

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 17<sup>th</sup> 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 Faierson<sup>1</sup>;  
<sup>1</sup>Quad City Manufacturing Laboratory and Western Illinois University

**Additive Manufacturing I**

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

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

10:10 AM Break

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

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

## Friction Stir Welding

- 11:10 AM Invited  
Twenty Years of Innovations in Friction Stir Welding: Challenges and Opportunities: *Rajiv Mishra*<sup>1</sup>; <sup>1</sup>University of North Texas
- 11:40 AM Manufacturing Variable Influences on 1-in. Thick Section Aluminum Friction Stir Welds: *Michael Eff*<sup>1</sup>; <sup>1</sup>EWI
- 12:00 PM to 1:20 PM Lunch on own

## Casting

- 1:20 PM Invited  
The Future for Casting: *John Campbell*<sup>1</sup>; <sup>1</sup>University of Birmingham
- 2:00 PM Additive Manufacturing for Metal Castings: *Sairam Ravi*<sup>1</sup>; <sup>1</sup>University of Northern Iowa
- 2:20 PM Metal Casting Design and Manufacturing Optimization: *Jiten Shah*<sup>1</sup>; <sup>1</sup>Product 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*<sup>1</sup>; Joel Rieken<sup>1</sup>; Andrew Heidloff<sup>2</sup>; Andrew Mullis<sup>3</sup>; <sup>1</sup>Ames Laboratory; <sup>2</sup>Iowa State University; <sup>3</sup>University of Leeds
- 3:30 PM Quality Control Measures Critical to the Adoption Of Sustainable Additive Manufacturing Component Production: *John Hunter*<sup>1</sup>; Robert Deffley<sup>2</sup>; <sup>1</sup>LPW Technology, Inc.; <sup>2</sup>LPW Technology, Ltd.
- 3:50 PM Ultra Hard Materials – BAM in Extreme Applications: *Peter Hong*<sup>1</sup>; <sup>1</sup>New Tech Ceramics
- 4:10 PM Development of Gas Atomization Method to Produce Precursor Powder for Fe-Based Magnetic Materials: Andrew Heidloff<sup>1</sup>; Joel Rieken<sup>2</sup>; *Iver Anderson*<sup>3</sup>; David Byrd<sup>3</sup>; <sup>1</sup>Iowa State University; <sup>2</sup>Ames Laboratory; <sup>3</sup>Ames Laboratory
- 4:30 PM Effect of Minor Elements on Properties of C300 Maraging Steel Part by SLM Process: *Satyajeet Sharma*<sup>1</sup>; Satya Kudapa<sup>1</sup>; Montia Nestler<sup>1</sup>; <sup>1</sup>Sulzer 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*<sup>1</sup>;  
1Northwestern University
- 8:35 AM      Physics-based Modeling of Microstructural Alteration in Machining: *Hongtao Ding*<sup>1</sup>;  
1University of Iowa
- 8:55 AM      The Application of CALPHAD Based Tools to Advanced Materials and Manufacturing:  
*Paul Mason*<sup>1</sup>; Qing Chen<sup>2</sup>; Anders Engstrom<sup>2</sup>; Johan Bratberg<sup>2</sup>; 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*<sup>1</sup>; David Snyder<sup>1</sup>; Jiadong Gong<sup>1</sup>;  
Gregory Olson<sup>1</sup>; 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*<sup>1</sup>; *Le Tao*<sup>1</sup>; John Hasier<sup>1</sup>; Philip Nash<sup>1</sup>; Matt Gonser<sup>2</sup>; Bjørn Clausen<sup>3</sup>; 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* <sup>1</sup>; J. N. Gray<sup>1</sup>; Frank Margetan<sup>1</sup>; Iver Anderson<sup>2</sup>; Andrew  
Heidloff<sup>2</sup>; Joel Rieken<sup>2</sup>; 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*<sup>1</sup>;  
Federico Sciammarella<sup>1</sup>; Milivoje Kostic<sup>1</sup>; Daniel Nikolov<sup>1</sup>; 1Northern Illinois University
- 2:10 PM      Adding Value to Existing Components with 3D Printing Techniques: *Richard Grylls*<sup>1</sup>;  
1Optomec Inc.

2:30 PM Analysis of Additive Manufacturing via Acoustic Emission: Federico Sciammarella<sup>1</sup>; David Prine<sup>1</sup>; *Justin Whiting*<sup>1</sup>; <sup>1</sup>Northern Illinois University

2:50 PM CALPHAD Aided Design and Development of Fire-Resistant Steels: *Cameron Gross*<sup>1</sup>; Dieter Isheim<sup>1</sup>; Semyon Vaynman<sup>1</sup>; Morris Fine<sup>1</sup>; Yip-Wah Chung<sup>1</sup>; <sup>1</sup>Northwestern University

3:10 PM Break

### **Composites**

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

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

4:20 PM Laser Deposited In Situ TiC Reinforced Nickel Matrix Composites: Microstructure and Tribological Properties: *Tushar Borkar*<sup>1</sup>; John Sosa<sup>2</sup>; Junyeon Hwang; Thomas Scharf<sup>1</sup>; Jaimie Tiley<sup>3</sup>; Hamish Fraser<sup>2</sup>; Rajarshi Banerjee<sup>1</sup>; <sup>1</sup>University of North Texas; <sup>2</sup>The Ohio State University; <sup>3</sup>US Air Force Research Laboratory

4:40 PM Consolidation of Al<sub>2</sub>O<sub>3</sub> and Additive Free  $\beta$ -SiC via Spark Plasma Sintering: A Comparison of Model and Experiment: *Thomas Carlson*<sup>1</sup>; Jeffrey Allen<sup>1</sup>; Charles Cornwell<sup>1</sup>; Charles Marsh<sup>1</sup>; <sup>1</sup>USACE

5:00 PM Closing Remarks & Adjourn