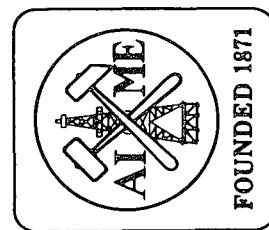
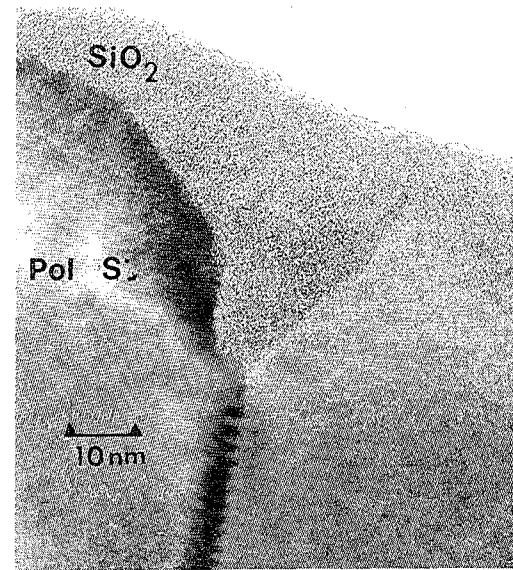


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 THE NORTHERN CALIFORNIA METALLURGICAL SECTION



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The  
**NORTHERN CALIFORNIA  
 METALLURGICAL SECTION**  
 of  
**AIME**  
 presents  
**THE THIRTEENTH ANNUAL  
 ELECTRONIC MATERIALS SYMPOSIUM**

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

**MARRIOTT HOTEL  
 GREAT AMERICA PARKWAY  
 SANTA CLARA, CALIFORNIA**

Monday  
 March 18, 1985  
 7:30 A.M.

**PROGRAM**

Monday, March 18, 1985

Marriott Hotel

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7:30 Registration  
**MORNING SESSION** (California Ballroom - Center)

Session Chairman: Dr. Dixie Sinkovits  
 Perkin-Elmer/PHI  
 San Jose, CA

8:30 **Welcoming Remarks and Introduction**  
 Prof. Krishna Saraswat  
 Stanford University, Stanford, CA

8:40 **"Silicide Formation: Lateral Structures and  
 Device Geometries."**  
 Prof. James Mayer  
 Cornell University, Ithaca, New York

9:30 **"Perspectives on Selective LPCVD of Tungsten in  
 Advanced Integrated Circuits."**  
 Dr. Robert S. Blewer  
 Sandia National Laboratories, Albuquerque, NM

10:20 **REFRESHMENTS** (California Ballroom - Right)

10:50 **"High Resolution Microscopic Studies of  
 VLSI Interfaces."**  
 Prof. John C. Bravman  
 Stanford University, Stanford, CA

11:45 **LUNCHEON** (California Ballroom - Left)

12:20 **Ross Tucker Award**

12:30 **"The Role of Crystallography in the Manufacture of  
 Quartz Crystal Oscillators in World War II."**  
 Dr. William Parrish  
 IBM Research Laboratory, San Jose, CA

**AFTERNOON SESSION** (California Ballroom - Ctr)

Session Chairman: Dr. Kurt Petersen  
 Transensory Devices  
 Fremont, CA

1:30 **"Heterostructures for Everything: The Future of  
 Compound Semiconductor Devices?"**  
 Prof. Herbert Kroemer  
 University of California at Santa Barbara

2:15 **"Advanced CMOS Epitaxial Technology for Improved  
 Latchup Immunity and Device Performance."**  
 Mr. John O. Borland  
 Applied Materials, Inc., Santa Clara, CA

3:00 **REFRESHMENTS** (California Ballroom - Right)

3:30 **"High Rate Plasma Etching."**  
 Dr. Richard Bruce  
 Xerox Palo Alto Research Center, CA

4:15 **"Rapid Thermal Processing."**  
 Dr. Thomas O. Sedgwick  
 IBM Watson Research Center, Yorktown Hts., NY

5:00 **HOSTED COCKTAIL PARTY**  
 (California Ballroom - Left)

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**VENDOR'S SHOW** (California Ballroom - Right)

8:00 - 5:00 **Vendor's Exhibits**

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**GENERAL INFORMATION**

The registration to the Symposium covers admission to the Symposium sessions, extended abstracts of the Symposium presentations, luncheon, a vendor's exhibit, and a partially hosted cocktail hour following the Symposium. Two tokens are included in the registration envelope. Physical limitations require that attendance be limited to the first 400 registrants.

Costs for the Symposium have been kept to a minimum to encourage attendance. A surcharge will be required from those who do not register by March 4, 1985, because of added costs for arrangements after that date. 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 4, 1985.

During the Symposium, the eleventh annual Ross N. Tucker Memorial Award will be presented to a Bay Area student in recognition of excellence in research.

We are honored to have Dr. William Parrish, an IBM Research Staff Member, as our luncheon speaker. Dr Parrish has had a long term involvement in the analysis of solid state materials, and can speak from personal experience about the beginnings of the "age of solid state materials."

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 extended 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 7:30 A.M. The vendor area will be available for setup at 7:00 A.M.

Further questions regarding the Symposium should be directed to Prof. Krishna Saraswat, Integrated Circuits Laboratory, Dept. of Electrical Engineering, Stanford University, Stanford, CA 94305; (415) 497-2956.

**ABOUT THE COVER**

A high-resolution cross-sectional transmission electron micrograph of poly-silicon showing a grain boundary.

## ABOUT THE SPEAKERS

**Dr. Robert S. Blewer** is responsible for the LPCVD effort at Sandia National Laboratories, where he has been active in materials research and characterization techniques for the past 15 years. He served as a guest scientist during that time for one year at the Max-Planck-Institut for Plasma Physics in Munich, West Germany in 1977-78, after pioneering a new RBS technique to detect and profile low Z elements in solids. At Sandia, Dr. Blewer has held positions in the Applied Physics Division, Management Staff, Fusion Materials and Component Division, and Microelectronic Materials and Processes Division. He has authored or coauthored 70 technical publications.

**Mr. John Ogawa Borland** received his B.S. and M.S. degrees in Material Science and Engineering from the Massachusetts Institute of Technology in Cambridge, MA. He completed his Master's thesis on InP Molecular Beam Epitaxy at Nippon Telegraph and Telephone Musashino Electrical Communication Laboratories in Japan. Currently he is investigating advanced CMOS epitaxial technology in the CVD Applications Laboratory of Applied Materials, Inc., in Santa Clara, CA. Prior to joining Applied Materials in 1983, he was at National Semiconductor Corporation working on front end process development in the Solid State Technology Center of the VHSIC CMOS Development group. He is a member of the Electrochemical Society, the Materials Research Society, and the American Association for Crystal Growth.

**Prof. John C. Bravman** obtained both his undergraduate and graduate education in the Department of Materials Science and Engineering at Stanford University, where he completed his Ph.D. in 1984. During the period 1979 to 1984 he was employed as an Associate Engineer by Fairchild Semiconductor, following which he joined the faculty at Stanford. Professor Bravman's research concerns the application of transmission electron microscopy to the study of the interplay between semiconductor processing and material microstructure, with an emphasis on interfacial morphology. He is the author or co-author of 11 technical publications.

**Dr. Richard Bruce** is currently manager of VLSI technology at XEROX Palo Alto Research Center where he is involved in process development, device design, and process integration for advanced CMOS technology. Prior to joining Xerox he was with Perkin-Elmer Co., where he was involved in research and development of plasma etching processes. He received the Ph.D. degree in solid state physics from the University of California at Santa Barbara in 1975 and studied optical properties of materials at the City College, City University of New York.

**Prof. Herbert Kroemer** is Professor of Electrical Engineering at the University of California at Santa Barbara (UCSB). He joined UCSB in the Fall of 1976, coming from the University of Colorado (Boulder) where he was Professor of Electrical Engineering from 1968 to 1976.

Prof. Kroemer was born in 1928 and educated in Germany. He received a Ph.D. in Physics (Solid State Theory) in 1952 from the University of Gottingen, Germany, with a thesis on the theory of hot-electron effects in the then-new transistor. Since then he has worked on the physics and technology of semiconductors and semiconductor devices in various research laboratories in Germany and the U.S. He is the originator of several important device concepts

such as the drift-transistor, the wide band-gap emitter, the double-heterojunction injection laser, and other heterojunction concepts. In 1964 he was the first to publish an explanation for the Gunn effect.

Prof. Kroemer is a Fellow of the IEEE and the APS. He was Chairman of the 1972 International Symposium on GaAs and Related Compounds, the 1974 Device Research Conference, and the 1981 MBE Workshop. In 1973, he was the recipient of the J J Ebers Award of the IEEE for outstanding technical contributions to electron devices. In 1982 he received the ASEE Award for excellence in research and teaching.

His current research interests are in semiconductor heterojunctions, including their physics, their technology and their utilization.

**Prof. James W. Mayer** received a BSME from Purdue University in 1952 and after two years in the U.S. Army Ordnance Corps he returned to Purdue and obtained a Ph.D. in Physics in 1960. He joined Hughes Aircraft Co. in 1959 and worked on nuclear particle detectors, double injection in semiconductors, and ion implantation at the Research Laboratories.

In 1967, Dr. Mayer was appointed to the faculty of Electrical Engineering at Caltech where he investigated Rutherford backscattering and channeling, silicide formation, and solid-phase epitaxy. Along with his appointment as Professor of Electrical Engineering, he was a SCUBA instructor and Master of Student Houses (1975-1980).

In 1980, J. W. Mayer joined the Department of Materials Science and Engineering at Cornell University as the Francis N. Bard Professor of Materials Science. At present he investigates ion beam modification of materials, thin-film reactions and silicide formation, and pulsed ion-beam and laser-induced melting of semiconductor structures. He is a Fellow of the American Physical Society and IEEE, a scientific member of the Bohmische Physical Society, and recipient of the 1981 Von Hippel Award of the Materials Research Society.

**Dr. William Parrish** received his Ph.D. from MIT in 1940. He taught crystallography at Pennsylvania State University and was appointed Chief Technologist in the quartz oscillator program of the U.S. Signal Corps in World War II. He headed a research group at Philips Laboratories for 25 years and developed the modern X-ray diffractometer. Since 1970, he has been the manager of the Crystallography and X-Rays Department at the IBM Research Laboratory in San Jose, CA, specializing in X-ray characterization of materials and computer X-ray analysis. Dr. Parrish is the author of 250 papers and books, Fellow of the Mineralogical Society of America, American Crystallographic Association, and others.

**Dr. Thomas O. Sedgwick** received a Ph.D. in Chemistry in 1961 from Brooklyn Polytechnic Institute. He spent the following year of 1962 as doctoral fellow at the Univ. of Munich. Since then he has been a Research Staff Member at the IBM Watson Research Center in Yorktown with major interests in CVD, epitaxy of Si and Ge, high temperature chemistry, SOI, laser annealing, and, more recently, Short Time Annealing. In addition he is an avid skier, runner and white water canoeist.

### 1985 Ross Tucker Award Recipient

To be announced

### CONFERENCE COMMITTEE

<i>John Chen</i>	<i>Aare Onton</i>
Xerox	IBM
<i>Douglas Collins</i>	<i>Kurt Petersen</i>
Hewlett-Packard	Transensory Devices
<i>Michael Deal</i>	<i>Dilip Rajdev</i>
AMI	Consultant
<i>A. Joshi</i>	<i>Lynn M. Roylance</i>
Lockheed	Hewlett-Packard
<i>Robert McDonald</i>	<i>Dixie Sinkovits</i>
Intel	Perkin-Elmer/PHI
<i>James McVittie</i>	<i>Robert L. Thornton</i>
Stanford University	Xerox
<i>Eugene Meieran</i>	
Intel	

### CONFERENCE CHAIRMAN

*Krishna Saraswat*  
Integrated Circuits Laboratory  
Department of Electrical Engineering  
Stanford University  
Stanford, California 94305  
(415) 497-2956

### REGISTRATION FORM - 1985 13th AIME ELECTRONIC MATERIALS SYMPOSIUM

Name: \_\_\_\_\_ Title: \_\_\_\_\_

Organization: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

City, State: \_\_\_\_\_ ZIP: \_\_\_\_\_

( ) Registration Fee      Before March 4, 1985      After March 4, 1985  
 ( ) Full-Time Registered Student      \$40      \$50      \$20

Make check payable to: "No. Cal. Met. Section, AIME", and send with the above information to:  
 Dr. James McVittie, Integrated Circuits Lab./McC 120, Stanford University, Stanford, CA 94305. (415) 497-1059. Do not send purchase orders. Please make sure your name and affiliation are clearly identified.