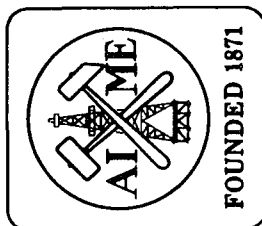
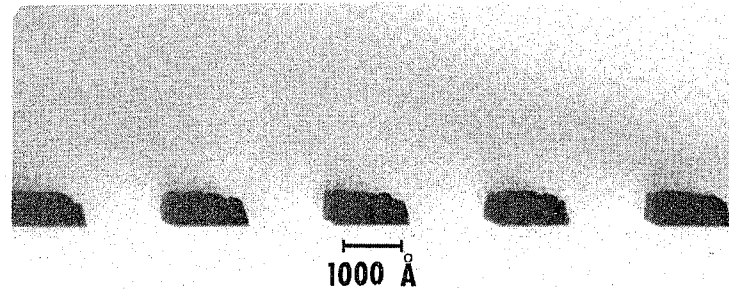


Non Profit  
 Organization  
 US Postage Paid  
 Los Altos, CA 94022  
 Permit No. 383

**METALLURGICAL  
 SOCIETY OF AIME**  
 THE NORTHERN CALIFORNIA METALLURGICAL SECTION



THE



The  
**NORTHERN CALIFORNIA  
 METALLURGICAL SECTION**  
 of  
**AIME**  
 presents  
**THE ELEVENTH 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 21, 1983  
 7:30 A.M.

**PROGRAM**

Monday, March 21, 1983

Marriott Hotel

\*\*\*\*\*

7:30 Registration

**MORNING SESSION**  
 (California Ballroom - Center)

Session Chairman: Dr. Douglas M. Collins  
 H-P Labs., Palo Alto, CA

8:30 **Welcoming Remarks and Introduction**  
 Dr. Robert C. McDonald  
 Intel Corporation, Santa Clara, CA

8:40 **"Evolution of High Speed Digital Device  
 Technology - Materials Issues."**  
 Dr. James C. McGroddy  
 IBM Research, Yorktown Hts., NY

9:30 **"Permeable-Base Transistor Technology."**  
 Dr. Carl Bozler  
 MIT-Lincoln Lab., Lexington, MA

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

10:50 **"Large Diameter Silicon Wafers for VLSI."**  
 Dr. Dieter Huber  
 Wacker-Chemitronic, Burghausen, Germany

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

12:20 **Ross Tucker Award**

12:30 **"Getting Out of the Recession."**  
 Mr. Don Hoeffler  
 Microelectronics News, Pacific Grove, CA

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

Session Chairman: Dr. Lynn Roynance  
 H-P Corp., Palo Alto, CA

1:30 **"VLSI Analytical Technique Overview."**  
 Dr. Noel MacDonald  
 Perkin-Elmer, Norwalk, CT

2:15 **"CMOS Material and Device Concerns."**  
 Dr. Lou Parillo  
 Bell Labs., Murray Hill, NJ

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

3:30 **"Thin Gate Dielectric Films."**  
 Dr. Hugh Grinolds  
 Hewlett-Packard Labs, Palo Alto, CA

4:15 **"Refractory Silicide Conductors."**  
 Dr. Francois D'Heurle  
 IBM Research, Yorktown Heights, NY

5:00 **HOSTED COCKTAIL PARTY**  
 Marriott Hotel  
 California Ballroom - Left

\*\*\*\*\*

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

8:00 - 5:00 Vendor's Exhibits

\*\*\*\*\*

**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 7, 1983, 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 7, 1983.

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

We are honored to have Mr. Don Hoeffler, editor of the Microelectronics News, as our luncheon speaker. There are few who know the details of Silicon Valley as does Mr. Hoeffler. He was featured in a recent edition of the National Geographic Magazine.

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 Robert C. McDonald, Intel Corporation, SC2-241, 3065 Bowers Avenue, Santa Clara, CA 95051. Telephone (408) 987-8692.

**ABOUT THE COVER**

Cross-section transmission electron micrograph of the tungsten grid of a permeable base transistor.

The tungsten stripes (dark areas) are approximately 1600 Å wide and 500 Å thick and are embedded in a single crystal of GaAs (light area). Photo courtesy of C. O. Bozler, MIT - Lincoln Laboratory.

### ABOUT THE SPEAKERS

**Dr. James C. McGroddy** is Vice President, Logic & Memory, of the IBM Research Division and the Director of the Semiconductor Science and Technology department at the Watson Research Center in Yorktown Heights, N. Y. He joined IBM in 1965 after completing a BS at St. Joseph's College and a PhD at the University of Maryland, both in Physics. He has done research on magneto-optical effects in metals, hot electrons, microwave instabilities and non-linear optics in semiconductors and on a variety of semiconductor devices, including injection lasers. In 1970-71, he was visiting professor at the Technical University of Denmark. In addition to his research work, which has led to over 30 papers and 10 patents, he has held a variety of technical management positions in the IBM Research Division. He is currently responsible for work ranging from fundamental research in semiconductors to advanced semiconductor and superconducting integrated circuit technologies. McGroddy is a Fellow of the American Physical Society and of the Institute of Electrical and Electronic Engineers (IEEE).

**Dr. Carl O. Bozler (M'72-SM'81)** was born in Columbus, Ohio on August 24, 1941. He received his B.E.E. and M.S. degrees in 1965, and his Ph.D. degree in 1969 from the Ohio State University, Columbus, Ohio. His thesis work concerned thin-film crystal growth of indium arsenide.

He continued his thesis work at F. W. Bell, Inc., and in 1971 he joined Sperry Rand Corporation where he worked on epitaxial growth of gallium arsenide and silicon, and on the design and fabrication of microwave devices. Since 1974, he has been with M.I.T. Lincoln Laboratory, Lexington, MA., doing research on epitaxial gallium arsenide, ion implantation, microwave devices, integrated optics and solar cells. In recent years his work has focused on the development of new high speed transistors for use in digital logic circuits. His publication on the permeable base transistor won the W.R.G. Baker Prize Award from the IEEE for the outstanding paper of 1981.

Dr. Bozler is a member of the IEEE and the Electrochemical Society.

**Dr. Diethard Huber** received his Diplom of Physics from the Technical University of Munich in 1969. In 1973 he finished there his thesis on the Metallurgy of III-V Compounds. From 1973 he worked in the Semiconductor Division of AEG-Telefunken in the fields of solar cells and of device process development. In 1977 he joined Wacker-Chemitronic, where he is responsible for materials and applications.

**Mr. Don Hoefler.** After starting life as an E.E., Don Hoefler switched to full time journalism in 1957, as a staff editor at Electronics Magazine in New York.

He migrated to the west coast in 1960, and in 1962 found himself as a Public Relations Consultant to Fairchild in the Bob Noyce era. It was there that he was first introduced to the wild and wonderful world of semiconductors.

After a brief sojourn in Los Angeles, he returned to the Bay area to discover the valley landscape teeming with companies headed by men whom he knew on a first name basis from his Fairchild days. Thus, he was able, very quickly, to beef up the semi-conductor coverage of Electronics News. He soon thereafter added the duties of columnist, with Manager's Casebook, which he still writes every week.

Overworked, underpaid and broke, he decided at the end of 1971 to make a desperate pass at starting his own business, something which he could finance on a shoestring. It took six months to get off the ground, but on July 1, 1972, was born Volume 1, Number 1, of Microelectronics News.

He has been muckraking ever since, and at mid-year will celebrate his 11th anniversary as the Rona Barrett of Silicon Valley.

**Dr. Noel C. MacDonald** received his Ph.D. in Electrical Engineering from the University of California at Berkeley in 1967, and was Assistant Professor there from 1967 to 1968. In 1980, he attended the Harvard University Business School Program for Management Development. Dr. MacDonald was on the staff at the Rockwell International Science Center from 1969 to 1970 and was a principal in Physical Electronics Industries, Inc., holding a number of technical and management positions from 1970 to 1977. From 1977 to 1980, he held management positions at the Physical Electronics Division of Perkin-Elmer Corporation, having the position of Division General Manager from 1979 to 1980. Since 1980, Dr. MacDonald has been Group Director of Marketing for the Semiconductor Equipment Group, Perkin-Elmer Corporation. In that position, he is responsible for technical marketing of lithography, plasma and electron beam semiconductor capital equipment.

Dr. MacDonald has specialized in electron beam technology, with emphasis on microelectronics applications, and has been instrumental in combining Auger Electron Spectroscopy with Scanning Electron Microscopy and the development of the Scanning Auger Microprobe. Dr. MacDonald received the 1973 Victor Macres Memorial Award "for outstanding contribution in instrumentation presented at the annual meeting" of the Electron Probe Analysis Society of America, and a 1975 Young Engineer of the Year Award presented by the Institute of Electrical and Electronic Engineers "for outstanding achievement in the engineering profession". His present interests include analyses of the future technologies and equipment requirements for the semiconductor and computer industries.

**Dr. Louis C. Parrillo** received the B.S.E.E. degree from the University of Connecticut, Storrs, CT, in 1964 and the M.S.E. and Ph.D. degrees in electrical engineering from Princeton University, Princeton, N.J., in 1967 and 1972, respectively.

Dr. Parrillo joined Bell Laboratories, Murray Hill, N.J. in 1971 as a member of the technical staff. Initially, he was involved in various aspects of high-performance bipolar IC technology development, including device and process design as well as IC yield improvement activities. More recently, he has been engaged in CMOS technology development. Currently, he is a group supervisor in the Silicon Processing Technology Laboratory in charge of advanced CMOS technology development for VLSI applications.

Dr. Parrillo has served several times on the Device Technology Sub-committee for the IEEE International Electron Device Meeting, and is a member of Eta Kappa Nu, Tau Beta Pi, Phi Kappa Phi and Sigma Xi.

**Dr. Hugh R. Grinolds** received his B.S., M.S. and Ph.D. degrees in electrical engineering from the University of Minnesota in 1974, 1976 and 1979 respectively. The thesis topics addressed for the graduate degrees dealt with the material and electrical properties of Schottky and ohmic contacts to Si and GaAs.

In 1976, he worked at Hewlett Packard Loveland Instrument Division as a summer student on software development for CAD tools. Upon graduation in 1979, he joined the Hewlett Packard Integrated Circuit Laboratory in Palo Alto, CA to work on process development and characterization of EEPROM memories and devices. He was also involved in the use of various refractory metals for silicide films in IC's. He is currently a project manager of a group at Hewlett Packard Laboratories investigating properties of thin dielectrics in MOS devices and IC technologies.

Dr. Grinolds is a member of the IEEE, the Electrochemical Society and the American Vacuum Society.

**Dr. Francois D'Heurle** received his undergraduate training in France during WWII. He came to the US in 1946 to pursue his graduate education. Most of his knowledge of materials was gathered while working as a part time assistant in the laboratory of C. S. Barrett at the Institute for the Study of Metals in Chicago. After getting his Ph.D. at the Illinois Institute of Technology under P. Gordon he joined IBM Research Center in 1958. For the last twenty years he has been involved in the study of metallic thin films. Before devoting his attention to the properties of silicides he did extensive work on electromigration.

### CONFERENCE COMMITTEE

<i>Douglas Collins</i>	<i>Dilip Rajdev</i>
Hewlett-Packard	Consultant
<i>Vince Marrello</i>	<i>Lynn Roylance</i>
IBM	Hewlett-Packard
<i>Eugene Meieran</i>	<i>Krishna Saraswat</i>
Intel	Stanford Univesity
<i>Aare Onton</i>	<i>Dixie Sinkovits</i>
IBM	Perkin-Elmer
<i>Kurt Petersen</i>	
Transensory Devices	

### CONFERENCE CHAIRMAN

*Robert McDonald*  
Intel Corporation, SC2-241  
3065 Bowers Avenue  
Santa Clara, CA 95051  
(408) 987-8692

### REGISTRATION FORM - 1983 11th AIME ELECTRONIC MATERIALS SYMPOSIUM

Name: \_\_\_\_\_ Title: \_\_\_\_\_  
 Organization: \_\_\_\_\_  
 Mailing Address: \_\_\_\_\_  
 City, State: \_\_\_\_\_ ZIP: \_\_\_\_\_

( ) Registration Fee	Before <u>March 7, 1983</u>	After <u>March 7, 1983</u>
( ) Full-Time Registered Student	\$35	\$45
	\$15	\$20

Make check payable to: "No. Cal. Met. Section, AIME", and send with the above information to: R. C. McDonald, Intel Corporation, MS 2-241, 3065 Bowers Ave, Santa Clara, CA 95051, (408)-987-8692. Do not send purchase orders. Please make sure your name and affiliation are clearly identified.