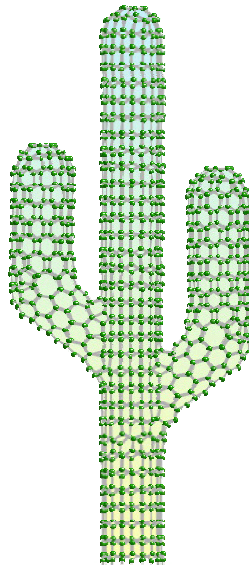


**Dynamic *in situ* electron microscopy
as a tool to meet the challenges of
the nanoword.**

January 3-6, 2006
Tempe, Arizona



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Arizona State University
Center for Solid State Science



Arizona State University
Department of Physics and Astronomy

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PROGRAM

Tuesday, January 3, 2006

Katchina Ballroom Sections 1-3

- 7:30 Registration/Breakfast/Tentative Small Group Assignments
- 8.45 Welcome – Renu Sharma
- 9.00 Welcome - Glenn Schrader, National Science Foundation

Mostly Liquid Related

- 9.15 *Real time observations of liquid phase growth processes*
F. M. Ross, IBM T. J. Watson Research Center, Yorktown Heights, New York, USA
- 9.40 *Shape equilibration, melting and motion of Pb inclusions in Al*
U. Dahmen, T. Radetic, L.H. Zhang and E. Johnson*
National Center for Electron Microscopy, LBNL, Berkeley, USA and
* Ørsted Laboratory, Niels Bohr Institute, University of Copenhagen, Denmark
- 10.05 *In situ melting of nanoembedded metals and alloys: Problems and prospects*
K.Chattopadhyay
Department of Metallurgy, Indian Institute of Science, Bangalore 560 012
- 10.30 **Break - Katchina Ballroom**

Mostly Strain/Deformation

- 10:50 *Advances in understanding of fundamental phenomena in low dimensional semiconductor structures by in-situ TEM*
Robert Hull, University of Virginia, Charlottesville USA
- 11:15 *FIB and TEM for in situ analysis*
Robert Sinclair, Department of Materials Science and Engineering, Stanford University, Stanford, California 94305-2205, USA
- 11:40 *Correlating dislocation behavior with macroscopic mechanical properties directly in the TEM through use of a novel tensile test device*
Ian Robertson, Taher Saif, Khalid Hattar and J. Han
Department of Materials Science and Engineering,
University of Illinois at Urbana-Champaign

12:05 *Quantitative in-situ nanoindentation in the TEM*
Eric A. Stach,¹ A.M. Minor,² Z. Shan,² S.A. Syed Asif,³ E. Cyrankowski,³ T.J.
Wyrobek,³ and O.L. Warren³
¹School of Materials Engineering, Purdue University, West Lafayette, IN 47906
²National Center for Electron Microscopy, Lawrence Berkeley National
Laboratory, Berkeley, CA 94720
³Hysitron Incorporated, Minneapolis, MN, 55344

12:30 **Lunch - Top of the Rock**

Katchina Ballroom Sections 1-3

1:40 Description of Group Process

1:55 Short Presentations of Future Needs/Burning Issues/Outstanding Problems
and Identification of 3 -4 Topic Areas

3:30 Formation of Small Working Groups, Appointment of Group Leader,
Directions to Small Group Rooms

3:40 **Break – Poolside**

Small Group Rooms

4.00 First Brainstorming Session of Working Groups

Katchina Ballroom Sections 1-3

5:30 Wrap-up Session

6.00 Finish

Wednesday, January 4, 2006
Katchina Ballroom Sections 1-3

7:30 **Breakfast**

Catalysts - In Memory of Leroy Eyring

8:30 *In-situ TEM for studies of morphological changes in emission control catalysts during operation*

C. Wang¹; J.H. Kwak¹; D.H. Kim¹; J. Szanyi¹; R. Sharma²; S. Thevuthasan¹; C.H.F. Peden¹

¹ Institute for Interfacial Catalysis and Environmental Molecular Sciences Laboratory, Pacific Northwest National Laboratory, Richland, WA, USA.

² Center for Solid State Science, Arizona State University, Tempe, AZ, USA.

8:55 *Dynamics and mobility of nanoparticles in heterogeneous catalysts*

Abhaya K. Datye¹, Lani Miyoshi Sanders¹, Ron Goeke¹, Thomas Hansen^{1,2}, Stig Helveg², Poul Hansen², Bjerne Clausen²,

¹Ceramic and Composite Materials Center

University of New Mexico, Albuquerque, NM 87131, USA

²Haldor Topse A/S, Nymollevvej 55, DK-2800 Lyngby, Denmark

09:20 *Understanding the nature of heterogeneous catalysis and catalysts: Challenges and opportunities*

Jingyue Liu, Monsanto Company

800 N. Lindbergh Blvd., St. Louis, Missouri 63167, USA

Jingyue.liu@monsanto.com

09:45 *In-situ TEM observation of photo-catalytic TiO₂ films prepared by pulse-laser deposition method*

N. Tanaka, K. Yoshida and T. Nanbara

Ecotopia Science Institute and Department of Crystalline Materials Science

Nagoya University, Chikusa-ku, Nagoya, 464-8603, Japan

10:10 *Atomic-scale imaging of metal nanocluster catalysts in their working state*

Stig Helveg, Haldor Topsøe A/S, Nymøllevvej 55, DK-2800 Kgs. Lyngby, Denmark

10.35 **Break- Katchina Ballroom**

In Situ Tools – In Memory of John Wheatley

- 10:55 *Image detector performance requirements for in situ electron microscopy*
Paul Mooney, Gatan, Inc.
- 11:20 *Notes on the nano-revolution: Revealing the nano-scale*
Tom Isabell, JEOL USA, Inc. 11 Dearborn Road, Peabody, MA 01969
- 11:45 *What are the most pressing needs for new dynamic experiments?*
Jan Ringnald, Mike Stekelenburg, Emile Asselbergs, Jan Meulensteen,
Matthijs de Moor, Ronald Marx and Andre Sprankenis
FEI Company
- 12:10 *Dynamical in situ microscopy: Using theory to fill in the gaps*
Peter Rez, Department of Physics and Astronomy, Arizona State
University, Tempe, AZ 85297-1704

12:35 **Lunch – Top of the Rock**

Katchina Ballroom Sections 1-3

1:45 Group Presentations and Discussion/Feedback/Adjustment

Small Group Rooms

2: 45 Small Group Work – Reconsideration, prioritize for next 10 years,
discuss how to achieve priorities, plan and delegate writing

4:00 **Break – Poolside**

Katchina Ballroom Sections 1-3

4.20 Group Presentations and Discussion/Feedback/Adjustment

6.00 Finish

06:30 **Cash Bar**

07:00 **Conference Banquet – Garden Café**

Thursday, January 5, 2006
Katchina Ballroom Sections 1-3

7:30 Breakfast

Dynamic Properties

- 08:30 *A versatile three-contact electrical biasing transmission electron microscope specimen holder for electron holography and electron tomography of working devices*
Rafal Dunin-Borkowski, Department of Materials Science, University of Cambridge, Pembroke Street, Cambridge CB2 3QZ, UK
- 08:55 *In situ TEM study of the electric field-induced phenomena in ferroelectric ceramics*
Xiaoli Tan, Department of Materials Science and Engineering, Iowa State University, Ames, Iowa 50011
- 09:20 *In-situ fabrication, manipulation and property measurements on single nanotubes and nanowires with near atomic resolution*
Lian-Mao Peng, Key Laboratory for the Physics and Chemistry of Nanodevices and Department of Electronics, Peking University, Beijing 100871, China
- 09:45 *Applying the dynamic transmission electron microscope to study the a to b phase transformation in Ti*
Geoffrey H. Campbell, Thomas B. Lagrange, Wayne E. King, Nigel D. Browning, Michael R. Armstrong, Bryan W. Reed, Judith S. Kim, Alan M. Frank, Brent C. Stuart, William J. DeHope, Benjamin J. Pyke, Richard M. Shuttlesworth, Frederic V. Hartemann, and David J. Gibson
University of California, Lawrence Livermore National Lab, Livermore, CA 94550
- 10:10 *In situ microscopy of small particles at ambient temperatures*
Matthew Wise and Peter R. Buseck
Department of Geology, Arizona State University, Tempe AZ 85287
- 10:35 **Break - Katchina Ballroom**
- 10:55 *In-situ and position selective CVD of nanostructures with electron microscopy*
Kazuo Furuya, Guoqiang Xie, Minghui Song and Kazutaka Mitsuishi
National Institute for Materials Science (NIMS),
3-13 Sakura, Tsukuba 305-0003, JAPAN
- 11:20 *The surface kinetics of the initial stages of copper and copper alloy oxidation*

Judith C. Yang, Materials Science and Engineering Department,
University of Pittsburgh, Pittsburgh, PA 15261

11:45 *Atomic scale characterization of vacancy segregation and ordering in oxides*
N. D. Browning^{1,2}, C. J. Mitterbauer¹ and R. F. Klie³
¹Department of Chemical Engineering and Materials Science, University of
California, Davis, CA 95616, USA ²Materials Science and Technology
Division, Chemistry and Materials Science Directorate, Lawrence Livermore
National Laboratory, Livermore, CA 94550, USA, ³Center for Functional
Nanomaterials, Brookhaven National Laboratory, Upton, NY 11973, USA

12:10 *Polar oxide surfaces and interfaces*
Marija Gajdardziska-Josifovska
Department of Physics and Laboratory for Surface Studies, University of
Wisconsin Milwaukee

12:35 **Lunch – Top of the Rock**

Katchina Ballroom Sections 1-3

1:45 Discussion and Coordination of Writing

Small Group Rooms

2: 00 Small Group Work – Write Draft of Report Sections

03:00 **Break – Poolside**

3: 20 Small Group Work – Write Draft of Report Sections

Katchina Ballroom Sections 1-3

5:30 Wrap-up Session

6:00 Finish

Friday, January 6, 2006
Katchina Ballroom Sections 1-3

7:30 **Breakfast**

8:30 Progress Reports/Discussion on Report Writing

Small Group Rooms

9:00 Small Group Work – Finish Report Sections

10:30 **Break - Katchina Ballroom**

Small Group Rooms

10:50 Small Group Work – Finish Report Section

Katchina Ballroom 1-3

11:30 Wrap-up

12:00 **Lunch – Top of the Rock**