QuesTek's Integrated Computational Materials Engineering Approach to the Design of
Materials for Additive Manufacturing: *Jason Sebastian*¹; *David Snyder*¹; *Jiadong Gong*¹;
*Gregory Olson*¹; ¹QuesTek Innovations
- 9:35 AM to Tours to Quad City Manufacturing Laboratory (QCML) and Rock Island Arsenal
12:00 PM

Attendees must pre-register for the Thursday morning tour.

- 12:05 PM to Lunch on own
1:00 PM

Additive Manufacturing II

- 1:00 PM Simulation and Characterization of E-beam and Laser Additive Manufacturing Processes:
*Cao Jun*¹; *Le Tao*¹; *John Hasier*¹; *Philip Nash*¹; *Matt Gonser*²; *Bjørn Clausen*³; ¹Illinois
Institute of Technology; ²Northern Illinois University; ³Los Alamos National Laboratory
- 1:30 PM Moving NDT/E from Finished Part to a Total Quality Management Tool for Metal Powder
Processing: *Leonard Bond* ¹; *J. N. Gray*¹; *Frank Margetan*¹; *Iver Anderson*²; *Andrew
Heidloff*²; *Joel Rieken*²; ¹Center for Nondestructive Evaluation, Iowa State University;
²Ames Laboratory and Materials Science & Engineering, Iowa State University
- 1:50 PM Understanding Energy Requirements for Additive Manufacturing: *Matt Gonser*¹;
*Federico Sciammarella*¹; *Milivoje Kostic*¹; *Daniel Nikolov*¹; ¹Northern Illinois University
- 2:10 PM Adding Value to Existing Components with 3D Printing Techniques: *Richard Grylls*¹;
¹Optomec Inc.

2:30 PM Analysis of Additive Manufacturing via Acoustic Emission: Federico Sciammarella¹; David Prine¹; *Justin Whiting*¹; ¹Northern Illinois University

2:50 PM CALPHAD Aided Design and Development of Fire-Resistant Steels: *Cameron Gross*¹; Dieter Isheim¹; Semyon Vaynman¹; Morris Fine¹; Yip-Wah Chung¹; ¹Northwestern University

3:10 PM Break

Composites

3:30 PM Invited
Lightweight, High Damping Composite Materials: *William Pratt*¹; ¹Western Illinois University

4:00 PM Characterization of Novel Aluminum-Carbon based Materials called Covetics: Sabrina Nilufar¹; *Iwona Jasiuk*¹; ¹University of Illinois at Urbana-Champaign

4:20 PM Laser Deposited In Situ TiC Reinforced Nickel Matrix Composites: Microstructure and Tribological Properties: *Tushar Borkar*¹; John Sosa²; Junyeon Hwang; Thomas Scharf¹; Jaimie Tiley³; Hamish Fraser²; Rajarshi Banerjee¹; ¹University of North Texas; ²The Ohio State University; ³US Air Force Research Laboratory

4:40 PM Consolidation of Al₂O₃ and Additive Free β -SiC via Spark Plasma Sintering: A Comparison of Model and Experiment: *Thomas Carlson*¹; Jeffrey Allen¹; Charles Cornwell¹; Charles Marsh¹; ¹USACE

5:00 PM Closing Remarks & Adjourn