

## “Structural Materials Under Extreme Conditions” MaRIE Workshop

Materials Science Laboratory (MSL)  
July 29 – July 31, 2009

### Wednesday, July 29<sup>th</sup>

7:15 – 8:20 Badging, Badge Office, TA-3, Bldg. 0261 Sheila Girard

#### *AM Session: Materials Needs - Specific Applications – Chair: Dave Teter*

8:30 – 8:40 Welcome/Announcements Dave Teter  
LANL

8:40 – 9:10 MaRIE Overview John Sarrao  
LANL

9:10 – 9:40 “Integrated Computational Materials Engineering:  
A new and essential capability for surviving  
extreme environments in the automotive industry” John Allison  
Ford

9:40 – 9:50 Break

9:50 – 10:20 “Structural Materials Challenges in  
Nuclear Energy Systems” Steve Zinkle  
ORNL

10:20 – 10:50 “Aerospace Materials” Jim Williams  
Ohio State U

10:50 – 11:20 “Materials Challenges in Oil and Gas  
Industry” Greg Kusinski  
Jim Skogsberg  
Chevron

11:20 – 12:00 Discussion

12:00 – 1:30 Lunch (on your own)

***PM Session: Materials Modeling – Chair: Carlos Tome***

1:30 – 1:40	Session Introductions/Announcements	Carlos Tome LANL
1:40 – 2:15	“Modeling and Experimental Characterization of Local Features (stress, strain, microstructure)”	Carlos Tome LANL
2:15 – 2:50	“Interrogating Grain Scale Deformation within a Polycrystalline Alloy using New Micromechanical Testing Techniques and Crystal-Based Elastic Plastic Material Models”	Matthew Miller Paul Dawson Cornell U
2:50 – 3:05	Break	
3:05 – 3:40	“Multiscale Modeling of Deformation in Metals Under Extreme Conditions”	Hussein Zbib U Washington
3:40 – 4:15	“Phase Field Modeling of Coupled Displacive-Diffusional Processes”	Yunzhi Wang Ohio State U
4:15 – 5:15	Discussion	
5:15	Adjourn	
6:30	Informal Dinner	

**Thursday, July 30<sup>th</sup>**

***AM Session: Materials Processing – Chair: Deniece Korzekwa***

8:15 – 8:30	Session Introduction/Announcements	Deniece Korzekwa LANL
8:30 – 9:05	“Solidification Modeling and Experiments - What we think we know and what we need.”	Deniece Korzekwa LANL

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9:05 – 9:40	“Role of Joining Science in Developing Hybrid Structural Materials”	Suresh Babu Ohio State U
9:40 – 9:55	Break	
9:55 – 10:30	“Radiation Effects on Metal/Oxide Interfaces”	Darryl Butt Boise State U
10:30 – 11:05	“Exploiting the Power of Powder Synthesis Reactions for Advanced Structural Materials”	Iver Anderson Ames Lab
11:05 – 12:00	Discussion	
12:00 – 1:30	Lunch (on your own)	
<b><i>PM Session: Characterization – Chair: Bob Field</i></b>		
1:30 – 1:40	Session Introduction/Announcements	Bob Field LANL
1:40 – 2:10	“In Situ Neutron Diffraction Techniques”	Sven Vogel LANL
2:10 – 2:40	“Characterization of Phase Transformations in Structural Materials Under Extreme Conditions”	Mike Kaufman Colo. Sch. Of Mines
2:40 – 3:10	“3D Microstructural Characterization and Analysis”	Andy Geltmacher Naval Res. Lab.
3:10 – 3:25	Break	
3:25 – 3:55	“High Energy X-ray Diffraction Microscopy: Access to Volumetric Microstructure Responses”	Robert Suter Carnegie-Mellon U
3:55 – 4:25	“In-situ 3D X-ray Techniques”	Erik Lauridsen RISO
4:25 – 5:30	Discussion	
5:30	Adjourn	

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## Friday, July 31<sup>st</sup>

### *AM Session: Specific Properties/Materials Interactions – Chair: Jim Foley*

8:15 – 8:30	Session Introduction/Announcements	Jim Foley LANL
8:30 – 9:05	“Scientific Challenges Associated with Materials Degradation by Corrosion: Some Needs for Prognosis and Corrosion-Informed ICME”	John Scully U Virginia
9:05 – 9:40	“Hydrogen Embrittlement – Current Status and Future Directions”	Ian Robertson U Illinois
9:40 – 9:55	Break	
9:55 – 10:30	“Understanding the Role of Microstructure Variability on Fatigue Behavior”	Wayne Jones U Michigan
10:30 – 11:05	“High Temperature Materials: What Next?”	Tresa Pollock U Michigan
11:05 – 12:00	Discussion	
Noon	Adjournment	
PM:	Meeting of Organizers and Session Chairs	