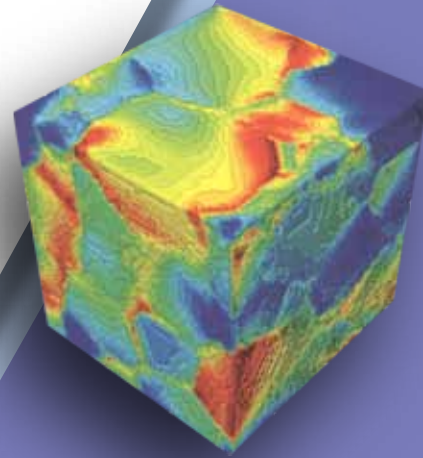


1<sup>st</sup> International Conference on

**3DIMS**

3D Materials Science, 2012



# PROGRAM PREVIEW

**July 8-12, 2012 • Seven Springs Mountain Resort  
Seven Springs, Pennsylvania, USA**

**Register by June 7, 2012 and save!**

[www.tms.org/Meetings/Specialty/3D2012](http://www.tms.org/Meetings/Specialty/3D2012)

**Sponsored by:**

**TMS**

The Minerals, Metals & Materials Society (TMS) and the TMS  
Advanced Characterization, Testing and Simulation Committee



# International Conference on 3D Materials Science, 2012

## REGISTER NOW for the International Conference on 3D Materials Science, 2012!

Experience the first TMS specialty conference focused on this critical growth area of 3D materials science. This event will facilitate and promote rapid advancements in 3D materials science throughout the world. The goal is to provide the premier forum for presentations of current interest and significance to the three-dimensional characterization, visualization, quantitative analysis, modeling, and investigation of structure-property relationships of materials.

**Register by June 7, 2012 and save \$100 off the registration fee!**

## ORGANIZERS & ADVISORS

### Organizing Committee:

- Alexis Lewis** ..... U.S. Naval Research Laboratory, USA
- Marc De Graef** ..... Carnegie Mellon University, USA
- Henning Poulsen** ..... Risø National Laboratory and DTU, Denmark
- Jeff Simmons** ..... U.S Air Force Research Laboratory, USA
- George Spanos** ..... TMS, USA

### International Advisory Committee:

- Dominique Bernard** ..... ICMCB - Pessac, France
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- Katja Schladitz** ..... Fraunhofer ITWN, Germany
- David Seidman** ..... Northwestern University, USA
- Gary Shiflet** ..... University of Virginia, USA
- Marco Stampanoni** ..... ETH Zurich, Switzerland
- Philip Withers** ..... University of Manchester, UK

### Registration

All conference attendees including authors, presenters, and session chairs are required to register. To receive the advance registration rate, register at:

[www.tms.org/Meetings/Specialty/3D2012](http://www.tms.org/Meetings/Specialty/3D2012) by June 7, 2012.

### Registration Fees

	Through June 7, 2012	After June 7, 2012
Member	\$575	\$675
Nonmember*	\$690	\$790
Student Member*	\$375	\$375
Student Nonmember*	\$475	\$475

\* Copy of student school identification card must accompany form.

\* Includes TMS Membership for 2012.

### Registration package includes:

- Technical sessions
- Conference proceedings CD-ROM
- Access to the exhibition
- Round-trip transportation to/from Pittsburgh International Airport
- Sunday welcome reception
- Monday, Tuesday, and Wednesday poster sessions and social hour
- Wednesday barbecue

*Online registration will remain open through June 22. After this date you must register on-site.*

## NETWORKING & SOCIAL EVENTS

### Sunday, July 8

Welcome Reception • 8:25 – 9:25 p.m.

### Monday, July 9

Social Hour • 10:05 – 11:05 p.m.

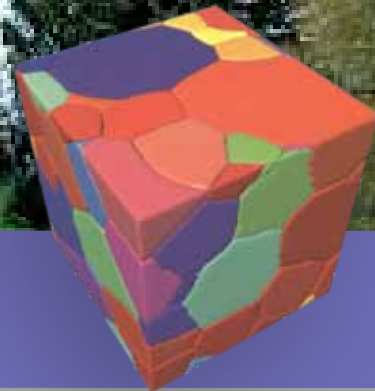
### Tuesday, July 10

Social Hour • 10:05 – 11:05 p.m.

### Wednesday, July 11

Conference Barbecue • 4:30 – 6:30 p.m.

Social Hour • 10:05 – 11:05 p.m.



## TECHNICAL PROGRAM

## HOUSING & TRAVEL

The 3D Materials Science technical program will include invited and contributed presentations on these symposia topics:

- Digital Representation of 3D Microstructures
- Microstructure Property Relationships in 3D
- Image Processing of 2D and 3D Microstructural Data
- 3D Interfaces and Microstructural Evolution
- Experimental Techniques for 3D Data Acquisition
- Storing and Sharing 3D Data
- Future Directions & Challenges for 3D Materials Science

### Technical Sessions

All presentations will be held in the Sunburst Forum or Exhibit Hall of Seven Springs Mountain Resort. Interactive discussions will follow invited presentations during each session.

To view the conference session sheets, visit the 3D Materials Science Technical Program page at:

[www.tms.org/Meetings/Specialty/3D2012/techprog.aspx](http://www.tms.org/Meetings/Specialty/3D2012/techprog.aspx)

A block of rooms has been reserved at **Seven Springs Mountain Resort** at a special rate. Accommodations must be secured by **June 7, 2012**.

Reservations include lodging in the main hotel and a coupon for complimentary breakfast each day. Single occupancy is **\$143/night** and double occupancy is **\$157/night**. Government employees must complete the PDF housing form and fax it to **814-352-2010** to receive the government rate. **Government identification is required when checking into the resort.**

Accommodations may be reserved by visiting:

[www.tms.org/Meetings/specialty/3D2012/housing.aspx](http://www.tms.org/Meetings/specialty/3D2012/housing.aspx)

### Getting There

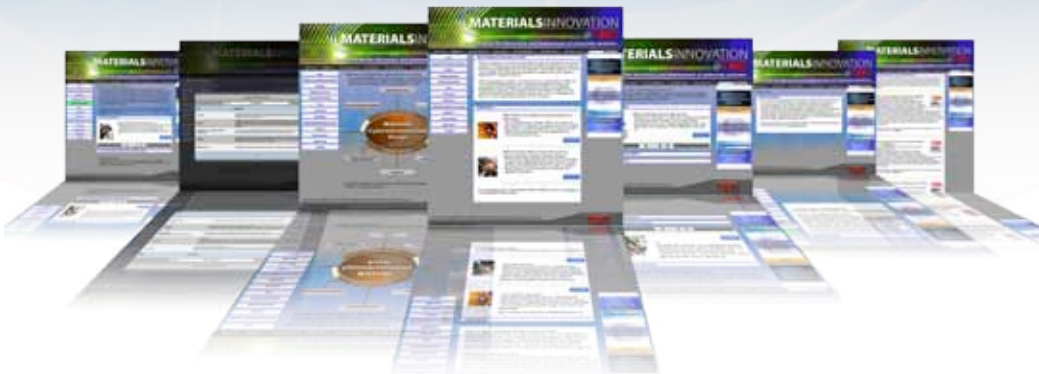
Seven Springs Mountain Resort is located approximately one hour southeast of Pittsburgh. It is easily accessible off exits 91 or 110 of the Pennsylvania Turnpike. Pittsburgh International Airport is the nearest metropolitan terminal.

### Complimentary Shuttle Service

Round-trip shuttle service to/from Pittsburgh International Airport will be available on Sunday and Thursday afternoons. You must complete the transportation requirement section of the registration form to secure shuttle service to/from the airport or to attend the 3D Microstructural Studies Workshop.

### Visit the TMS 3D Materials Repository and Materials Cyberinfrastructure Portal Booth!

Upload your 3D experimental and simulations data to the **3D Materials Atlas** and access online materials innovation tools and databases at the **Materials Cyberinfrastructure Portal**, both accessible at this booth! TMS staff will be on hand to assist you with both of these valuable resources that offer the support you need to effectively interact with other researchers on 3D data sets, and implement materials and manufacturing innovation approaches and concepts.





# International Conference on 3D Materials Science, 2012

## EXHIBIT & SPONSORSHIP INFORMATION

Reservations are being accepted for a networking-focused tabletop exhibit relevant to session topics.

Corporate sponsorships offer high visibility at the conference receptions, coffee and refreshment breaks, and attendee social activities, as well as registration amenities, such as reusable canvas bags, badges, and lanyards.

For more information on exhibiting or purchasing a corporation sponsorship, visit:

[www.tms.org/Meetings/specialty/3D2012/sponsorship.aspx](http://www.tms.org/Meetings/specialty/3D2012/sponsorship.aspx).

## ABOUT THE VENUE Seven Springs Mountain Resort

The Seven Springs Mountain Resort also offers a multitude of on-site activities including a 6,685-yard, 18-hole golf course, as well as a tennis center, volleyball area, year-round swimming pool, exercise room, racquetball courts, bowling lanes, indoor miniature golf, family recreation center with video games, and numerous hiking trails surrounding the resort. Additional fees may apply.

For details on booking your accommodations please visit the 3D Materials Conference web page at:

[www.tms.org/Meetings/Specialty/3D2012/housing.aspx](http://www.tms.org/Meetings/Specialty/3D2012/housing.aspx)



### 2012 Methods for 3D Microstructural Studies Workshop July 13-14, 2012 • Carnegie Mellon University Pittsburgh, Pennsylvania, USA

**Register Now** for this related educational event to continue the discussion cultivated at the 3D Materials Science Conference 2012. The workshop will combine lectures and hands-on exercises using the facilities at Carnegie Mellon University.

#### Focus

- Computational and experimental methodologies for characterization of 3D microstructures and grain boundary properties
- Quantifying and predicting microstructural evolution
- Linking materials properties to 3D microstructures

**Advance registration for this two-day event will end June 7, 2012.**

Workshop registration is offered on the 3D Materials Science Conference 2012 registration form.

For more information on this workshop, visit: <http://www.tms.org/meetings/2012/3dworkshop/home.aspx>

For information on Housing, visit: <http://www.tms.org/meetings/2012/3dworkshop/housing.aspx>



# SCHEDULE AT-A-GLANCE

	Sunday, July 8	Monday, July 9	Tuesday, July 10	Wednesday, July 11	Thursday, July 12
8:15 AM		Session 1: Applications of 3D Experimental Techniques Across Length Scales	Session 5: Microstructure-Property Relationships in 3D	Session 9: 3D Interfaces and Microstructural Evolution	Session 13: Future Directions in 3D Materials Science
9:45 AM		Discussion	Discussion	Discussion	Coffee Break
10:00 AM		Break	Break	Break	
10:15 AM		Session 2: Applications of 3D Experimental Techniques Across Length Scales: Destructive Techniques Session 3: Applications of 3D Experimental Techniques Across Length Scales: Structure-Property Relationships	Session 6: Microstructure-Property Relationships in 3D: Fatigue, Failure and Deformation Session 7: Microstructure-Property Relationships in 3D: Characterization and Simulation	Session 10: 3D Interfaces and Microstructural Evolution: Boundaries and Grain Growth Session 11: 3D Interfaces and Microstructural Evolution: Structure and Morphology	Session 13 (cont.)
11:15 AM		Coffee Break	Coffee Break	Coffee Break	
11:30 AM		Session 2 (cont.)   Session 3 (cont.)	Session 6 (cont.)   Session 7 (cont.)	Session 10 (cont.)   Session 11 (cont.)	Panel Discussion
12:30 PM		Free Time	Free Time	Free Time	
4:00 PM		Poster Session 1: 3D Interfaces, Microstructural Evolution, Structure-Property Relationships	Poster Session 2: Image Processing, Digital Representations of 3D Microstructures, and Applications of 3D Experimental Techniques	Student Poster Session	
5:30 PM		Free Time	Free Time	Conference BBQ	
6:30 PM		Session 4: Image Processing of 2D and 3D Microstructural Data	Session 8: Digital Representation of 3D Microstructures	Session 12: Applications of 3D Experimental Techniques Across Length Scales: Non-Destructive Techniques	
7:30 PM	Plenary Session	Discussion	Discussion	Discussion	
8:25 PM	Welcome Reception	Session 4 (cont.)	Session 8 (cont.)	Session 12 (cont.)	
8:45 PM		Coffee Break	Coffee Break	Coffee Break	
8:45 PM		Session 4 (cont.)	Session 8 (cont.)	Session 12 (cont.)	
10:05 PM		Social Hour	Social Hour	Social Hour	



# International Conference on 3D Materials Science, 2012

## SCHEDULE OF EVENTS

### Sunday, July 8, 2012

#### Plenary Session Room: Exhibit Hall

7:30 PM	<b>Introductory Comments</b>
7:35 PM	<b>Plenary: Perspectives on Materials Science in 3D:</b> Dorte Juul Jensen <sup>1</sup> ; <sup>1</sup> DTU Risø

### Monday, July 9, 2012

#### Session 1: Applications of 3D Experimental Techniques Across Length Scales Room: Exhibit Hall

8:15 AM	<b>Invited: Development of Multi-modal 3D Characterization Systems to Quantify Grain &amp; Precipitate Microstructural Features in Aerospace Alloys:</b> Michael Uchic <sup>1</sup> ; Michael Groeber <sup>1</sup> ; Megna Shah <sup>2</sup> ; Patrick Callahan <sup>1</sup> ; Adam Shiveley <sup>3</sup> ; Michael Chapman <sup>3</sup> ; <sup>1</sup> Air Force Research Laboratory; <sup>2</sup> UES, Inc.; <sup>3</sup> SOCHÉ
8:45 AM	<b>Invited: Three-dimensional Characterization of Dislocation-Defect Interactions:</b> Ian Robertson <sup>1</sup> ; Josh Kacher <sup>1</sup> ; <sup>1</sup> University of Illinois at Urbana-Champaign
9:15 AM	<b>Invited: Acquisition of 3-D Datasets for Property Prediction:</b> Tresa Pollock <sup>1</sup> ; McLean Echlin <sup>1</sup> ; Alessandro Mottura <sup>1</sup> ; Chris Torbet <sup>1</sup> ; <sup>1</sup> University of California Santa Barbara
9:45 AM	<b>Question and Answer Period</b>
10:00 AM	<b>Break</b>

#### Session 2: Applications of 3D Experimental Techniques Across Length Scales: Destructive Techniques Room: Exhibit Hall

10:15 AM	<b>3D Multi-scale Electron Microscopy for Nano-scale Carbide Mapping in a Tempered 9 Cr Martensitic Steel:</b> Niven Monsegue <sup>1</sup> ; Xin Jin <sup>2</sup> ; Nana Kwame Yamoah <sup>1</sup> ; Jeff Hawk <sup>3</sup> ; William Reynolds <sup>1</sup> ; Ge Wang <sup>1</sup> ; Mitsuhiro Murayama <sup>1</sup> ; <sup>1</sup> Virginia Tech; <sup>2</sup> Tsinghua University; <sup>3</sup> U.S. Department of Energy
10:35 AM	<b>Combining Atom-Probe Tomography with Focused-Ion Beam Microscopy for Targeted 3D Materials Characterization with Sub-Nanometer Resolution:</b> Dieter Isheim <sup>1</sup> ; David Seidman <sup>1</sup> ; <sup>1</sup> Northwestern University
10:55 AM	<b>3D Orientation Imaging with Transmission Electron Microscopy:</b> Søren Schmidt <sup>1</sup> ; Haihua Liu <sup>2</sup> ; Andy Godfrey <sup>3</sup> ; Henning Poulsen <sup>1</sup> ; Xiaoxu Huang <sup>1</sup> ; <sup>1</sup> Risoe DTU, Technical University of Denmark; <sup>2</sup> California Institute of Technology; <sup>3</sup> Tsinghua University
11:15 AM	<b>Break</b>
11:30 AM	<b>Electron Tomography in Aberration-Corrected Transmission Electron Microscopes:</b> Peter Ercius <sup>1</sup> ; <sup>1</sup> National Center for Electron Microscopy
11:50 AM	<b>New Horizons in Knife Edge Scanning Microscopy:</b> Matthew Goodman <sup>1</sup> ; Todd Huffman <sup>1</sup> ; Cody Daniel <sup>1</sup> ; Yoonsuck Choe <sup>2</sup> ; <sup>1</sup> 3Scan; <sup>2</sup> Brain Networks Labs
12:10 PM	<b>FIB/SEM Determination of Sub-Surface Damage Caused by Micro-Tribology Scratching of WC/Co Hardmetal Samples:</b> Mark Gee <sup>1</sup> ; Ken Mingard <sup>1</sup> ; Andrew Gant <sup>1</sup> ; Helen Jones <sup>1</sup> ; <sup>1</sup> National Physical Laboratory

**Session 3: Applications of 3D Experimental Techniques Across Length Scales: Structure-Property Relationships**  
**Room: Sunburst**

10:15 AM	<b>Atom-Probe Tomography and the Science of a New Class of High-Temperature Al-Sc Based Alloys:</b> David Seidman <sup>1</sup> ; David Dunand <sup>1</sup> ; <sup>1</sup> Northwestern University
10:35 AM	<b>3D Investigation of Cracking Behavior in a Ni Superalloy:</b> Andrew Deal <sup>1</sup> ; David Rowenhorst <sup>2</sup> ; Brandon Laflen <sup>1</sup> ; Ian Spinelli <sup>1</sup> ; Anthony Barbuto <sup>1</sup> ; Yuchi Huang <sup>1</sup> ; Timothy Hanlon <sup>1</sup> ; <sup>1</sup> GE Global Research; <sup>2</sup> Naval Research Laboratory
10:55 AM	<b>Building Three Dimensional Microstructure of AA5754 Aluminum Sheet for Formability Simulation:</b> Jonathan Rossiter <sup>1</sup> ; Kaan Inal <sup>1</sup> ; Raja Mishra <sup>2</sup> ; <sup>1</sup> University of Waterloo; <sup>2</sup> General Motors R&D
11:15 AM	<b>Break</b>
11:30 AM	<b>The Influence of Microstructure on 3D Crack Morphologies in a New Naval Steel:</b> Marie Cox <sup>1</sup> ; David Rowenhorst <sup>2</sup> ; Richard Fonda <sup>2</sup> ; <sup>1</sup> National Research Council Postdoctoral Fellow; <sup>2</sup> U.S. Naval Research Laboratory
11:50 AM	<b>Shock Damage in Three Dimensions:</b> Veronica Livescu <sup>1</sup> ; John Bingert <sup>1</sup> ; Ellen Cerreta <sup>1</sup> ; Darcie Dennis-Koller <sup>1</sup> ; Davis Tonks <sup>1</sup> ; <sup>1</sup> Los Alamos National Laboratory
12:10 PM	<b>Characterization and Modeling Via Three-Dimensional Reconstructions of Laser Welds in Stainless Steel:</b> Jonathan Madison <sup>1</sup> ; <sup>1</sup> Sandia National Laboratories

4:00 – 5:30 PM

**Poster Session 1: 3D Interfaces, Microstructural Evolution, Structure-Property Relationships**  
**Room: Exhibit Hall**

**3D Analysis of Surface Blisters, Subsurface Bubbles, and Underlying Microstructures of Implanted Metals:** John Smugeresky<sup>1</sup>; Dan Huber<sup>2</sup>; Robert Kolasinski<sup>1</sup>; Don Cowgill<sup>1</sup>; John Sosa<sup>2</sup>; Hamish Fraser<sup>2</sup>; <sup>1</sup>Sandia National Laboratories, CA; <sup>2</sup>Ohio State University

**3D Characterization of Recrystallization Boundaries:** Yubin Zhang<sup>1</sup>; Dorte Juul Jensen<sup>1</sup>; <sup>1</sup>Danish-Chinese Center for Nanometals, Materials Research Division, Risø National Laboratory for Sustainable Energy, Technical University of Denmark

**3D Microstructural Architectures for Metal and Alloy Components Fabricated by 3D Printing/Additive Manufacturing Technologies:** E. Martinez<sup>1</sup>; L. E. Murr<sup>1</sup>; K. Amato<sup>1</sup>; J. Hernandez<sup>1</sup>; P. Shindo<sup>1</sup>; S. Gaytan<sup>1</sup>; D. Ramirez<sup>1</sup>; F. Medina<sup>2</sup>; R. Wicker<sup>2</sup>; <sup>1</sup>University of Texas at El Paso, Metallurgical and Materials Engineering; <sup>2</sup>University of Texas at El Paso, W. M. Keck Center for 3D Innovation

**3D Microstructural Characterization of Uranium Oxide as a Surrogate Nuclear Fuel: Effect of Oxygen Stoichiometry on Grain Boundary Distributions:** Karin Rudman<sup>1</sup>; Patricia Dickerson<sup>2</sup>; Darrin Byler<sup>2</sup>; Robert Dickerson<sup>2</sup>; Harn Lim<sup>1</sup>; Robert McDonald<sup>1</sup>; Pedro Peralta<sup>1</sup>; Kenneth McClellan<sup>2</sup>; <sup>1</sup>Arizona State University; <sup>2</sup>Los Alamos National Laboratory

**A Three Dimensional EBSD Investigation on the Distribution of Recrystallization Embryo in the Grain Boundary Regions of a Cold Rolled Low Carbon Steel:** Nasima Afrin<sup>1</sup>; Md Zakaria Quadir<sup>1</sup>; Michael Ferry<sup>1</sup>; <sup>1</sup>University of New South Wales

**A Toolbox for Geometric Grain Boundary Characterization:** Krzysztof Glowinski<sup>1</sup>; Adam Morawiec<sup>1</sup>; <sup>1</sup>Institute of Metallurgy and Materials Science, Polish Academy of Sciences

**An EBSD-based Characterization of Fe-9Ni and Fe-12Mn Martensitic Steels:** Christopher Kinney<sup>1</sup>; Ken Pytlewski<sup>1</sup>; Y. Adachi<sup>2</sup>; J.W. Morris<sup>1</sup>; <sup>1</sup>University of California, Berkeley; <sup>2</sup>Kagoshima University

**Application of 3-D EBSD to Bainitic Microstructures in Low Carbon Structural Steels:** Joacim Hagström<sup>1</sup>; Bevis Hutchinson<sup>1</sup>; Oskar Karlsson<sup>1</sup>; Peter Hedström<sup>2</sup>; Annika Borgenstam<sup>2</sup>; Peter Kolmskog<sup>2</sup>; Bartłomiej Winiarski<sup>3</sup>; Philip Withers<sup>3</sup>; Ali Gholinia<sup>3</sup>; <sup>1</sup>SwereaKIMAB AB; <sup>2</sup>Royal Inst. Technology; <sup>3</sup>The University of Manchester

**Atomic Density Function 3D Modeling of Crystal Growth with Different Symmetry:** Helena Zapolsky<sup>1</sup>; Armen Khachaturyan<sup>1</sup>; Renaud Patte<sup>1</sup>; <sup>1</sup>University of Rouen

**Computing Fatigue Properties of Polycrystalline Ni-based Superalloy Microstructures using an Image-based Computational Approach:** Bin Wen<sup>1</sup>; Nicholas Zabaraz<sup>1</sup>; <sup>1</sup>Materials Process Design and Control Laboratory

**Defects in Graphene and Their Effects on Three-dimensional Structure and Adsorption in Porous Carbons:** James Morris<sup>1</sup>; Yungok Ihm<sup>2</sup>; Junjie Guo<sup>2</sup>; Cristian Contescu<sup>1</sup>; Nidia Gallego<sup>1</sup>; Gerd Duscher<sup>2</sup>; Stephen Pennycook<sup>1</sup>; Matthew Chisholm<sup>1</sup>; <sup>1</sup>Oak Ridge National Laboratory; <sup>2</sup>University of Tennessee

**Effect of Grain Boundary Properties on Evolution of Lattice Orientations:** Jaehyung Cho<sup>1</sup>; Chang-Seok Oh<sup>1</sup>; <sup>1</sup>Korea Institute of Materials Science

**Elastic Behavior of the Percolating Eutectic Structure of a High Pressure Die Cast Magnesium Alloy:** Bao Zhang<sup>1</sup>; Anumalasetty Nagasekhar<sup>1</sup>; Carlos Caceres<sup>1</sup>; <sup>1</sup>The University of Queensland

**Fragmentation of a Steel Ring under Explosive Loading:** Jeremy Schreiber<sup>1</sup>; Ivi Smid<sup>1</sup>; Timothy Eden<sup>1</sup>; <sup>1</sup>Penn State



# International Conference on 3D Materials Science, 2012

**Gas Fast Reactors Fuel Claddings: Braids Densification Simulations and Equivalent Thermal Conductivities Calculations:** Sylvain Chupin<sup>1</sup>; Patrick David<sup>1</sup>; Denis Rochais<sup>1</sup>; Francois Guillet<sup>1</sup>; Laurent Chaffron<sup>2</sup>; <sup>1</sup>CEA-Le Ripault; <sup>2</sup>CEA-Saclay

**Gating System Optimisation Design Study of a Cast Automobile Component Made in Aluminium Alloy:** Eytayo Olakanmi<sup>1</sup>; <sup>1</sup>Federal University of Technology

**Grain Boundary Networks in Polycrystalline Materials: Understanding Structure/Property Relationships:** Alexis Lewis<sup>1</sup>; Andrew Geltmacher<sup>1</sup>; Siddiq Qidwai<sup>1</sup>; <sup>1</sup>Naval Research Laboratory

**In-situ Investigation of Damage and Strain Mechanisms in Structural Sheet Material via Synchrotron Radiation Laminography:** Thilo Morgener<sup>1</sup>; Lukas Helfen<sup>2</sup>; Francois Hild<sup>3</sup>; Henry Proudhon<sup>1</sup>; Ian Sinclair<sup>4</sup>; <sup>1</sup>Mines Paristech; <sup>2</sup>KIT; <sup>3</sup>ENS Cachan; <sup>4</sup>University of Southampton

**K-phase in Fe-Al-Mn-C Alloys: Morphologies and Crystallographic Aspects:** Ian Zuazo<sup>1</sup>; Helio Goldenstein<sup>2</sup>; Yves Bréchet<sup>3</sup>; Cyril Cayron<sup>4</sup>; <sup>1</sup>ArcelorMittal; <sup>2</sup>University of São Paulo; <sup>3</sup>SIMAP - Grenoble INP; <sup>4</sup>CEA-Grenoble, DRT/LITEN/DEHT/LCPEM

**Microstructural Analysis of MgB<sub>2</sub> Superconducting Wires by Electron Microscopy and X-ray Computed Tomography:** Satoshi Hata<sup>1</sup>; Yusuke Shimada<sup>1</sup>; Masatoshi Mitsuhashi<sup>1</sup>; Ken-ichi Ikeda<sup>1</sup>; Hideharu Nakashima<sup>1</sup>; Akiyoshi Matsumoto<sup>2</sup>; Kazumasa Togano<sup>2</sup>; Hiroaki Kumakura<sup>2</sup>; Hitoshi Kitaguch<sup>2</sup>; Jung Ho Kim<sup>3</sup>; Shi Xue Dou<sup>3</sup>; Jeff Gelb<sup>4</sup>; Wenbing Yun<sup>4</sup>; <sup>1</sup>Kyushu University; <sup>2</sup>National Institute for Materials Science; <sup>3</sup>University of Wollongong; <sup>4</sup>Xradia Inc.

**Microstructure Visualization and Thermal Response Analysis of IF and Peritectic Mold Slag:** Pabitra Palai<sup>1</sup>; Shainu Suresh<sup>1</sup>; T. K. Roy<sup>1</sup>; V. V. Mahashabde<sup>1</sup>; <sup>1</sup>Tata Steel Ltd., Jamshedpur, India

**Numerical Analysis and Experimental Study on Dry Friction and Wear Performance of SiC 3D Continuous Network Ceramic Reinforced Fe-40Cr Alloy:** Yu Liang<sup>1</sup>; Jiang Yanli<sup>1</sup>; Senkai Lu<sup>1</sup>; Ru Hongqiang<sup>1</sup>; Ming Fang<sup>1</sup>; <sup>1</sup>Key Laboratory of New Processing Technology for Nonferrous Metals & Materials, Ministry of Education, College of Materials Science and Engineering

**Numerical Implementations of Crystal Plasticity in the Spectral Representation:** Bogdan Mihaila<sup>1</sup>; Marko Knezevic<sup>1</sup>; Andres Cardenas<sup>2</sup>; <sup>1</sup>Los Alamos National Laboratory; <sup>2</sup>New York University

**Calculation of Lorentz Force Field of the Innovation Cathode Cell:** Jiang Yanli<sup>1</sup>; Yu Liang<sup>1</sup>; Feng Naixiang<sup>2</sup>; <sup>1</sup>Key Laboratory of New Processing Technology for Nonferrous Metals & Materials, Ministry of Education, College of Materials Science and Engineering; <sup>2</sup>School of Materials and Metallurgy, Northeastern University

**Numerical Simulations of Compression Properties of SiC/Fe-20Cr Co-continuous Composites:** Yu Liang<sup>1</sup>; Jiang Yanli<sup>1</sup>; Lu Senkai<sup>1</sup>; Ru Hongqiang<sup>1</sup>; Fang Ming<sup>1</sup>; <sup>1</sup>Key Laboratory of New Processing Technology for Nonferrous Metals & Materials, Ministry of Education, College of Materials Science and Engineering

**On Modeling Texture Evolution and Embedded Single Grain Behavior in 3D FCC Aggregates Using CPFEM:** Q. Ma<sup>1</sup>; E.B. Marin<sup>1</sup>; P.T. Wang<sup>1</sup>; <sup>1</sup>Mississippi State University

**On the Use of Realistic Microstructures to Model 3D Grain Evolution of Magnesium Alloy AZ61 via CPFEM:** Yuxiong Mao<sup>1</sup>; Quancang Ma<sup>1</sup>; Paul Wang<sup>1</sup>; Esteban Marin<sup>1</sup>; Upadesh Acharya<sup>1</sup>; <sup>1</sup>Mississippi State University

**Parallel Potts Model for Recrystallization and Sintering:** Sukbin Lee<sup>1</sup>; Anthony Rollett<sup>1</sup>; <sup>1</sup>Carnegie Mellon University

**State-of-the-art in Finite Element Modeling of Microstructural Descriptors:** Veera Sundararaghavan<sup>1</sup>; Shang Sun<sup>1</sup>; Abhishek Kumar<sup>1</sup>; <sup>1</sup>University of Michigan

**Stress Relaxation in Polycrystals - Insights from Full-field Crystal Plasticity Fast Fourier Transform Approach:** Anand Kanjarla<sup>1</sup>; Laurent Delannay<sup>2</sup>; Ricardo Lebensohn<sup>1</sup>; Huamiao wang<sup>3</sup>; Carlos Tomé<sup>1</sup>; <sup>1</sup>Los Alamos National Laboratory; <sup>2</sup>Université Catholique de Louvain, Belgium; <sup>3</sup>McMaster University

**Structure-property Relationships in Screening of Databases of Nanoporous Materials:** Maciej Haranczyk<sup>1</sup>; Richard Martin<sup>1</sup>; <sup>1</sup>Lawrence Berkeley National Laboratory

**The Granular Bainite Formation Mechanism of Medium-Carbon Si-Mn-Mo Steel:** Xian Zhang<sup>1</sup>; <sup>1</sup>Naval Surface Warfare Center

**Three-Dimensional Simulation of Rechargeable Lithium-Ion Battery Microstructures:** R. Edwin Garcia<sup>1</sup>; <sup>1</sup>Purdue University

**Towards a Taylor-type Crystal Plasticity Model in the Spectral Representation for Low-symmetry Metals:** Marko Knezevic<sup>1</sup>; Rodney McCabe<sup>1</sup>; Bogdan Mihaila<sup>1</sup>; <sup>1</sup>Materials Science and Technology Division, Los Alamos National Laboratory

**An Understanding of Embrittlement in Structural Materials Using 3D/4D Characterisation Methods:** Chiradeep Gupta<sup>1</sup>; Hiroyuki Toda<sup>1</sup>; Masakazu Kobayashi<sup>1</sup>; Christian Schlacher<sup>2</sup>; Christof Sommitsch<sup>2</sup>; Peter Mayr<sup>3</sup>; Yoshio Suzuki<sup>4</sup>; Kentaro Useugi<sup>4</sup>; Akihisa Takeuchi<sup>4</sup>; Darren Leclere<sup>1</sup>; <sup>1</sup>Toyohashi University of Technology; <sup>2</sup>Graz University of Technology; <sup>3</sup>Chemnitz University of Technology; <sup>4</sup>Japan Synchrotron Radiation Research Institute

**A Microscale Tension Test and Subsequent Serial Sectioning of an  $\alpha+\beta$  Titanium Alloy, Ti-6Al-2Sn-4Zr-6Mo:** Christopher Szczepanski<sup>1</sup>; S.K. Jha<sup>2</sup>; R. Wheeler<sup>3</sup>; P.A. Shade<sup>1</sup>; J.M. Larsen<sup>1</sup>; <sup>1</sup>US Air Force Research Laboratory; <sup>2</sup>Universal Technology Corporation; <sup>3</sup>UES, Inc.

**Multi-scale Tomographic Analysis of Ductile Fracture in Ultrahigh Strength Steels:** Stephanie Chan<sup>1</sup>; Dave Rowenhorst<sup>2</sup>; George Spanos<sup>3</sup>; Erik Lauridsen<sup>4</sup>; Wolfgang Ludwig<sup>5</sup>; Greg Olson<sup>6</sup>; <sup>1</sup>NextGen Aeronautics, Inc. ; <sup>2</sup>Naval Research Laboratory; <sup>3</sup>Currently The Minerals, Metals, and Materials Society; <sup>4</sup>Risø National Laboratory; <sup>5</sup>Laboratoire MATEIS; <sup>6</sup>Northwestern University



**Session 4: Image Processing of 2D and 3D Microstructural Data**  
Room: Exhibit Hall

6:30 PM	<b>Invited: Shape Analysis and Classification of Objects:</b> Brent Neal <sup>1</sup> ; John Russ <sup>2</sup> ; <sup>1</sup> Milliken & Company; <sup>2</sup> North Carolina State University
7:00 PM	<b>Invited: Graph Cut Approaches for Materials Segmentation Preserving Shape, Appearance, and Topology:</b> Jarrell Waggoner <sup>1</sup> ; Jeff Simmons <sup>2</sup> ; Marc De Graef <sup>3</sup> ; Song Wang <sup>1</sup> ; <sup>1</sup> University of South Carolina; <sup>2</sup> Materials and Manufacturing Directorate, Air Force Research Labs; <sup>3</sup> Carnegie Mellon University
7:30 PM	<b>Question and Answer Period</b>
7:45 PM	<b>Simulation of FIB-SEM Images for Segmentation of Porous Microstructures:</b> Torben Prill <sup>1</sup> ; Katja Schladitz <sup>1</sup> ; Christian Wieser <sup>2</sup> ; <sup>1</sup> Fraunhofer ITWM; <sup>2</sup> Adam Opel AG
8:05 PM	<b>A New Filtering Strategy for Noise Reduction on High Noise 3D Data Sets:</b> Steven Van Boxel <sup>1</sup> ; Nghia Vo <sup>2</sup> ; Peter Lee <sup>1</sup> ; Philip Withers <sup>1</sup> ; <sup>1</sup> University of Manchester; <sup>2</sup> Singapore Synchrotron Light Source
8:25 PM	<b>Break</b>
8:45 PM	<b>Microstructural Characterization of Porous Shape Memory Alloys using X-ray Tomography:</b> David Rowenhorst <sup>1</sup> ; Catherine Tupper <sup>2</sup> ; David Dunand <sup>2</sup> ; <sup>1</sup> Naval Research Lab; <sup>2</sup> Northwestern University
9:05 PM	<b>Model Based HAADF STEM Tomography:</b> Singanallur Venkatakrisnan <sup>1</sup> ; Lawrence Drummy <sup>2</sup> ; Michael Jackson <sup>3</sup> ; Marc Graef <sup>4</sup> ; Charles Bouman <sup>1</sup> ; Jeff Simmons <sup>2</sup> ; <sup>1</sup> Purdue University; <sup>2</sup> AFRL; <sup>3</sup> BlueQuartz Software; <sup>4</sup> Carnegie Mellon University
9:25 PM	<b>Energy-based Segmentation Methods for Micrograph Analysis:</b> Gunay Dogan <sup>1</sup> ; Stephen Langer <sup>2</sup> ; Andrew Reid <sup>2</sup> ; <sup>1</sup> Theiss Research; <sup>2</sup> National Institute of Standards and Technology
9:45 PM	<b>Generalized Forward Projectors for the Iterative Reconstruction of Electron Beam Serial Sectioning Data Sets:</b> Marc De Graef <sup>1</sup> ; <sup>1</sup> Carnegie Mellon University

**Tuesday, July 10, 2012**

**Session 5: Microstructure-Property Relationships in 3D**  
Room: Exhibit Hall

8:15 AM	<b>Invited: 4D Materials Science: In Situ X-ray Synchrotron Tomography of Deformation in Metallic Materials:</b> Nikhilesh Chawla <sup>1</sup> ; <sup>1</sup> Arizona State University
8:45 AM	<b>Invited: Combining X-ray Microtomography with Full Field Finite Elements Method to Study 3D Cracking in Structural Materials:</b> Henry Proudhon <sup>1</sup> ; Jia Li <sup>1</sup> ; Vincent Chiaruttini <sup>2</sup> ; Thilo Morgeneyer <sup>1</sup> ; Lucien Laiarinandrasana <sup>1</sup> ; Samuel Forest <sup>1</sup> ; Jean-Yves Buffière <sup>3</sup> ; Wolfgang Ludwig <sup>3</sup> ; <sup>1</sup> MINES ParisTech; <sup>2</sup> ONERA; <sup>3</sup> Université de Lyon
9:15 AM	<b>Question and Answer Period</b>
9:30 AM	<b>Break</b>

**Session 6: Microstructure-Property Relationships in 3D: Fatigue, Failure and Deformation**  
Room: Exhibit Hall

9:45 AM	<b>3D Characterization and Modeling of Fatigue Cracks:</b> Anthony Rollett <sup>1</sup> ; Clayton Stein <sup>1</sup> ; Reeru Pokharel <sup>1</sup> ; Jonathan Lind <sup>1</sup> ; Joseph Tucker <sup>1</sup> ; Albert Cerrone <sup>1</sup> ; Anthony Ingraffea <sup>1</sup> ; Robert Suter <sup>1</sup> ; Peter Kenesei <sup>2</sup> ; Ulrich Lienert <sup>2</sup> ; <sup>1</sup> Carnegie Mellon University; <sup>2</sup> Advanced Photon Source (APS)
10:05 AM	<b>3D Visualization of Creep-Fatigue Crack Morphology in Alloy 617 using FIB Serial Sectioning:</b> Rachael Madland <sup>1</sup> ; Laura Carroll <sup>2</sup> ; David Diercks <sup>1</sup> ; Brian Gorman <sup>1</sup> ; <sup>1</sup> Colorado School of Mines; <sup>2</sup> Idaho National Laboratory

10:25 AM	<b>3D Characterization and Modeling of the Influence of Porosity on Fatigue Properties of a Cast Al Alloy:</b> Jean-Yves Buffiere <sup>1</sup> ; Eric Maire <sup>2</sup> ; Nicolas Vanderesse <sup>3</sup> ; <sup>1</sup> Universite de Lyon INSA LYON ; <sup>2</sup> Universite de Lyon INSA LYON; <sup>3</sup> Ecole de Technologie Supérieure
10:45 AM	<b>In-situ Measurement of Lattice Strain in Al-Li Alloys:</b> Armand Beaudoin <sup>1</sup> ; Mark Obstalecki <sup>2</sup> ; Wesley Tayon <sup>3</sup> ; Ulrich Lienert <sup>4</sup> ; Peter Kenesei <sup>4</sup> ; <sup>1</sup> University of Illinois at Urbana-Champaign; <sup>2</sup> Cornell University; <sup>3</sup> NASA; <sup>4</sup> Argonne National Laboratory
11:05 AM	<b>Break</b>
11:20 AM	<b>Numerical Simulation and Experimental Analysis of Notched Failure Processes in Composite Laminates:</b> Ian Sinclair <sup>1</sup> ; Qingda Yang <sup>2</sup> ; Mark Mavrogordato <sup>1</sup> ; Brian Cox <sup>3</sup> ; Mark Spearing <sup>1</sup> ; <sup>1</sup> University of Southampton; <sup>2</sup> University of Miami; <sup>3</sup> Teledyne Scientific
11:40 AM	<b>3D Image-based Modeling of Residual Stresses in Hybrid Shape Memory Alloy / Ceramic Composites:</b> Brian Lester <sup>1</sup> ; Yves Chemisky <sup>1</sup> ; Dimitris Lagoudas <sup>1</sup> ; Richard Everett <sup>2</sup> ; Siddiq Qidwai <sup>2</sup> ; Andrew Geltmacher <sup>2</sup> ; <sup>1</sup> Texas A&M University; <sup>2</sup> Naval Research Laboratory
12:00 PM	<b>Integrated Experimental and Simulation Approaches for Mesoscopic Deformation of Polycrystalline Metal: Crystal Plasticity FEM:</b> Yoon Suk Choi <sup>1</sup> ; Michael Groeber <sup>2</sup> ; Paul Shade <sup>2</sup> ; Todd Turner <sup>2</sup> ; Jay Schuren <sup>2</sup> ; Michael Uchic <sup>2</sup> ; Christopher Woodward <sup>2</sup> ; Dennis Dimiduk <sup>2</sup> ; Triplicane Parthasarathy <sup>1</sup> ; <sup>1</sup> UES, Inc.; <sup>2</sup> Air Force Research Lab.

## Session 7: Microstructure-Property Relationships in 3D: Characterization and Simulation Room: Sunburst

9:45 AM	<b>Twin Connectivity in Wrought Magnesium Alloys:</b> Matthew Barnett <sup>1</sup> ; Alireza Ghaderi <sup>1</sup> ; Mark Nave <sup>1</sup> ; <sup>1</sup> Deakin University
10:05 AM	<b>The Influence of 3D Networks of Aluminides on the Strength of Al-Si Piston Alloys:</b> Guillermo Requena <sup>1</sup> ; Zahid Asghar <sup>1</sup> ; <sup>1</sup> TU Vienna
10:25 AM	<b>Measurements of Materials During In-situ Experiments Using X-ray Tomography:</b> Brian Patterson <sup>1</sup> ; Kevin Henderson <sup>1</sup> ; Robert Gilbertson <sup>1</sup> ; Christopher Hamilton <sup>1</sup> ; Kimberly Obrey <sup>1</sup> ; Nickolaus Smith <sup>1</sup> ; <sup>1</sup> Los Alamos National Laboratory
10:45 AM	<b>Development of Fully Automated Serial-Sectioning 3D Microscope and Topological Approach to Pearlite and Dual-phase Microstructure in Steels:</b> Yoshitaka Adachi <sup>1</sup> ; Naoko Sato <sup>1</sup> ; <sup>1</sup> Kagoshima University
11:05 AM	<b>Break</b>
11:20 AM	<b>Quantification of Primary Phase Undercooling of Rapidly Solidified Droplets with 3D Microtomography:</b> Arash Ilbagi <sup>1</sup> ; Hani Henein <sup>1</sup> ; Dieter Herlach <sup>2</sup> ; <sup>1</sup> University of Alberta; <sup>2</sup> c/o Institute of Materials Physics in Space, DLR
11:40 AM	<b>Using Combined EBSD/EDS to Characterise Nickel-Based Superalloys in 3D:</b> Geoff West <sup>1</sup> ; Rachel Thomson <sup>1</sup> ; Daniel Child <sup>1</sup> ; <sup>1</sup> Loughborough University
12:00 PM	<b>Using Computational 3D Microstructural Models to Simulate and Predict Life of Materials:</b> Ashley Clark <sup>1</sup> ; <sup>1</sup> VEXTEC Corporation

## Poster Session 2: Image Processing, Digital Representations of 3D Microstructures, and Applications of 3D Experimental Techniques Room: Exhibit Hall

4:00 – 5:30 PM

**3-D Characterization and Reconstruction of the Primary Austenite Dendrite and Interdendritic Space in Lamellar Cast Iron:** Attila Diószegi<sup>1</sup>; Ruben Lora<sup>1</sup>; Vasilios Fourlakidis<sup>2</sup>; Guillem Prats Vilaseca<sup>1</sup>; Álvaro Díaz de Aguilar<sup>1</sup>; <sup>1</sup>Jönköping University; <sup>2</sup>Swerea Swecast AB

**3D Characterization of Damage within Copper Using Micro and Nano X-ray Tomography:** Brian Patterson<sup>1</sup>; Kevin Henderson<sup>1</sup>; Ellen Cerreta<sup>1</sup>; J Escobedo-Diaz<sup>1</sup>; Darcie Dennis-Koller<sup>1</sup>; <sup>1</sup>Los Alamos National Laboratory

**3D Characterization of High Burn-up MOX Fuel:** Melissa Teague<sup>1</sup>; Jessica Riesterer<sup>1</sup>; Brian Gorman<sup>1</sup>; Michael Tonks<sup>1</sup>; <sup>1</sup>Idaho National Laboratory

**3D Identification of Inclusions in NiTi Alloy after Electropolishing:** Tadeusz Hryniewicz<sup>1</sup>; Ryszard Rokicki<sup>1</sup>; <sup>1</sup>Politechnika Koszalin

**Advances in 3D Imaging and Analysis of Materials Using Electron and Ion Beams:** Hans Fleurkens<sup>1</sup>; Daniel Phifer<sup>1</sup>; <sup>1</sup>FEI Company

**Automated Segmentation and Characterization of 2D/3D Fibrous Composite Optical Micrographs Using the Hough Transform:** Craig Przybyla<sup>1</sup>; <sup>1</sup>Air Force Research Laboratory

**Converting between 2-D and 3-D Grain Size Measurements:** Kristina Lord<sup>1</sup>; Alexander King<sup>1</sup>; <sup>1</sup>The Ames Laboratory

**Development of a Data Fusion Module to Register and Combine EBSD, EDS, and Electron-Optic Images:** Megna Shah<sup>1</sup>; Michael Uchio<sup>2</sup>; Michael Groeber<sup>2</sup>; <sup>1</sup>UES, Inc.; <sup>2</sup>Air Force Research Laboratory

**Digital Representation Environment for the Analysis of Microstructure in 3D (DREAM.3D):** Michael Groeber<sup>1</sup>; Michael Jackson<sup>2</sup>; <sup>1</sup>AFRL; <sup>2</sup>BlueQuartz Software

**FIB/SEM Tomography as a Tool to Study Bulk Membrane Recycling in Central Synapses:** Liubov Belova<sup>1</sup>; Oleg Shupliakov<sup>2</sup>; <sup>1</sup>KTH, Royal Institute of Technology; <sup>2</sup>Karolinska Institute

**3D Analysis of Phase Separation in Ferritic Stainless Steels:** Joakim Odqvist<sup>1</sup>; Jing Zhou<sup>1</sup>; Wei Xiong<sup>1</sup>; Peter Hedström<sup>1</sup>; Mattias Thuvander<sup>2</sup>; Malin Selleby<sup>1</sup>; John Ågren<sup>1</sup>; <sup>1</sup>KTH (Royal Institute of Technology); <sup>2</sup>Chalmers University of Technology

**Generation of Micro-Architectures:** Philippe Young<sup>1</sup>; David Raymont<sup>1</sup>; Liang Hao<sup>1</sup>; Kerim Genc<sup>2</sup>; <sup>1</sup>University of Exeter; <sup>2</sup>Simpleware Ltd.

**Handling Misalignment and Drift in 3D EBSD Data Sets:** Andrew Deal<sup>1</sup>; Yuchi Huang<sup>1</sup>; Brandon Laflen<sup>1</sup>; Ian Spinelli<sup>1</sup>; Anthony Barbuto<sup>1</sup>; Timothy Hanlon<sup>1</sup>; <sup>1</sup>GE Global Research

**High Energy Diffraction Microscopy as a Tool for High Pressure Research:** Joel Bernier<sup>1</sup>; Nathan Barton<sup>1</sup>; Donald Boyce<sup>2</sup>; Daniel Farber<sup>3</sup>; <sup>1</sup>Lawrence Livermore National Laboratory, Engineering Technologies Division; <sup>2</sup>Cornell University, Sibley School of Mechanical and Aerospace Engineering; <sup>3</sup>Lawrence Livermore National Laboratory, Condensed Matter and Materials Division

**In-situ Investigations of the Interface Dynamics of Materials using Ultra-fast X-ray Tomographic Microscopy and Laser Heating:** Julie Fife<sup>1</sup>; Peter Voorhees<sup>2</sup>; Marco Stamparoni<sup>3</sup>; <sup>1</sup>Paul Scherrer Institut; <sup>2</sup>Northwestern University; <sup>3</sup>Paul Scherrer Institut and ETH and University of Zurich

**In situ Tomographic Imaging of 3D Microporous Composite Anode of Lithium-ion Batteries:** Xianghui Xiao<sup>1</sup>; Fikile Brushett<sup>1</sup>; Lynn Trahey<sup>1</sup>; John Vaughey<sup>1</sup>; <sup>1</sup>Argonne National Laboratory

**Optimizing Scholastic Process for Efficient Microstructure Reconstruction:** Seun Ryu<sup>1</sup>; Dongsheng Li<sup>1</sup>; <sup>1</sup>Pacific Northwest National Laboratory

**Investigating Shock Damage in Polycrystalline Cu through High-Energy Diffraction Microscopy:** John Bingert<sup>1</sup>; R.M. Suter<sup>2</sup>; J. Lind<sup>2</sup>; S.F. Li<sup>2</sup>; C.M. Hefferan<sup>2</sup>; C.P. Trujillo<sup>1</sup>; <sup>1</sup>Los Alamos National Laboratory; <sup>2</sup>Carnegie Mellon University

**Investigation of the 3D Grain Size and Shape of WC in Cemented Carbides:** Ali Gholinia<sup>1</sup>; Bartłomiej Winiarski<sup>1</sup>; Philip J. Withers<sup>1</sup>; Ida Borgh<sup>2</sup>; Peter Hedström<sup>2</sup>; Joakim Odqvist<sup>2</sup>; Annika Borgenstam<sup>2</sup>; Ken Mingard<sup>3</sup>; Mark G Gee<sup>3</sup>; <sup>1</sup>University of Manchester; <sup>2</sup>KTH Royal Institute of Technology; <sup>3</sup>National Physical Laboratory

**Measurement and Quantification of Grain Boundary Evolution in Three Dimensions During Grain Coarsening:** S. F. Li<sup>1</sup>; B. W. Reed<sup>1</sup>; J. V. Bernier<sup>1</sup>; C. M. Hefferan<sup>2</sup>; J. Lind<sup>2</sup>; R. M. Suter<sup>2</sup>; M. Kumar<sup>1</sup>; <sup>1</sup>Lawrence Livermore National Lab; <sup>2</sup>Carnegie Mellon University

**Micro-Computed Tomography, a 3D Tool for Non-destructive Visualisation and Analysis:** Evi Bongaers<sup>1</sup>; Remy Van den Bosch<sup>2</sup>; <sup>1</sup>SkyScan N.V.; <sup>2</sup>University of Antwerp

**Modeling and Simulation of Constituent Particle Clustering and Distribution in Rolled Aluminum Alloys:** Matthew Cullin<sup>1</sup>; Gary Harlow<sup>2</sup>; Robert Wei<sup>2</sup>; <sup>1</sup>University of Alaska Anchorage; <sup>2</sup>Lehigh University

**Multi-Scale Homogenisation for 3D Microstructures:** Philippe Young<sup>1</sup>; David Raymont<sup>1</sup>; Liang Hao<sup>1</sup>; Kerim Genc<sup>2</sup>; <sup>1</sup>University of Exeter; <sup>2</sup>Simpleware Ltd.

**Study of Three Dimensional Microstructural Morphologies of Dendritically Solidified alpha-Mg(X):** Mingyue Wang<sup>1</sup>; Tao Jing<sup>2</sup>; <sup>1</sup>Tsinghua University & Arizona State University; <sup>2</sup>Tsinghua University

**Three Dimensional Composition Mapping of a White Spot VAR Defect in Nickel Alloy 718:** Trevor Watt<sup>1</sup>; Eric Taleff<sup>1</sup>; <sup>1</sup>The University of Texas at Austin

**Three Dimensional Segmentation and Reconstruction From Serial Micrographs of Powder Metallurgy Polycrystals:** Michael Marsh<sup>1</sup>; Laurent Bernard<sup>2</sup>; Murali Gorantla<sup>3</sup>; Yoon Suk Choi<sup>3</sup>; <sup>1</sup>Visualization Sciences Group; <sup>2</sup>Noesis; <sup>3</sup>UES

**Tracking Geometrical Features using Near-field High Energy X-ray Diffraction Microscopy:** S. F. Li<sup>1</sup>; J. Lind<sup>2</sup>; C. M. Hefferan<sup>2</sup>; A. D. Rollett<sup>2</sup>; R. M. Suter<sup>2</sup>; <sup>1</sup>Lawrence Livermore National Lab; <sup>2</sup>Carnegie Mellon University

**X-ray Micro-Laue Diffraction in 3D at the Canadian Light Source:** Renfei Feng<sup>1</sup>; <sup>1</sup>Canadian Light Source

**Characterization of Carbonate Rocks through X-Ray Microtomography:** Debora Pilotto<sup>1</sup>; Sérgio da Fontoura<sup>1</sup>; Sidnei Paciornik<sup>2</sup>; Marcos Henrique Mauricio<sup>1</sup>; <sup>1</sup>PUC-Rio; <sup>2</sup>PUC-Rio

**Characterization of Pores and Cracks in Underwater Welds by  $\mu$ CT and Digital Optical Microscopy:** Sidnei Paciornik<sup>1</sup>; Timo Bernthaler<sup>2</sup>; Valter dos Santos<sup>3</sup>; Mauricio Monteiro<sup>3</sup>; Marcos Henrique Mauricio<sup>3</sup>; Alexandre Bracarense<sup>4</sup>; Ezequiel Pessoa<sup>5</sup>; <sup>1</sup>PUC-Rio; <sup>2</sup>Hochschule Aalen - Technik und Wirtschaft; <sup>3</sup>PUC-Rio; <sup>4</sup>UFMG; <sup>5</sup>CEFET-MG

**Instrumentation Development for 4D Atom Probe Tomography:** Brian Gorman<sup>1</sup>; David Diercks<sup>1</sup>; Rita Kirchofer<sup>1</sup>; <sup>1</sup>Colorado School of Mines

## Session 8: Digital Representation of 3D Microstructures Room: Exhibit Hall

6:30 PM

**Invited: Storage and Sharing of Large 3D Imaging Datasets:** Richard Boardman<sup>1</sup>; Ian Sinclair<sup>1</sup>; Simon Cox<sup>1</sup>; Philippa Reed<sup>1</sup>; Kenji Takeda<sup>1</sup>; Jeremy Frey<sup>1</sup>; Graeme Earl<sup>1</sup>; <sup>1</sup>University of Southampton



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7:00 PM	<b>Invited: The State of 3D Synthetic Microstructure Generation and Its Novel Applications:</b> Michael Groeber <sup>1</sup> ; Anthony Rollett <sup>2</sup> ; Joseph Tucker <sup>2</sup> ; Michael Jackson <sup>3</sup> ; <sup>1</sup> AFRL; <sup>2</sup> Carnegie Mellon University; <sup>3</sup> BlueQuartz Software
7:30 PM	<b>Question and Answer Period</b>
7:45 PM	<b>Model Reduction and Reconstruction of Realistic Microstructures for Computing Property Variability:</b> Nicholas Zabaras <sup>1</sup> ; Bin Wen <sup>1</sup> ; <sup>1</sup> Materials Process Design and Control Laboratory
8:05 PM	<b>The OOF Project at NIST:</b> Stephen Langer <sup>1</sup> ; Andrew Reid <sup>1</sup> ; Günay Dogan <sup>2</sup> ; <sup>1</sup> National Institute of Standards and Technology; <sup>2</sup> NIST/Theiss Research
8:25 PM	<b>Break</b>
8:45 PM	<b>Modelling the Local Strut Thickness of Open Foams based on 3D Image Data:</b> André Liebscher <sup>1</sup> ; Claudia Redenbach <sup>1</sup> ; <sup>1</sup> TU Kaiserslautern
9:05 PM	<b>Fitting Laguerre Tessellations to the Microstructure of Cellular Materials:</b> Irene Vecchio <sup>1</sup> ; Katja Schladitz <sup>1</sup> ; Claudia Redenbach <sup>2</sup> ; <sup>1</sup> Fraunhofer ITWM; <sup>2</sup> University of Kaiserslautern
9:25 PM	<b>A Implicit Model for Generating Polycrystalline Structures and Unstructured Meshes:</b> LiangXing Lv <sup>1</sup> ; Liang Zhen <sup>1</sup> ; Wenzhu Shao <sup>1</sup> ; <sup>1</sup> Harbin Institute of Technology
9:45 PM	<b>Stereology and 3D Grain Boundary Network Analysis:</b> Bryan Reed <sup>1</sup> ; Brent Adams <sup>2</sup> ; Joel Bernier <sup>1</sup> ; Chris Hefferan <sup>3</sup> ; Alisa Henrie <sup>2</sup> ; Shiu Li <sup>3</sup> ; Jonathan Lind <sup>3</sup> ; Robert Suter <sup>3</sup> ; Mukul Kumar <sup>1</sup> ; <sup>1</sup> Lawrence Livermore National Laboratory; <sup>2</sup> Brigham Young University; <sup>3</sup> Carnegie Mellon University

## Wednesday, July 11, 2012

### Session 9: 3D Interfaces and Microstructural Evolution Room: Exhibit Hall

8:15 AM	<b>Invited: Diffraction-based 3D Imaging of Microstructural Evolution:</b> Erik Lauridsen <sup>1</sup> ; <sup>1</sup> Risø-DTU
8:45 AM	<b>Invited: Interfacial Morphology and Evolution in Solid-Liquid Mixtures:</b> J. Gibbs <sup>1</sup> ; J. Fife <sup>2</sup> ; Peter Voorhees <sup>1</sup> ; <sup>1</sup> Northwestern University; <sup>2</sup> Swiss Light Source
9:15 AM	<b>Invited: 3-dimensional Measurement and Description of the 5-parameter Grain and Phase Boundary Character in Steels:</b> Stefan Zaefferer <sup>1</sup> ; Peter Konijnenberg <sup>1</sup> ; <sup>1</sup> Max-Planck-Institute for Iron Research
9:45 AM	<b>Question and Answer Period</b>
10:00 AM	<b>Break</b>

### Session 10: 3D Interfaces and Microstructural Evolution: Boundaries and Grain Growth Room: Exhibit Hall

10:15 AM	<b>Quantitative Analysis of Three-Dimensional Grain Growth:</b> Trevor Keller <sup>1</sup> ; Dan Lewis <sup>1</sup> ; <sup>1</sup> Rensselaer Polytechnic Institute
10:35 AM	<b>The Shapes of a 3D Grain Growth Microstructure:</b> Emanuel Lazar <sup>1</sup> ; Jeremy Mason <sup>2</sup> ; Robert MacPherson <sup>1</sup> ; David Srolovitz <sup>3</sup> ; <sup>1</sup> Institute for Advanced Study; <sup>2</sup> Lawrence Livermore National Laboratory; <sup>3</sup> Institute of High Performance Computing, A*Star
10:55 AM	<b>Topological Mechanism of Grain Growth:</b> Burton Patterson <sup>1</sup> ; Robert DeHoff <sup>1</sup> ; Veena Tikare <sup>2</sup> ; Zhiwei Sun <sup>3</sup> ; David Rule <sup>1</sup> ; Amy Adams <sup>1</sup> ; <sup>1</sup> University of Florida; <sup>2</sup> Sandia National Laboratory; <sup>3</sup> University of Alabama at Birmingham
11:15 AM	<b>Break</b>
11:30 AM	<b>Distribution of Carbide Particles and Its Influence on Grain Growth of Ferrite in Fe-C alloys containing B and V:</b> Takafumi Oikawa <sup>1</sup> ; Masato Enomoto <sup>1</sup> ; <sup>1</sup> Ibaraki University
11:50 AM	<b>Modeling Grain Boundary Interfaces in Pure Nickel:</b> Todd Turner <sup>1</sup> ; Jay Schuren <sup>1</sup> ; Paul Shade <sup>1</sup> ; Michael Groeber <sup>1</sup> ; <sup>1</sup> Air Force Research Laboratory

12:10 PM

**3D Stochastic Ginzburg-Landau Model of Non-Classical Nucleation:** Alexander Umantsev<sup>1</sup>; <sup>1</sup>Fayetteville State University

**Session 11: 3D Interfaces and Microstructural Evolution: Structure and Morphology**  
Room: Sunburst

10:15 AM

**On the Three-dimensional Microstructure of Martensite in Carbon Steels:** Peter Hedström<sup>1</sup>; Albin Stormvinter<sup>1</sup>; Annika Borgenstam<sup>1</sup>; Ali Gholinia<sup>2</sup>; Bartłomiej Winiarski<sup>2</sup>; Philip J. Withers<sup>2</sup>; Oskar Karlsson<sup>3</sup>; Joacim Hagström<sup>3</sup>; <sup>1</sup>KTH - Royal Institute of Technology; <sup>2</sup>University of Manchester; <sup>3</sup>Swerea KIMAB AB

10:35 AM

**Morphology and Crystallography of Annealing Twins in Austenite:** Milo Kral<sup>1</sup>; Ben Gardiner<sup>1</sup>; <sup>1</sup>University of Canterbury

10:55 AM

**Three-dimensional Morphology Due to Phase Separation in an Fe-Ni-Al Alloy Studied by STEM Tomography:** Syo Matsumura<sup>1</sup>; Keisuke Ogata<sup>1</sup>; Satoshi Hata<sup>1</sup>; Minoru Doi<sup>2</sup>; Hideharu Nakashima<sup>1</sup>; <sup>1</sup>Kyushu University; <sup>2</sup>Aichi Institute of Technology

11:15 AM

**Break**

11:30 AM

**3D Characterization of Microstructural Evolution in Anisotropic Ceramics:** Melanie Syha<sup>1</sup>; Wolfgang Rheinheimer<sup>1</sup>; Michael Bäurer<sup>1</sup>; Wolfgang Ludwig<sup>2</sup>; Erik Lauridsen<sup>3</sup>; Daniel Weygand<sup>1</sup>; Peter Gumbsch<sup>1</sup>; <sup>1</sup>Karlsruhe Institute of Technology; <sup>2</sup>European Synchrotron Radiation Facility; <sup>3</sup>Risø National Laboratory

11:50 AM

**Structural Evolution of Nanoporous Gold during Thermal Coarsening as Determined by X-ray Nano-tomography:** Yu-chen Chen<sup>1</sup>; Steve Wang<sup>2</sup>; Yong Chu<sup>3</sup>; Wenjun Liu<sup>2</sup>; Ian McNulty<sup>2</sup>; Peter Voorhees<sup>4</sup>; David Dunand<sup>4</sup>; <sup>1</sup>Northwestern University, Argonne National Lab.; <sup>2</sup>Argonne National Lab.; <sup>3</sup>Brookhaven National Lab.; <sup>4</sup>Northwestern University

12:10 PM

**Exploring 3D Interfaces and Microstructural Evolution with Micro-Laue Diffraction:** Rozaliya Barabash<sup>1</sup>; Jon Tischler<sup>1</sup>; John Budai<sup>1</sup>; Wenjun Liu<sup>2</sup>; <sup>1</sup>Oak Ridge National Laboratory; <sup>2</sup>Advanced Photon Source

3:30 – 4:30 PM

**Student Poster Session**  
Room: Exhibit Hall

- 3-D Visualisation of Crystallographic Pitting:** Alice Laferrere<sup>1</sup>; Nick Parson<sup>2</sup>; Xiaorong Zhou<sup>1</sup>; George Thompson<sup>1</sup>; <sup>1</sup>The University of Manchester; <sup>2</sup>Rio Tinto Alcan
- 3D Analysis on the Effect of Creep Behavior on Phase Morphology of Duplex 2205 during the Continuous Annealing:** Heeyong Park<sup>1</sup>; Bruno De Cooman<sup>1</sup>; <sup>1</sup>GIFT, POSTECH
- 3D Atom Probe Investigation of Nanoscale Austenite Reversion at Interfaces in a Martensitic Stainless Steel:** Lei Yuan<sup>1</sup>; Dirk Ponge<sup>1</sup>; Dierk Raabe<sup>1</sup>; <sup>1</sup>Max-Planck-Institut fuer Eisenforschung
- 3D Microstructure Analysis in Macro-micro Scale:** Yeom Kyu Jung<sup>1</sup>; Seong Bum Son<sup>1</sup>; Chan Soon Kang<sup>1</sup>; Jong Soo Cho<sup>1</sup>; Jeong Tak Moon<sup>2</sup>; Heung Nam Han<sup>1</sup>; Kyu Hwan Oh<sup>1</sup>; <sup>1</sup>Seoul National University; <sup>2</sup>MK Electron
- 3D Microstructure Construction of Sintered ZrO<sub>2</sub> under Different Sintering Conditions:** Zhenbo Xia<sup>1</sup>; Kathy Lu<sup>1</sup>; <sup>1</sup>Virginia Polytechnic Institute and State University
- 3D Microstructures of Sb<sub>2</sub>Te<sub>3</sub> Precipitates in PbTe Matrix and Their Elongations with Prediction by a Weak Compatibility Condition:** Xian Chen<sup>1</sup>; Shanshan Cao<sup>2</sup>; Teruyuki Ikeda<sup>3</sup>; Jeffrey Snyder<sup>4</sup>; Dominique Schryvers<sup>5</sup>; Richard James<sup>1</sup>; <sup>1</sup>University of Minnesota; <sup>2</sup>South China University of Technology; <sup>3</sup>PRESTO; <sup>4</sup>California Institute of Technology; <sup>5</sup>University of Antwerp
- A New Technique to Analyze Thousands of Grains in 3D Using 3DXRD:** Hemant Sharma<sup>1</sup>; Richard Huizenga<sup>1</sup>; S. Erik Offerman<sup>1</sup>; <sup>1</sup>Delft University of Technology
- Bulk Three-dimensional Magnetic Domain Structure in a Slightly Misoriented (110)[001] FeSi Single Crystal:** Sunmi Shin<sup>1</sup>; Rudolf Schaefer<sup>2</sup>; B. C. De Cooman<sup>1</sup>; <sup>1</sup>Pohang University of Science and Technology; <sup>2</sup>IFW Dresden
- Calculation of Grain Boundary Character Distribution from Three Dimensional EBSD Data:** Hadi Pirgazi<sup>1</sup>; Roumen Petrov<sup>2</sup>; Leo Kestens<sup>1</sup>; <sup>1</sup>Gent University; <sup>2</sup>Delft University of Technology
- Deformation Mechanisms Studied in Commercially Pure Titanium by Combined use of X-ray Diffraction Contrast Tomography (DCT) and Scanning Micro-diffraction Procedures:** Laura Nervo<sup>1</sup>; Michael Preuss<sup>2</sup>; João Quinta da Fonseca<sup>2</sup>; Wolfgang Ludwig<sup>3</sup>; Andrew King<sup>4</sup>; <sup>1</sup>ESRF & University of Manchester; <sup>2</sup>University of Manchester; <sup>3</sup>INSA de Lyon; <sup>4</sup>ESRF
- Design of Virtual 3D Microstructures with Controlled Grain Size and Orientation Distribution:** Edgar de Araujo<sup>1</sup>; K. Verbeken<sup>1</sup>; L.A.I. Kestens<sup>1</sup>; <sup>1</sup>Gent University
- Four-Dimensional Characterization of Coarsening of Complex Microstructures via Phase-Field Method:** Chal-Lan Park<sup>1</sup>; Peter W. Voorhees<sup>2</sup>; Katsuyo Thornton<sup>1</sup>; <sup>1</sup>University of Michigan; <sup>2</sup>Northwestern University
- In situ Characterisation of Entrainment Defects in Liquid Al-Si-Mg Alloy:** Yang Yue<sup>1</sup>; William Griffiths<sup>1</sup>; Julie Fife<sup>2</sup>; Nick Green<sup>1</sup>; <sup>1</sup>University of Birmingham, UK; <sup>2</sup>Swiss Light Source, PSI

**Influence of Serial Section Thickness on the Measurement Precision of 3D Grain Volume and Surface:** Binbin Zhang<sup>1</sup>; Guoquan Liu<sup>1</sup>; <sup>1</sup>USTB

**Investigation of Creep Damage in Martensitic 9-12% Cr Steel using Synchrotron X-ray Micro-tomography:** Christian Schlacher<sup>1</sup>; Peter Mayr<sup>2</sup>; Francisca Mendez Martin<sup>3</sup>; Chiradeep Gupta<sup>4</sup>; Hiroyuki Toda<sup>4</sup>; Kentaro Uesugi<sup>5</sup>; Yoshio Suzuki<sup>5</sup>; Christof Sommitsch<sup>3</sup>; <sup>1</sup>Graz University of Technology; <sup>2</sup>Chemnitz University of Technology; <sup>3</sup>Graz University of Technology; <sup>4</sup>Toyohashi University of Technology; <sup>5</sup>Japan Synchrotron Radiation Research Institute

**Microstructure-Based Life Modeling of Ni-Based Superalloys:** Joseph Tucker<sup>1</sup>; Albert Cerrone<sup>2</sup>; Anthony Rollett<sup>1</sup>; Anthony Ingraffea<sup>2</sup>; <sup>1</sup>Carnegie Mellon University; <sup>2</sup>Cornell University

**Microstructure Change of SOFC Anode during Long Term Operation using 3D Reconstruction:** Harshil Parikh<sup>1</sup>; Arthur Heuer<sup>1</sup>; Mark De Guire<sup>1</sup>; Zhien Liu<sup>2</sup>; Richard Goetler<sup>2</sup>; <sup>1</sup>Case Western Reserve University; <sup>2</sup>Rolls-Royce Fuel Cell Systems (US) Inc.

**Modeling 3D Grain Coarsening Based on Tomography Data:** Melanie Syha<sup>1</sup>; Daniel Weygand<sup>1</sup>; Peter Gumbsch<sup>2</sup>; <sup>1</sup>Karlsruhe Institute for Technology; <sup>2</sup>Karlsruhe Institute of Technology

**Novel 3-D Characterization for the Advanced Understanding of Stereological Quantification of  $\alpha+\beta$  Titanium Alloys:** John Sosa<sup>1</sup>; Daniel Huber<sup>1</sup>; Vikas Dixit<sup>1</sup>; Peter Collins<sup>2</sup>; Hamish Fraser<sup>1</sup>; <sup>1</sup>The Ohio State University; <sup>2</sup>University of North Texas

**Pitfalls in Direct 3-D Characterization for Microstructural Quantification of  $\alpha+\beta$  Titanium Alloys:** Daniel Huber<sup>1</sup>; John Sosa<sup>1</sup>; Margaret Noble<sup>1</sup>; Vikas Dixit<sup>1</sup>; Peter Collins<sup>2</sup>; Hamish Fraser<sup>1</sup>; <sup>1</sup>The Ohio State University; <sup>2</sup>University of North Texas

**Quantifying the Effect of Spatial Resolution on the Accuracy of 3-D Feature Characterization:** Gregory Loughnane<sup>1</sup>; Ramana Grandhi<sup>1</sup>; Raghavan Srinivasan<sup>1</sup>; Michael Uchic<sup>2</sup>; Michael Groeber<sup>2</sup>; Matthew Riley<sup>3</sup>; Megna Shah<sup>4</sup>; <sup>1</sup>Wright State University; <sup>2</sup>Air Force Research Laboratory; <sup>3</sup>University of Idaho; <sup>4</sup>UES, Inc.

**Quantitative Analysis and Comparison of  $\gamma$  Precipitate Shapes in a Series of Ni-based Superalloys:** Patrick Callahan<sup>1</sup>; Marc De Graef<sup>1</sup>; <sup>1</sup>Carnegie Mellon University

**Reconstruction of  $\gamma$  Precipitate Shapes in Ni-base Superalloys by Means of 3D Zernike Functions:** Patrick Callahan<sup>1</sup>; Marc De Graef<sup>1</sup>; <sup>1</sup>Carnegie Mellon University

**Rendering of Virtual Tours of Three-Dimensional Model for Application in Higher Education:** José Cendejas<sup>1</sup>; <sup>1</sup>Universidad Tecnológica de Morelia

**Representation in 3D and Stress Response of Tin Whiskers:** Benjamin Anglin<sup>1</sup>; Pylon Sarobol<sup>2</sup>; Aaron Pedigo<sup>2</sup>; Wei-Hsun Chen<sup>2</sup>; Ricardo Lebensohn<sup>3</sup>; John Blendell<sup>2</sup>; Carol Handwerker<sup>2</sup>; Anthony Rollett<sup>1</sup>; <sup>1</sup>Carnegie Mellon University; <sup>2</sup>Purdue University; <sup>3</sup>Los Alamos National Laboratory

**SEM-Based Electron Tomography of Turfs Comprised of Lineal Structures:** Osama Fakron<sup>1</sup>; D.P. Field<sup>1</sup>; <sup>1</sup>WSU

**The Microstructure of RR1000 Nickel-Base Superalloy: The FIB-SEM Dual-Beam Approach:** Stephen Croxall<sup>1</sup>; Mark Hardy<sup>2</sup>; Howard Stone<sup>1</sup>; Paul Midgley<sup>1</sup>; <sup>1</sup>University of Cambridge; <sup>2</sup>Rolls Royce plc

**The Time Evolution of Three Grains in a Thin Film:** Vadim Derkach<sup>1</sup>; Amy Novick-Cohen<sup>1</sup>; Arcady Vilenkin<sup>2</sup>; <sup>1</sup>Technion-IIT; <sup>2</sup>Hebrew University

**The TriBeam System: Femtosecond Laser Based Serial Sectioning:** McLean Echlin<sup>1</sup>; Alessandro Mottura<sup>1</sup>; Tresa Pollock<sup>1</sup>; <sup>1</sup>UC Santa Barbara

**Three-dimensional Atomic and Defect Structures of Ultra Thin Au and Au-alloy Nanowires:** Chun-Hsien Wu<sup>1</sup>; Niven Monsegue<sup>1</sup>; William Reynolds<sup>1</sup>; Deborah Aruguete<sup>2</sup>; Michael Hochella<sup>1</sup>; Xin Jin<sup>1</sup>; Ge Wang<sup>1</sup>; Mitsuhiro Murayama<sup>1</sup>; <sup>1</sup>Virginia Tech; <sup>2</sup>National Science Foundation

**Three-dimensional Investigation of Void Growth Leading to Fracture in Commercially Pure Titanium:** Marina Pushkareva<sup>1</sup>; Jérôme Adrien<sup>2</sup>; Eric Maire<sup>2</sup>; Arnaud Weck<sup>1</sup>; <sup>1</sup>University of Ottawa; <sup>2</sup>INSA de Lyon

**Three Dimensional Simulation of Dendritic Solidification by Lattice Boltzmann and Cellular Automaton Methods:** Mohsen Eshraghi<sup>1</sup>; Sergio Felicelli<sup>1</sup>; <sup>1</sup>Mississippi State University

**Subgrain Boundary Identification in 3D EBSD Data through Fast Multiscale Clustering:** Brian Soe<sup>1</sup>; Cullen McMahon<sup>1</sup>; David Golay<sup>1</sup>; Zakaria Quadir<sup>2</sup>; Michael Ferry<sup>2</sup>; Lori Bassman<sup>1</sup>; <sup>1</sup>Harvey Mudd College; <sup>2</sup>University of New South Wales

## Session 12: Applications of 3D Experimental Techniques Across Length Scales: Non-Destructive Techniques Room: Exhibit Hall

6:30 PM	<b>Invited: Ultra Fast Tomography: New Developments for 4D Studies in Material Science:</b> Pierre Lhuissier <sup>1</sup> ; Mario Scheel <sup>2</sup> ; Marco Di Michiel <sup>2</sup> ; Elodie Boller <sup>2</sup> ; Jérôme Adrien <sup>3</sup> ; Eric Maire <sup>3</sup> ; Luc Salvo <sup>1</sup> ; Jean-Jacques Blandin <sup>1</sup> ; Michel Suery <sup>1</sup> ; <sup>1</sup> SIMaP/GPM2-CNRS-Grenoble University; <sup>2</sup> ESRF; <sup>3</sup> MATEIS - INSA Lyon
7:00 PM	<b>Invited: High Energy X-ray Diffraction Microscopy Microstructure Mapping:</b> Robert Suter <sup>1</sup> ; Shiu Fai Li <sup>2</sup> ; Christopher Hefferan <sup>1</sup> ; Jonathan Lind <sup>1</sup> ; Reeju Pokharel <sup>1</sup> ; Ulrich Lienert <sup>3</sup> ; Anthony Rollett <sup>1</sup> ; <sup>1</sup> Carnegie Mellon University; <sup>2</sup> Lawrence Livermore National Laboratory; <sup>3</sup> Argonne National Laboratory
7:30 PM	<b>Question and Answer Period</b>
7:45 PM	<b>High-speed Micro Imaging with Polychromatic Hard X-ray Synchrotron Radiation for Academic and Industrial Applications:</b> Elodie Boller <sup>1</sup> ; Paul Tafforeau <sup>1</sup> ; Alexander Rack <sup>1</sup> ; Carmen Soriano <sup>1</sup> ; Sophie Sanchez <sup>1</sup> ; <sup>1</sup> ESRF

8:05 PM	<b>X-ray Dark Field Microscopy:</b> Henning Poulsen <sup>1</sup> ; Andrew King <sup>2</sup> ; Wolfgang Ludwig <sup>2</sup> ; Anatoly Snigirev <sup>2</sup> ; <sup>1</sup> Risoe DTU; <sup>2</sup> ESRF
8:25 PM	<b>Break</b>
8:40 PM	<b>Characterization of Orientation and Elastic Strain Gradients Inside Bulk Grains by Means of X-ray Diffraction Imaging Techniques:</b> Wolfgang Ludwig <sup>1</sup> ; Andrew King <sup>2</sup> ; Peter Reischig <sup>2</sup> ; Nicola Vigano <sup>1</sup> ; Laura Nervo <sup>2</sup> ; <sup>1</sup> Université de Lyon; <sup>2</sup> ESRF
9:00 PM	<b>Diffraction-Amalgamated Grain-Boundary Tracking (DAGT) Technique Applied to Al-3mass%Cu:</b> Darren LeClere <sup>1</sup> ; Takano Kamiko <sup>1</sup> ; Masakazu Kobayashi <sup>1</sup> ; Kentaro Uesugi <sup>2</sup> ; Akihisa Takeuchi <sup>2</sup> ; Yoshio Suzuki <sup>2</sup> ; Hiroyuki Toda <sup>1</sup> ; <sup>1</sup> Toyohashi University of Technology; <sup>2</sup> Japan Synchrotron Radiation Research Institute
9:20 PM	<b>X-ray Tomographic Microscopy at TOMCAT: Resolving the Dynamics of Materials:</b> Julie Fife <sup>1</sup> ; Rajmund Mokso <sup>1</sup> ; Michel Rappaz <sup>2</sup> ; Marco Stampanoni <sup>3</sup> ; <sup>1</sup> Paul Scherrer Institut; <sup>2</sup> Ecole Polytechnique Fédérale de Lausanne; <sup>3</sup> Paul Scherrer Institut and ETH and University of Zurich

**Thursday, July 12, 2012**

**Session 13: Future Directions in 3D Materials Science  
Room: Exhibit Hall**

8:15 AM	<b>Invited: Exploiting Advances in Microscopy for Direct 3-D Characterization of Materials:</b> Hamish Fraser <sup>1</sup> ; Daniel Huber <sup>1</sup> ; John Sosa <sup>1</sup> ; Brian Welk <sup>1</sup> ; Robert Williams <sup>1</sup> ; Peter Collins <sup>2</sup> ; <sup>1</sup> The Ohio State University; <sup>2</sup> University of North Texas
8:45 AM	<b>Invited: The Five Parameter Grain Boundary Character Distribution of a TWIP Steel Determined from Three-dimensional Data Sets:</b> Hossein Beladi <sup>1</sup> ; Gregory Rohrer <sup>2</sup> ; <sup>1</sup> Deakin University; <sup>2</sup> Carnegie Mellon University
9:15 AM	<b>Invited: A Workshop to Promote the use of High-energy X-ray Diffraction Experiments and Detailed Computational Analyses for Understanding Multiscale Phenomena in Crystalline Materials:</b> Matthew Miller <sup>1</sup> ; Robert Suter <sup>2</sup> ; Ulrich Lienert <sup>3</sup> ; Armand Beaudoin <sup>4</sup> ; <sup>1</sup> Cornell University; <sup>2</sup> Carnegie Mellon University; <sup>3</sup> Argonne National Laboratory; <sup>4</sup> University of Illinois at Urbana Champaign
9:45 AM	<b>Break</b>
10:00 AM	<b>Invited: Future Directions for 3D Imaging in the (S)TEM:</b> Paul Midgley <sup>1</sup> ; <sup>1</sup> University of Cambridge
10:30 AM	<b>Invited: 3D Materials by Design: From Genome to Flight:</b> Greg Olson <sup>1</sup> ; <sup>1</sup> Northwestern University
11:00 AM	<b>Invited: The Critical Role of Digital 3-D Structure in Advanced Materials Research and Development:</b> Julie Christodoulou <sup>1</sup> ; <sup>1</sup> Office of Naval Research
11:30 AM	<b>Panel Discussion</b>



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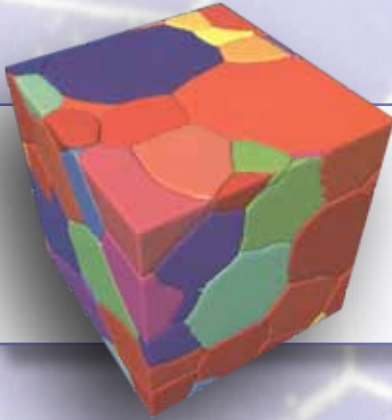
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