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Title: Materials Capability Review 2011 notebook

Author(s): Wendy R. Cieslak

Intended for: Materials Capability Reveiw



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Date: 6/23/11
Jeane Strub

LA-UR-11-03701

The Materials Capability Review 2011
notebook is being archived in the
Materials Science & Technology Division
Office



Materials Capability Review

Los Alamos National Laboratory

May 31 - June 3, 2011

On the cover: Phase-field simulation of gas bubble nucleation and evolution (helium, yellow) in a polycrystalline material (uranium oxide, blue) showing nearly continuous coverage of the grain boundaries plus scattered interior sites.

Contents

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Agenda
Materials Capability Review Charter
Committee Instructions for Los Alamos
National Laboratory Capability Reviews

Materials Overview
- W.R. Cieslak
Materials for the Future
- A.J. Taylor
MaRIE, an Experimental Facility
Concept for Revolutionizing Materials
in Extreme Environments
- J.L. Sarrao

LDRD-DR Review - J. Martinez

Materials in Radiation Environments
J. Shlachter, M. Nastasi, Y. Wang
Poster Abstracts

Nuclear Energy: Actinide Focus
D. Teter, C. Stanek, A. Nelson
Poster Abstracts

Materials for Clean Energy
D. Watkins, V. Klimov, R. Borup
Poster Abstracts

LANSCE Overview
K. Schoenberg

Materials Capability Review Committee
Members

Materials Capability Review Theme
Leaders, Presenters

Wednesday

Thursday

Friday

Supplemental

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Agenda



Materials Capability Review Los Alamos National Laboratory

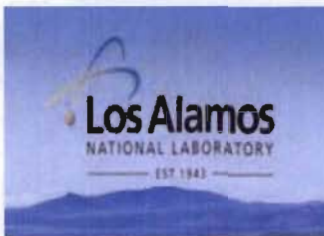
May 31-June 3, 2011

*Hilton @ Buffalo Thunder 5th Floor Executive Lounge
30 Buffalo Thunder Trail, Santa Fe, New Mexico*

Tuesday Evening, May 31, 2011 *(By Invitation Only)*

- 6:00 Opening Session – Committee Gathering and Reception
- 6:30 Director's Welcome and Committee ChargeDuncan W. McBranch
PADSTE; Deputy Principle Associate Director, Science, Technology & Engineering
- 7:00 ADEPS Welcome and Expectations.....Susan J. Seestrom
ADEPS; Associate Director, Experimental Physical Sciences
- 7:15 Executive Session *(Committee Only)*..... Gary S. Was
Committee Chair

Purpose:	Annual Capability Review	Classification Level:	Unclassified/Classified
Institutional Host(s):	Susan J. Seestrom, ADEPS, 505-665-4454	Dress:	Business/Business Casual
Technical Host(s)	Wendy R. Cieslak, MST-DO, 5-1535	Revised:	5/18/11 (jms)
Protocol POC:	Peggy S. Vigil, CGA-GAO, 7-8448 or cell 699-2195		
Catering:	ARAMARK		
LANL Update:	505-667-6622 or 1-877-723-4101: Provided information about changes in the Laboratory schedule (i.e., closings or delays) Protocol Office will adhere to all weather delays/closings.		



Agenda



Materials Capability Review

Wednesday, June 1, 2011

- 7:00 Meet visitors in lobby of the Hilton @ Buffalo Thunder Peggy S. Vigil
CGA-GAO: PADSTE, Protocol
- 7:05 Travel to LANL Badge Office, Bus leaves the hotel (*promptly @ 7:05*) LANS Taxi Service
- 7:30 Badge Office Processing Peggy S. Vigil
- 8:00 Walk to J. Robert Oppenheimer Study Center (breakfast provided for committee)

J. Robert Oppenheimer Study Center TA-3, Bldg. 207, Jemez/Cochiti Room

- 8:05 Committee Photo Robert W. Kramer
ADEPS Communications Team
- 8:20 Welcome and Logistics Susan J. Seestrom
ADEPS; Associate Director, Experimental Physical Sciences
- 8:30 Overview of the Materials Capability at Los Alamos Wendy R. Cieslak
MST-DO; Division Leader, Materials Science & Technology
- 9:15 Materials for the Future: *Towards an Implementation Plan for the Materials Strategy*
..... Antoinette (Toni) Taylor
MPA-DO; Division Leader, Materials Physics & Applications
- 9:55 MaRIE Update T. Mark McCleskey
MPA-MC; Group Leader, Materials Chemistry
- 10:25 Break
- 10:40 LDRD-DR Review: Predictive Design of Noble Metal Nanoclusters Jennifer Martinez
MPA-CINT; Scientist, Center for Integrated Nanotechnologies
- 11:40 LDRD-DR Discussion led by William Friedhorsky
LDRD-PO; Program Director, Laboratory Directed Research & Development
Including Susan Seestrom, Cathy Cleland, Wendy Cieslak, and Toni Taylor

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**J. Robert Oppenheimer Study Center
TA-3, Bldg. 207, Jemez/Cochiti Room**

- 12:00 Working Lunch with Early Career Staff and Postdocs (*By Invitation Only*)
(San Ildefonso Conference Room)
- 1:30 **Materials in Radiation Environments** Overview Jack S. Shlachter
T-DO; Deputy Division Leader, Theoretical Division
- 2:00 Center for Materials at Irradiation and Mechanical Extremes (CMIME) Michael A. Nastasi
MPA-CINT; Laboratory Fellow, Center for Integrated Nanotechnologies
- 2:30 Research Activities at the Ion Beam Materials Laboratory (IBML) Yongqiang Wang
MST-8; Scientist, Structure/Property Relations
- 3:00 Discussion and Questions Jack S. Shlachter
T-DO; Deputy Division Leader, Theoretical Division
- 3:15 Posters Presentations Various Staff
Poster Titles and Presenters: See Appendix A, Page 8
- 3:30 Poster Session
Santa Clara Gallery
- 4:30 Executive Session (*Committee Only*) Gary S. Was
Committee Chair
- 5:30 Travel to the O Eating House Restaurant (*Committee Only*) Taxi Service
86 Cities of Gold Rd., Santa Fe, NM, Phone 505-455-2000
- 6:00 Hosted working Dinner (*By Invitation Only*)
Fukushima Reactor Studies R. Dasari Venkateswara (DV Rao)
D-DO; Division Leader, Decision Applications
- 8:30 Travel to the Hilton @ Buffalo Thunder Taxi Service

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Materials Capability Review

Thursday, June 2, 2011

7:00 Meet visitors in lobby of the Hilton @ Buffalo Thunder Peggy S. Vigil
CGA-GAO: PADSTE, Protocol

7:05 Travel to LANL Study Center, Bus leaves the hotel (*promptly @ 7:05*) Taxi Service

***J. Robert Oppenheimer Study Center
TA-3, Bldg. 207, Jemez/Cochiti Room***

7:30 Voice of the Customer (*By Invitation Only*) (breakfast provided for committee)
(*San Ildefonso Conference Room*)

9:00 **Materials for Nuclear Energy (Focus on Actinides) Overview** David F. Teter
MST-DO; Deputy Division Leader, Materials Science & Technology

9:30 Lower Length Scale Simulations of Fission Gas and Thermal Transport in Oxide Nuclear
Fuel Christopher R. Stanek
MST-8; Scientist, Structure/Property Relations

10:00 Development of Experimental Techniques to Augment Theory and Simulation of
Thermal Transport in Oxide Nuclear Fuels Andrew T. Nelson
MST-7; Scientist, Polymers & Coatings

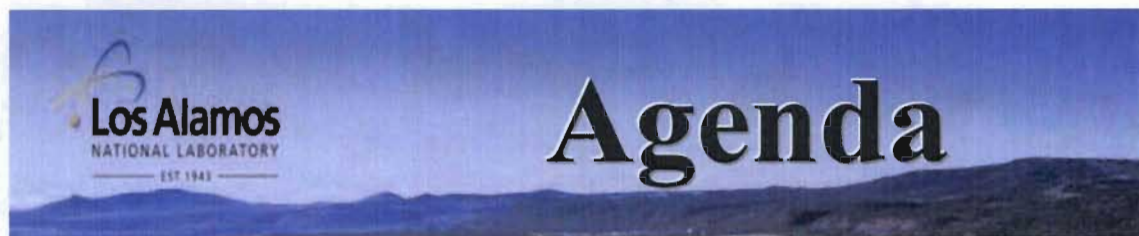
10:30 Discussion and Questions David F. Teter
MST-DO; Deputy Division Leader, Materials Science & Technology

10:45 Poster Presentation Various Staff
Poster Titles and Presenters: See Appendix B, Page 9

11:00 Poster Session
Santa Clara Gallery

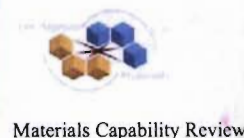
Page 4

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Protocol POC:	Peggy S. Vigil, CGA-GAO, 7-8448 or cell 699-2195	
Catering:	ARAMARK	
LANL Update:	505-667-6622 or 1-877-723-4101: Provided information about changes in the Laboratory schedule (i.e., closings or delays) Protocol Office will adhere to all weather delays/closings.	



***J. Robert Oppenheimer Study Center
TA-3, Bldg. 207, Jemez/Cochiti Room***

- 12:00 Panel Discussion and Lunch (*Committee and Panel Only*)
(*San Ildefonso Conference Room*)
The Relationship of MaRIE and LANSCE to the Material Strategy Panelists:
Wendy R. Cieslak, facilitator
Kurt F. Schoenberg
John L. Sarrao
Antoinette (Toni) Taylor
- 1:30 **Materials for Clean Energy Overview** David E. Watkins
MPA-DO; Deputy Division Leader, Materials Physics & Applications
- 2:00 Center for Advanced Solar Photophysics (CASP) Victor I. Klimov
C-PCS; Laboratory Fellow, Chemistry, Physical Chemistry & Applied Spectroscopy
- 2:30 Materials Development in the LANL Fuel Cell Program Rodney L. Borup
MPA-11; Program Manager, Sensors & Electrochemical Devices
- 3:00 Discussion and Questions..... David E. Watkins
MPA-DO; Deputy Division Leader, Materials Physics & Applications
- 3:15 Poster Presentations Various Staff
Poster Titles and Presenters: See Appendix C, Page 10
- 3:30 Poster Session
Santa Clara Gallery
- 4:30 Executive Session (*Committee Only*)
- 6:00 Travel to the Hilton @ Buffalo Thunder Taxi Service



Friday, June 3, 2011

LANSCE
TA-53, Building 1, Rosen Auditorium

- 7:30 Committee Members Arrive & Finalize Tour Access/Logistics Gary S. Was
(breakfast provided for committee) *Committee Chair*
- 7:45 LANSCE Overview Kurt F. Schoenberg
ADEPS; Deputy Associate Director, Experimental Physical Sciences and LANSCE Director
- 8:15 Travel to the Lujan Center Taxi Service
- 8:30 LANSCE Tour Begins -Lujan Center Alan J. Hurd
LANSCE-LC; Group Leader, Lujan Center
- 9:00 Travel to pRAD
- 9:10 LANSCE Tour –pRAD Alexander (Andy) Saunders
P-25; Deputy Group Leader, Subatomic Physics
- 9:40 Travel: **Cleared to Building 1**; Uncleared to Injector Building

Cleared Committee Members Split Off for Classified Session shown in red
Uncleared Committee Members Session shown in black

*SECURITY NOTICE: Electronics, including cell phones, two-way pagers, PDA's (Blackberry, Palm Pilot, etc.), laptop computers, thumb-drives, cameras, etc. are **NOT** allowed in cleared Laboratory areas. It is suggested that visitors going behind the security fence leave all personal belongings in vehicles or hotel rooms or they will be subject to a complete search to include coats, briefcases, etc.*

- 9:50 *Location: TA-53-1-D143*
Classified pRAD Session Christopher Morris
P-25; Laboratory Fellow, Subatomic Physics
- 10:10 *Classified Poster Session* Various Staff
Poster Unclassified Titles and Presenters: Listed with Theme, pages 8 and 9

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Protocol POC:	Peggy S. Vigil, CGA-GAO, 7-8448 or cell 699-2195		
Catering:	ARAMARK		
LANL Update:	505-667-6622 or 1-877-723-4101: Provided information about changes in the Laboratory schedule (i.e., closings or delays) Protocol Office will adhere to all weather delays/closings.		

LANCSE Tour

- 9:50 LANSCE Tour – Injector BuildingJohn L. Erickson
AOT-DO; Division Leader, Accelerator Operations & Technology
- 10:20 Return to Building 1 Taxi Service
- 10:30 Committee Rejoins for Executive Session in A234 (*Committee Only*)Gary S. Was
Committee Chair
- 11:30 Lunch (*Closed Session*) Terry C. Wallace Jr.
PADSTE; Principle Associate Director, Science, Technology & Engineering
- 12:40 Committee Members to the Rosen Auditorium

Rosen Auditorium TA-53, Building 1

- 12:45 Formal Outbrief Gary S. Was
Committee Chair
- 2:00 Committee Members Depart

APPENDIX A

MATERIALS IN RADIATION ENVIRONMENTS POSTER SESSION, Wednesday, June 1, 2011

Irradiation Environment in the Proposed Materials Test Station Eric J. Pitcher
LANSCE-DO, LANSCE

LANSCE: Nuclear Physics and Materials Science John L. Ullmann
LANSCE-NS, Neutron & Nuclear Science

The Role of Grain Boundaries in Modifying Radiation Damage Evolution in Simple Metals
..... Blas P. Uberuaga
MST-8, Structure/Property Relations

Atomistic Modeling and Experimental Studies of the Shock Response of Cu/Nb Nanolayered
Composites Ruifeng Zhang
T-3, Fluid Dynamics and Solid Mechanics

Irradiation Damage Effects in Ceramic Oxides Induced by High Temperature and High Fluence
Ion Beam Irradiation..... Igor O. Usov
MST-7, Polymers & Coatings

IBML Proton Calibration Results of the SABRS Energetic Particle Subsystems
..... Jane M. Burward-Hoy
ISR-I, Space Science & Applications

Effects of Radiation Environments on Long-Term Aging of Weapon Materials (U)
..... Jennifer A. Lillard
MST-6, Materials Technology-Metallurgy
Presented in Classified Session June 3, 2011

Advanced Materials Development and Testing for Fuel Cycle Research and Development Program
..... Osman Anderoglu
MST-8, Structure/Property Relations

Influence of Interstitials or Vacancies on Grain Boundary Sliding Processes in bcc Tungsten
..... Art F. Voter
T-1, Physics and Chemistry of Materials

APPENDIX B

MATERIALS FOR NUCLEAR ENERGY (FOCUS ON ACTINIDES) POSTER SESSION, Thursday, June 2, 2011

Sintering of Mixed-Oxide Fuel Pellets Jeremy N. Mitchell
MST-16; Nuclear Materials Science

Plutonium Science and Research Strategy: Use of Special Isotopes – ²⁴²Pu Dom S. Peterson
MST-7, Polymers & Coatings

Process Modeling of Plutonium and Uranium Casting David A. Korzekwa
MST-6, Materials Technology-Metallurgy

LEU U-10Mo Research Reactor Fuel Development and Scale Up..... David E. Dombrowski
MST-6, Materials Technology-Metallurgy

Residual Stresses in Aluminum Clad Uranium-10wt%molybdenum Fuel Plates
..... Donald W. Brown
MST-8, Structure/Property Relations

Chemical Segregation of U-10Mo Fuel Foils during Simulated Bonding Cycles Using Neutron
Diffraction Sven C. Vogel
LANSCE-LC; Lujan Center

Radioparagenesis: Robust Nuclear Waste Form Design and Novel Materials Discovery
..... Boris Dorado
MST-8, Structure/Property Relations

Fissionable Scintillators for Measuring Neutron Flux Ernst I. Esch
N-1, Safeguards Science and Technology

Material Attractiveness in Nuclear Fuel Cycles (U) Charles G. Bathke
D-5, International & Nuclear Systems Engineering
Presented in Classified Session June 3, 2011



APPENDIX C

MATERIALS FOR CLEAN ENERGY POSTER SESSION, Thursday, June 2, 2011

- Colloidal Nanomaterials for Light Harvesting Applications.....Anshu Pandey
C-PCS; Physical Chemistry & Applied Spectroscopy
- Nanocrystals John T. Stewart, IV
C-PCS; Physical Chemistry & Applied Spectroscopy
- Assessment of Silicon Nanowire Architecture for PV Application Shadi Dayeh
MPA-CINT, Center for Integrated Nanotechnologies
- Controlling Electrode Morphology to Improve Fuel Cell Performance and Durability
..... Cynthia F. Welch
MST-7, Polymers & Coatings
- Nanoscale Ceramic Catalyst Support Synthesis Eric L. Brosha
MPA-11, Sensors & Electrochemical Devices
- Membrane Materials for Energy Applications Katherine A. Berchtold
MPA-MC; Materials Chemistry
- Chemical H₂ Storage Research at LANL..... Benjamin L. Davis
MPA-MC; Materials Chemistry
- Comparative Studies of Vortex Physics in Oxide, Iron-arsenide and MgB₂ Superconductors
..... Leonardo Civale
MPA-STC; Superconductivity Technology Center
- Ions to Wires: The Science of High T_c Superconducting Wires..... Terry G. Holesinger
MPA-STC; Superconductivity Technology Center

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