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# Materials and Molecular Research Division

Lawrence Berkeley Laboratory  
University of California  
Berkeley, California 94720

Volume 7    Number 1    March 1983

# Newsletter

ANNUAL REVIEW SYMPOSIUM  
OF THE

MATERIALS AND MOLECULAR  
RESEARCH DIVISION  
LAWRENCE BERKELEY LABORATORY

February 28 and March 1, 1983  
(See Program, page 2)

REVIEWERS

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Senior Vice President  
Occidental Research Corporation

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Department of Chemical Engineering  
Stanford University

PROFESSOR RICHARD BRADT  
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DR. JAMES PHILLIPS  
Bell Laboratories

INSTALLATION OF ARM COMPLETED;  
SYSTEMS TESTING NOW UNDER WAY

Systems testing of the new Atomic Resolution Microscope (ARM) by a team of factory and LBL technicians is currently being conducted at the LBL National Center for Electron Microscopy (NCEM), Building 72. Installation of the three-story-high, 1 MeV instrument was completed during January and February in the new addition adjacent to the High Voltage Electron Microscope (HVEM) at the Center. Limited tours are expected to be scheduled during the February 28-March 1 Annual Review Symposium, as testing operations may permit.

The sophisticated million-volt transmission electron microscope is the first in the world capable of imaging individual atoms in any solid material. It has a design resolution of 1.7 Angstroms, permitting scientists to view atoms and even watch structural rearrangements as they occur at the atomic level.

The National Center for Electron Microscopy is available for use by qualified scientists having projects related to the U.S. Department of Energy (DOE) mission.

Scientific Director of the NCEM is GARETH THOMAS, Faculty Senior Scientist at MMRD and Professor of Materials Science and Mineral Engineering at UC Berkeley. RONALD GRONSKY, Staff Scientist, is Manager of the ARM; KENNETH WESTMACOTT, Staff Senior Scientist, is Manager of the HVEM.

VOLLHARDT HONORED FOR  
RESEARCH IN STEROID CHEMISTRY

Professor PETER VOLLHARDT, Associated Faculty Senior Scientist at MMRD, has been designated a recipient of the  
(Continued on page 5)

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## PROGRAM

1983 Annual Review Symposium  
Materials and Molecular Research Division  
Lawrence Berkeley Laboratory  
University of California at Berkeley  
Building 62-Room 203

**Monday, February 28, 1983**

*Alan W. Searcy, Chairman*

- 8:15 COFFEE/REGISTRATION/POSTERS
- 9:00 **A.W. SEARCY**  
*Welcome and Introduction*
- 9:15 **R. GRONSKY**  
*"Atoms at Interfaces:  
Structural and Chemical  
Configurations"*
- 9:55 COFFEE BREAK/POSTERS
- 10:25 **W. LESTER**  
*"Molecular Interactions"*
- 11:05 **L. DE JONGHE**  
*"Whiskers Formation in Gas/  
Solid Reduction Reactions"*
- 11:45 LUNCH/POSTERS  
(LBL Cafeteria, Lower Level)
- 1:15 **Y. SHEN**  
*"Studies of Molecular Adsorbates  
by Nonlinear Optical Techniques"*
- 1:55 **S. LOUIE**  
*"Atomic and Electronic Structure  
of Surfaces"*
- 2:55 **J.W. MORRIS, JR.**  
*"High Field Multifilamentary  
Superconducting Wire"*
- 3:35 **N. BARTLETT**  
*"New Fluorine-Containing  
Compounds of Graphite"*
- 4:15 **W. MILLER**  
*"On Mode-Specificity in Uni-  
molecular Reaction Dynamics"*

**Tuesday, March 1, 1983**

*Rolf H. Muller, Chairman*

- 8:30 COFFEE/POSTERS
- 9:00 **P. ROSS**  
*"High Coverage States of  
Oxygen on Platinum"*
- 9:40 **R. MULLER**  
*"Electrochemical Surface  
Layers"*
- 10:50 **W. JOLLY**  
*"The Partnership of Valence  
and Core Photoelectron  
Spectroscopy"*
- 11:30 **Y. LEE**  
*"Molecular Beam Studies  
of Reaction Dynamics"*
- All sessions are open to Staff and students of LBL and the University of California. From Campus (across from the Mining Circle, opposite the East Guard Gate) take the LBL shuttle bus to Building 62. This bus runs every 20 minutes—starting at approximately 9:10 a.m.—and stops at the top of the road leading down to Building 62.

# AWARDS AND HONORS

## PINES RECEIVES LOUIS A. STRAIT AWARD

Professor ALEX PINES has received the 1982 Louis A. Strait Award "in recognition of (his) outstanding accomplishments in the theory and applications of high resolution NMR of solids." The award consists of a certificate and a medal, and was presented during the Pacific Conference on Chemistry and Spectroscopy last October in San Francisco.

The award is given biennially by the Northern California Society for Applied Spectroscopy (the local section of SAS) in recognition of outstanding accomplishments in spectroscopy. The award is named in honor of the late Louis A. Strait, a founding member of the society and its first recipient.

## IME AWARDS WON BY MMRD WHITTLE GROUP

Three members of the late DAVID WHITTLE's group, KENNETH GAUGLER, HAROUN HINDMAN, and Dr. Whittle (who died in July 1982), have been awarded prizes in the International Metallographic Exhibit held recently in Orlando, Florida. Their entries display several aspects of the materials corrosion and protection program at MMRD.

Second place in the Scanning Electron Microscopy class went to "Short-Circuit Diffusion in  $Al_2O_3$  Scales," which demonstrated "the role of a second, more oxygen-conducting oxide phase (for example,  $HfO_2$ ) in the development of a tortuous alloy-scale interface," said Hindam, who is now affiliated with Energy, Mines and Resources of Canada.

"This configuration is conducive to a remarkable improvement in scale adhesion and an ensuingly superior alloy

oxidation resistance," Hindam explained. The finding has practical importance in the design of alloys and coatings capable of withstanding the conditions encountered in fossil-fuel conversion and combustion systems.

"Continuous Internal Precipitates," received an honorable mention in the same class. A third entry, entitled "Mystery Towers," was awarded first prize in the Pretty Microstructures class.

The exhibit was sponsored by the International Metallographic Society and the American Society for Metals. The winning entries will be included in the Metallographic Exhibit Monograph and featured at several traveling exhibits. Additionally, Hindam will present the work at the forthcoming IMS/ASM/NACE Symposium on Metallography and Corrosion, to be held in Calgary, Alberta, Canada.

## SURESH AWARDED ROBERT LANSING HARDY MEDAL

SUBRAMANIAN SURESH of MMRD and the Department of Materials Science and Mineral Engineering at UC Berkeley has received the Robert Lansing Hardy Gold Medal Award from the Metallurgical Society of the American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME). The award is presented annually to a young scientist under 30 who shows the most outstanding promise in the field of metallurgy. Dr. Suresh currently works with Professor R.O. RITCHIE on aspects of fatigue and fracture mechanics.

## BARTLETT RECEIVES NICHOLS AWARD

U.C. Professor of Chemistry NEIL BARTLETT, MMRD Faculty Senior Scientist, will be the 1983 William H. Nichols Award Medalist of the New York section of the American Chemical Society. The award is "for his synthetic work including the first

compound of a noble gas." It will be presented at a banquet on March 4, during the section's Distinguished Symposium on Chemistry Near the Limits of Oxidation and Bonding. Professor Bartlett's own contribution to the symposium, which will be held at Marymount College, Tarrytown, New York, will be "From the Oxidation of Oxygen to Synthetic Metals--an Oxidative Odyssey."

## SAFETY NOTES

By D. J. Meschi, Chairman, Safety Committee

For the convenience and safety of those who have to carry gallon bottles of reagents (acids, solvents, etc.) from one part of the building to another or between buildings, two plastic bottle-carriers have been placed in the acid room (Rm. 105). These can be signed out on a temporary basis. If you need a carrier for permanent use, please see me in Rm. 245.

Sorption pumps are in fairly common use in our Division because of their many advantages. However, recent occurrences in Bldg. 62 prompt me to call attention to a few disadvantages.

A research worker attempted to bake out a sorption pump that had been sealed off with a Swage-Lok fitting. An explosion resulted. The obvious moral is that a sorption pump should be vented during bake-out, but this is not all.

After the explosion, Walt Toutolmin took the damaged pump to his office. Both he and Glenn Baum, who share the office, later noticed that their throats were being affected by vapors from the molecular-sieve material exposed in the ruptured pump. Apparently the pump had been used with some irritating substance. Had the pump been vented into the laboratory during bake-out, a common procedure, the irritant would have been desorbed

directly into the work area. So I would like to suggest a second moral: If a sorption pump has been used with a hazardous or potentially irritating material, vent it into a hood during bake-out.

## MMRD PEOPLE

CORDELLE YODER, Professor PITZER's secretary on campus, spent Christmas and New Year's with 815 other passengers on a 12-day cruise through the Panama Canal. Embarking in Miami, they stopped at several islands and cities, including Ocho Rios (Jamaica), Cartagena (Columbia), Panama City, and Acapulco, where everybody flew home.

With the exception of a hurricane on the fourth day and evening out, Yodelle reports, it was a warm and restful trip. And since the ship--the Greek "Royal Odyssey"--had eight decks and 360 crew members, the storm did not give much cause for worry. Even a celebrity was on board--movie star June Allyson, two of whose films were shown.

### SEABORG CO-EDITS "NUCLEAR CHEMISTRY"

GLENN SEABORG--University Professor Emeritus at UCB, LBL Associate Director at Large, and MMRD Faculty Senior Scientist--is co-editor, with Walter Loveland, of Nuclear Chemistry, a volume in the Benchmark Papers series published by Hutchinson Ross, Stroudsburg, PA; the book appeared last November. The "Benchmark" series collects historic papers in the fields of physical chemistry and chemical physics. Loveland, professor of chemistry at Oregon State University, Corvallis, has also been a visiting scientist at LBL.

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DAVID RIECK joined MMRD December 6, 1982 as a visiting Postdoctoral Research Associate with Professor JAMES EVANS's group.

VOLLHARDT HONORED  
(Continued from page 1)

Adolf Windaus Medal, an award conferred by the German Chemical Society. The honor is reserved for a "scientist well known for outstanding contributions, preferably to steroid chemistry."

Vollhardt, who also teaches chemistry at UC Berkeley, has been investigating

the use of transition metal catalysts to put together complex molecules from very simple ones. His research may enable chemists to make synthetics in fewer steps and may also lead to the discovery of compounds with novel activity.

The Windaus medal will be presented to Vollhardt later this year at the University of Göttingen.

# For Reference

Not to be taken from this room

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MATERIALS AND MOLECULAR RESEARCH DIVISION

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MMRD NEWSLETTER

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