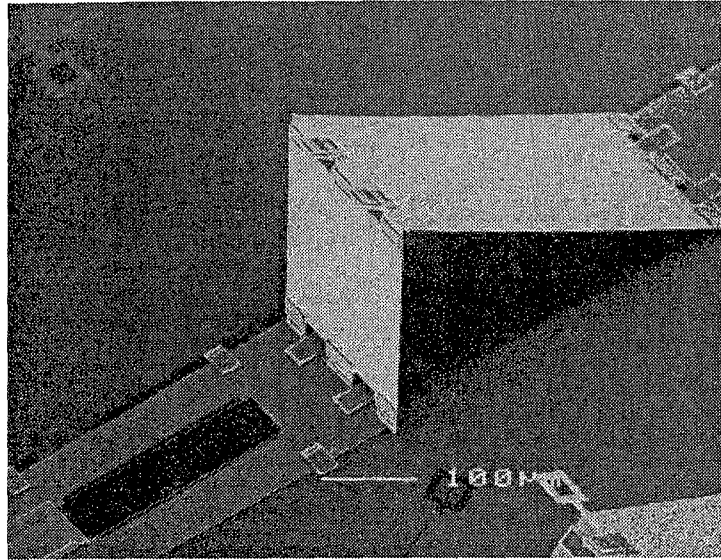


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The  
NORTHERN CALIFORNIA  
ELECTRONIC MATERIALS  
SYMPOSIUM



THE 23rd ANNUAL  
**ELECTRONIC MATERIALS  
SYMPOSIUM**

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

LE BARON HOTEL  
1350 N. FIRST STREET  
SAN JOSE, CALIFORNIA

Monday  
March 20, 1995  
8:00 AM

**PROGRAM**

Monday, March 20, 1995

Le Baron Hotel

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- 8:00 Registration
- MORNING SESSION (Fiesta Ballroom)**
- Session Chair: Prof. Bruce Clemens  
Stanford University  
Stanford, CA
- 8:30 **Welcoming Remarks and Introduction**  
Dr. John Yue  
Advanced Micro Devices, Sunnyvale, CA
- 8:40 **"Low Dielectric Constant Material for Interconnect and Gap Fill"**  
Dr. Chiu Ting  
SEMATECH, Houston, TX
- 9:25 **"Growth and Characterization of High-Quality AlGaN Heteroepitaxial Films"**  
Prof. Russell D. Dupuis  
University of Texas, Austin, TX
- 10:10 **REFRESHMENTS (Vendor Exhibit Area)**
- 10:40 **"Giant Magnetoresistance: A Path To The Next High Density Recording Head"**  
Dr. Bruce Gurney  
IBM, San Jose, CA
- 11:30 **LUNCHEON**
- 12:15 **The twenty first annual Ross Tucker Award**
- 12:25 **"Hubble Space Telescope: Expanding Our View of the Universe"**  
Ray Villard  
John Hopkins University, Baltimore, MD
- AFTERNOON SESSION (Fiesta Ballroom)**
- Session Chair: Dr. David Fork  
Xerox PARC  
Palo Alto, CA
- 1:30 **"Materials and Technology for Micro-Electro-Mechanical Systems"**  
Prof. Richard Muller  
University of California, Berkeley, CA
- 2:15 **"Thin Gate Dielectrics in Deep Subhalf Micron ICs"**  
Dr. Michael Depas  
IMEC, Belgium
- 3:00 **REFRESHMENTS (Vendor Exhibit Area)**
- 3:30 **"Integrated Ferroelectrics for Information Storage"**  
Prof. Tim Sands  
University of California, Berkeley, CA
- 4:15 **"CVD Cu and Al Metallization Films"**  
Prof. Alain Kaloyeros  
SUNY, Albany, NY
- 5:00 **HOSTED COCKTAIL PARTY**  
(Vendor Exhibit Area)

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**VENDOR'S SHOW**

8:00 - 5:00

**Vendor's Exhibits**

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**GENERAL INFORMATION**

The registration to the Symposium 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 that attendance be limited to 400 registrants.

Costs for the Symposium have been kept to a minimum to encourage attendance. A discounted registration fee is available until March 13, 1995 because of the lower cost of handling preregistration and early arrangements commitments. To reserve your place at the Symposium and the luncheon, we urge you to register early by mail, using the attached form. No refunds of registration fees will be made after Monday, March 13, 1995.

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

We are excited to have Ray Villard of the Space Telescope Science Institute at John Hopkins University as our luncheon speaker this year. Ray is responsible for disseminating news about the most recent discoveries made with the Hubble Space Telescope. He was previously associate editor for *Astronomy* and *Star & Sky* magazines and he is a frequent contributor to National Public Radio's *Stardate* series.

The Symposium features a Vendor's exhibit. Information and displays of new materials, processing equipment, and analytical instruments will be presented by representatives of the 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 8:30 A.M. Registration begins at 8:00 A.M. The vendor area will be available for setup at 7:00 A.M.

The Electronic Materials Symposium Committee exists to promote the understanding of electronic materials within the industrial and scientific 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 teaching in local universities.

Further questions regarding the Symposium should be directed to Dr. John Yue, Advanced Micro Devices, MS143, P.O. Box 3453, Sunnyvale, CA 94088, Phone: (408) 749-3189, e-mail: jyue@brahms.amd.com.

**ABOUT THE COVER**

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The cover photo shows a tilt up mirror fabricated on a silicon wafer. The mirror is constructed parallel to the wafer surface then lifted out of the wafer surface by pushing the sliders which are attached by polycrystalline silicon hinges. This photo is courtesy of Prof. Kam Lau and Prof. Richard Muller of the University of California, Berkeley.

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## ABOUT THE SPEAKERS

**Dr. Michel Depas** obtained his MS and Ph.D. degree in electrical engineering at the University of Ghent, Belgium. From 1990 to 1994 he was a research assistant of the National Fund for Scientific Research at the University of Ghent and IMEC. Presently he is a member of the ultra-clean processing group in IMEC investigating ultra-thin gate oxides for future MOS applications.

**Prof. Russell D. Dupuis'** technical specialties include semiconductor materials and devices, epitaxial growth by metalorganic chemical vapor deposition (MOCVD), and heterojunction structures in compound semiconductors. He received his Ph.D. in EE from the University of Illinois in Urbana-Champaign in 1973. He worked at Texas Instruments from 1973 to 1975. In 1975, he joined Rockwell International where he demonstrated that MOCVD could be used for the growth of high-quality semiconductor thin films and devices. He joined AT&T Bell Laboratories in 1979 where he extended his work to the growth of InP-InGaAs by MOCVD. In 1989 he became a Professor in the Department of Electrical and Computer Engineering at the University of Texas at Austin. He is currently studying the growth of III-V compound semiconductors by MOCVD, including materials in the InAlGaIn system.

**Dr. Bruce A. Gurney** is a research staff member in the Storage Systems and Technology function of the International Business Machines Corp Almaden Research Center. His interests lie in the fundamental underpinnings of present and future magnetic recording technologies; his research concentrates on the influence of surfaces, interfaces, and finite size on the properties of magnetic single layers, sandwiches, superlattices, and other artificial structures. Most recently he has investigated the mechanisms of magnetotransport in giant magnetoresistance and spin valve layered materials, where he has authored 12 papers. He has also investigated the influence of size on the spinwaves of ferromagnetic metals using Brillouin light scattering. He holds several patents on magnetoresistive sensor technology. Before joining IBM he received a Ph.D. (1987) in Physics from Cornell University and BS (1979) in Physics from the California Institute of Technology.

**Prof. Alain E. Kaloyeros** is presently Professor of Physics and Director of the New York State Center for Advanced Technology (CAT) in Thin Films and Coatings at the University at Albany-SUNY. He is also Co-director of the Albany-Rensselaer Joint Laboratories for Advanced Materials (JLAM). He joined Albany after receiving his Ph.D. in Experimental Condensed-Matter Physics from the University of Illinois at Urbana-Champaign in 1987 and staying there as postdoctoral research associate until mid-1988. He has been heavily involved in the development of tailored vapor phase techniques of the growth of advanced electronic, optoelectronic, and photonic thin films and multilayered structures for applications in conventional and optical interconnects for intra- and inter-chip applications. His work also includes characterization of film surfaces, interfaces, and bulk properties by electron-, ion-, and x-ray spectroscopies. His awards include a National Presidential Young Investigator (PYI) Award and an NSF Engineering Research Initiation Award (RIA). Professor Kaloyeros has four inventions in the fields of chemical vapor deposition of copper, aluminum, and titanium, and over fifty technical publications.

**Prof. Richard S. Muller** received the degree of Mechanical Engineer from Stevens Institute of Technology and the MS/EE and Ph.D. at the California Institute of Technology. He joined the faculty in the Department of EECS at the University of California, Berkeley in 1962 and is now Professor and Co-Director of the Berkeley Sensor & Actuator Center, an NSF/Industry/University research center. His research interests are now focused on microelectromechanical systems with recent efforts directed mostly toward microelectrooptical devices and National Academy of Engineering of the United States, a Fellow of the IEEE, and the Chairman of the Sensors Advisory Board and member of the Advisory Committee for the Electron-Devices Society of IEEE. Active in the administration and planning for many MEMS conferences, Muller wrote the founding proposal for the IEEE/ASME JMEMS and now serves as Editor-at-large of this journal as well as the North-American editor of Sensors and Materials, and editorial-board member of Sensors and Actuators, and Nanotechnology. Together with Dr. T. I. Kamins of Hewlett-Packard Co., he is the author of "Device Electronics for Integrated Circuits," (Wiley) second edition, 1986. He is a co-editor of "Microsensors," a volume in the IEEE PRESS Selected Reprint Series, published in 1990.

**Prof. Tim Sands** is currently a Professor on the faculty of the Materials Science & Mineral Engineering Department at the University of California, Berkeley. Prior to joining the faculty in 1993, Dr. Sands served as Director of the Nonvolatile Memory Research Group at Bellcore in Red Bank, NJ, where he was employed since receiving his Ph.D. in Materials Science from Berkeley in 1984. Dr. Sands has conducted research in semiconductor processing, metal/semiconductor reactions and contacts, metal/compound semiconductor epitaxy, magnetic and magneto-optic thin films, ferroelectric thin films and devices, and storage technology in telecommunications.

**Dr. Chiu Ting** is on assignment from Intel to the Strategic Technology group of SEMATECH since March 15, 1993. At SEMATECH he initiated several projects to study metallization and dielectric processes for advanced interconnect applications. He has been a Principal Engineer at Intel Santa Clara, CA since 1981 where he led a group working on a variety of IC processing technologies, including advanced lithography and multilayer interconnection. From 1961 to 1981, he was with IBM Corp. at San Jose, CA, East Fishkill and Yorktown Heights, NY, working on E-Beam lithography, bipolar and MOS IC processing. He received his B.S. degree from UC Berkeley, M.S. and Ph.D. degrees from Stanford University, all in Electrical Engineering.

**Ray Villard** has specialized in communicating astronomy to the general public for the past 20 years. As Public Information manager for the Space Telescope Science Institute at the Johns Hopkins University in Baltimore, MD, he is responsible for disseminating news about the most recent discoveries made with the Hubble Space Telescope. He previously was associate editor for *Astronomy* and *Star & Sky* magazines, and has written a variety of freelance articles. Mr. Villard has scripted shows for planetariums at the Boston Museum of Science, Maryland Science Center, St. Louis Science Center, and Rochester Museum and Science Center.

## 1995 Ross Tucker Award Recipients

*Matthew R. Linford*  
Department of Chemistry  
Stanford University  
*"The First Synthesis and Characterization of Alkyl Monolayers on Silicon"*

*Charles R. Sullivan*  
Department of Electrical Engineering  
University of California at Berkeley  
*"Microfabrication of Magnetic Components for High Frequency Power Conversion"*

## SYMPOSIUM COMMITTEE

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<i>Kent Carey</i> HP	<i>Eugene Meieran</i> Intel
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<i>Jerry Hurst</i> IBM	<i>Martin Scott</i> HP
<i>Dah-Bin Kao</i> National Semiconductor	<i>Baylor Triplett</i> Intel

## SYMPOSIUM CHAIR

*John Yue*  
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<u>Symposium Date: March 20, 1995</u>	<u>Registration Fee</u>	<u>Pre-registration by March 13, 1995</u>
Regular Registration (please circle)	\$75	\$55
Full-Time Registered Student	\$40	\$20

Make check payable to: **Electronic Materials Symposium** and send with the above information to: Dr. John Yue, Advanced Micro Devices, MS143, P.O. Box 3453, Sunnyvale, CA 94088. Any questions should be directed to Dr. Yue at (408) 749-3189 or jyue@brahms.amd.com. Do not send purchase orders. The Tax ID number for the Symposium is: 25-1484913. Please make sure your name and affiliation are clearly identified.