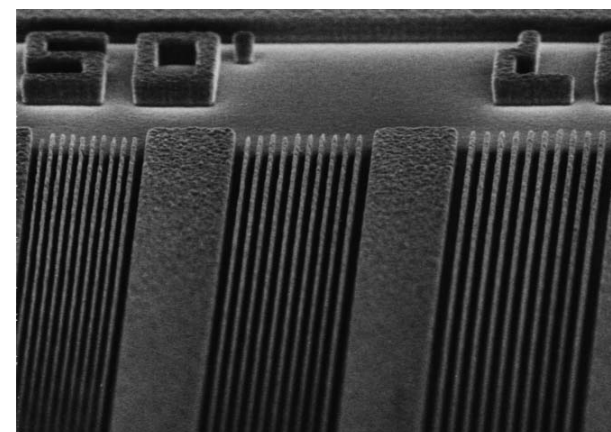


Non Profit
Organization
US Postage Paid
Los Altos, CA 94022
Permit No. 383

The
NORTHERN CALIFORNIA
ELECTRONIC MATERIALS
SYMPOSIUM



THE 27th Annual
NORTHERN CALIFORNIA

ELECTRONIC MATERIALS SYMPOSIUM

A One-Day Symposium on Electronic
Materials Featuring Outstanding Authorities
in Their Respective Fields

SUNNYVALE HILTON
1250 LAKESIDE DR.
SUNNYVALE, CALIFORNIA

Monday
March 29, 1999
8:00 AM



PROGRAM

Monday, March 29, 1999
Sunnyvale Hilton

8:00 Registration

MORNING SESSION

Session Chair: Dr. Paul McIntyre
Stanford University, Stanford, CA

8:30 **Welcome Remarks and Introduction**
Dr. Melisa Buie
Applied Materials, Santa Clara, CA

8:40 "Oxygen Precipitation Phenomena in 300 mm
Czochralski Polished Silicon Wafers"
Dr. Howard Huff
Sematech, Austin, TX

9:25 "Extreme Ultraviolet Lithography: 70nm Critical
Dimensions and Beyond"
Dr. Don Sweeney
LLB Labs, Livermore, CA

10:10 **REFRESHMENTS** (Vendor Exhibit Area)

10:40 "Lead Free Solder"
Dr. Fay Hua
HP, Palo Alto, CA

11:30 **LUNCHEON**

12:15 **The twenty-fourth annual Ross Tucker Award**

12:25 "Bicycle Design for the Millennium"
Mr. Ric Hjertberg
WHEELSMITH

AFTERNOON SESSION

Session Chair: Dr. Raj Apte
Xerox PARC, Palo Alto, CA

1:30 "Process Development and Electrical
Characterization of Etched Copper Interconnects"
Dr. Diana Ma
Applied Materials, Santa Clara, CA

2:15 "Challenges in the Near Future to Magnetic
Recording"
Dr. Robert L. (Bob) White
Stanford University, Stanford, CA

3:00 **REFRESHMENTS** (Vendor Exhibit Area)

3:30 "Blue Nitride Semiconductor Lasers: Why and
How Do They Work?"
Dr. Arto Nurmikko
Brown University, Providence, RI

4:15 "Silicon Micro-Machining for On-Chip DNA
Sequencing"
Dr. Richard Mathies
Univ. Of California, Berkeley, CA

5:00 **HOSTED COCKTAIL PARTY**
(Vendor Exhibit Area)

VENDOR'S SHOW

8:00-5:00 Vendors Exhibits

General Information

The Symposium registration covers admission to the Symposium sessions, abstracts of the Symposium presentations, luncheon, a vendor's exhibit, and a partially hosted cocktail hour following the Symposium. Beverage tokens for the cocktail hour will be available in the vendor area during the afternoon sessions. Physical limitations require the attendance to be limited to 400 registrants.

Costs of the Symposium have been kept to a minimum to encourage attendance. A discounted registration fee is available until March 16, 1999, because of the lower cost of handling preregistration and early arrangement commitments. To reserve your place in the Symposium and in the luncheon, we urge you to register early by mail, using the attached form. All registration is transferable but not refundable.

During the Symposium, the twenty-fourth annual Ross N. Tucker Memorial Awards will be presented to two Bay Area graduate students in recognition of excellence in research.

The Symposium features a Vendor's exhibit. Information and displays of new materials, processing equipment, and analytical instruments will be presented by representatives of manufacturers.

A partially hosted cocktail hour will follow the Symposium presentations. This provides an opportunity for informal discussions with Symposium speakers, vendors and attendees.

Registration material and abstracts of the Symposium presentations will be provided at the registration booth.

The opening session will begin promptly at 8:30AM. Registration begins at 8:00AM. The vendors area will be available for setup at 7:00AM.

Further questions regarding the Symposium should be directed to Dr. David Fork, Xerox Palo Alto Research Center. Phone: 650-812-4121, email: fork@parc.xerox.com.

The Electronic Materials Symposium Committee exists to promote the understanding of electronic materials within the industrial and academic communities of the San Francisco Bay area. This committee organizes the annual Electronic Materials Symposium, featuring presentations on advanced electronic, magnetic and optical materials processing, characterization and devices by outstanding speakers who have made significant contributions to their fields. Proceeds of the symposium are used to support electronic materials research and education in local universities.

ABOUT THE COVER

XX
SEM micrographs of 50 to 90 nm etched lines patterned with Extreme Ultraviolet Lithography (EUV). Courtesy of the VNL (Sandia, Lawrence Livermore and Lawrence Berkeley National Laboratories) and the EUV/LLC (Intel, Motorola and AMD).
XX

ABOUT THE SPEAKERS

Ric Hjertberg founded WheelSmith 24 years ago and the company has since become known for many fundamental improvements in bicycle design and retail practice. Ric has authored over 40 articles on these subjects in the bicycle press and regularly consults to dealers and manufacturers. WheelSmith has built the wheels for the US National Team and Olympic Teams since the early '80's and has been involved with many professional teams and competitors. Ric has just returned from the Chicago Bike Show where he presented several seminars on technical and retail cycling subjects.

Fay Hua received her Ph.D. in Materials Science and Engineering from Vanderbilt University in 1995 for her dissertation "Solidification of Eutectic Pb-Sn Solders". She joined Hewlett Packard after graduation. She has worked on Pb-free solders for the past three years. Her other projects have included low temperature soldering and flip-chip BGA package development and qualification.

Howard Huff received his B.S. in Engineering Science from New York University (1960), his M.S. in Physics from the Stevens Institute of Technology (1962) and his Ph.D. in Metallurgy from M.I.T. (1966). Dr. Huff joined Texas Instruments, Inc. in 1966 where he held variety of research, engineering and production positions for the manufacture of both MOS and bipolar circuits. In 1979, Dr. Huff joined Signetics Corp. as a Senior Program Coordinator in the Philips Research Labs in Sunnyvale, CA. where he was responsible for IC related silicon materials issues. In 1983, he joined the Monsanto Electronic Materials Co. (MEMC) in Palo Alto as Director of Market Development. Dr. Huff joined SEMATECH in 1988, where he is a Senior Fellow and Program Manager for Gate Stack Engineering and Silicon Materials. Dr. Huff is also the chair of the Starting Materials section of the SIA Roadmap and co-chair of the SEMI North America 300 mm Wafer Dimensions Task Force.

Diana Ma came to Applied Materials 1992 where she is currently the General Manager for the Metal Etch Division. In the progression from Technologist to her current position, she has played a major role in the development of many sub-micron etch processes and reactors, including sub-quarter-micron aluminum and tungsten processes on DPS. Dr. Ma spent five years in process and reactor development engineering at Lam Research Co. At Applied Materials she worked on P5000 enhancement and MxP development before initiating development and commercialization of DPS metal etch technology. She has received many awards for technical excellence, has published widely, and holds a number of U.S. patents.

Richard Mathies received his B. S. Degree in Chemistry in 1968 at the University of Washington. He earned the M. S. Degree in 1970 and the Ph. D. in 1973 in Physical Chemistry at Cornell University. Following two years of postdoctoral study as a Helen Hay Whitney Postdoctoral Fellow at Yale, he moved to the Chemistry Department at the University of California at Berkeley in 1976 where he is Professor of Chemistry. Mathies' work at Berkeley initially focused on the use of resonance Raman and time resolved optical spectroscopy to elucidate the structure and reaction dynamics of energy and information transducing photoactive proteins. Mathies' more recent work in the area of biotechnology and the Human Genome Project has led to the development of new high-speed, high-throughput DNA analysis technologies such as capillary array electrophoresis and energy transfer fluorescent dye labels for DNA sequencing and analysis. He also pioneered the development of microfabricated capillary

electrophoresis devices, capillary array electrophoresis microplates, and microfabricated integrated sample preparation and detection methods. He is author of over 200 publications and patents on photochemistry, photobiology, bioanalytical chemistry and genome analysis technology.

Arto V. Nurmikko was born in Finland. He received his all his degrees from the University of California at Berkeley. He is presently the L.Herbert Ballou University Professor of Engineering and Physics at Brown University. Professor Nurmikko is a fellow of the American Physical Society, the Optical Society of America, and IEEE.

Donald Sweeney received his Ph.D. in oherent Optics, from University of Michigan in 1972. Between 1972 and 1983, Dr. Sweeney was Professor of Mechanical Engineering at Purdue University and acted as a consultant for Lawrence Livermore National Laboratory (LLNL), Bendix Research Laboratories, KMS Fusion, Inc., and the United States Army Missile Command, among others. In late 1983, Dr. Sweeney joined the technical staff of Sandia National Laboratories in Livermore, where he managed the Imaging Technology Division. In 1990, he became Department Manager for the Reacting Flow Department of the Combustion Research Facility. Dr. Sweeney left Sandia in 1993 to join the Information Science and Technology Program (IS&T) at LLNL and became Deputy Program Leader in 1996. He assumed the role of Program Leader in November of 1997. Dr. Sweeney brings extraordinary knowledge in the fields of diffractive and holographic optical elements, digital holography, optical diagnostics, image reconstruction, coherent optics and optical and digital image processing to IS&T's leading-edge effort. Results of his research have been extensively published through over 100 journal and meeting papers. Dr. Sweeney is a Fellow of the Optical Society of America.

Robert L. (Bob) White received his B.A. in physics and mathematics from Columbia College in 1949 and his M.A. and Ph.D. in physics from Columbia University in 1951 and 1954 respectively. Upon completion of his graduate studies at Columbia University, Dr. White joined the staff of the Hughes Research Laboratories. There he participated in and directed investigations in the areas of ferromagnetic resonance, paramagnetic resonance and optical spectroscopy, leaving Hughes in 1961 to join General Telephone and Electronic Laboratories in Palo Alto as Head of the Magnetics Department. Dr. White joined the faculty of Stanford University in May of 1963. He was the William E. Ayer Professor of Electrical Engineering 1983-1988, Vice-Chairman of the Department of Electrical Engineering 1976-1981, and Chairman from 1981-1986. From 1987 until 1990 he was Director of the Exploratorium science museum in San Francisco. He is presently a Professor in the Department of Materials Science and Engineering at Stanford and Director of the Stanford Center for Research on Information Storage Materials. His present research centers on magnetic thin films for data storage application, both as media and in read/write heads. His special interests are giant magnetoresistance, exchange anisotropy, and patterned media.

The Twenty-Fourth Annual Ross Tucker Award Recipients

Symposium Committee

Symposium Committee

<i>Emily Allen</i> (SJSU)	<i>Judy Glazer</i> (HP)	<i>Zequn Mei</i> (HP)
<i>Raj Apte</i> (Xerox)	<i>Scott McHugo</i> (LBL)	<i>Bill Miller</i> (IBM)
<i>Maximilian Biberger</i> (Novellus)	<i>Bill Imler</i> (HP)	<i>Shekhar Pramanick</i> (AMD)
<i>Larry Comstock</i> (SJSU)	<i>Paul McIntyre</i> (Stanford)	<i>Irfan Saadat</i> (National)
<i>David Fork</i> (Xerox)		<i>Rick Schneider</i> (HP)

Melisa Buie (Appl. Materials), 1999 Chair

Symposium Sponsors

Northern California Section of TMS

IEEE Electron Device Society, Santa Clara
Valley Chapter

REGISTRATION FORM - 27TH ANNUAL ELECTRONIC MATERIALS SYMPOSIUM (1999)

Name:	Title:	M/S:
Org:	City, St., Zip:	
Mailing Add.:		
<u>Symposium Date:</u> March 29, 1999	<u>Registration Fee</u>	<u>Pre-registration by March 22, 1999</u>
Regular Registration (please circle)	\$85	\$70
Full-Time Registered Student	\$35	\$25
<p>Make checks payable to: Electronics Materials Symposium and send along with the above information to: EMS, c/o Dr. Emily Allen, SJSU, Dept. of Materials Engineering, One Washington Sq., San Jose, CA 95192-0086. Any questions should be directed to Prof. Allen at (408) 924-4010 or email: elallen@email.sjsu.edu. Do not send purchase orders or credit card information. The Tax ID for the Symposium is: 25-1484913. Please make sure your name and affiliation are clearly identified. Cancellation: registrations may be transferred/substituted but are non-refundable. No confirmation of registration will be sent.</p>		