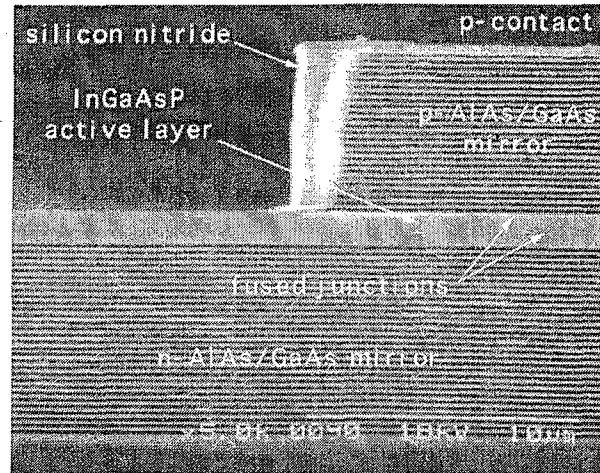


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The
NORTHERN CALIFORNIA
ELECTRONIC MATERIALS
SYMPOSIUM



The Twenty-Fifth Annual Northern California

Electronic Materials Symposium

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

Sunnyvale Hilton
1250 Lakeside Dr.
Sunnyvale, California

Monday
March 24, 1997
8:00 AM

PROGRAM

Monday, March 24, 1997
Sunnyvale Hilton

8:00 Registration

MORNING SESSION

Session Chair: Dr. Judy Glazer
Hewlett-Packard, Palo Alto, CA

8:30 **Welcome Remarks and Introduction**

Dr. Maximilian Biberger
Varian, Palo Alto, CA

8:40 **"Amorphous Silicon Image Sensor Arrays"**

Dr. Bob Street
Xerox, Palo Alto, CA

9:25 **"Gallium Nitride for Blue and Green Light
Emitting Devices"**

Dr. Steve DenBaars
UCSB, Santa Barbara, CA

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

10:40 **"Magnetic Tunnel Junctions, Science and
Technology"**

Dr. Stuart Parkin
IBM, San Jose, CA

11:30 **LUNCHEON**

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

12:25 **"Virtual Musical Instruments of Today"**

Prof. Julius Smith
Stanford University, Stanford, CA

AFTERNOON SESSION

Session Chair: Dr. Rick Schneider
Hewlett-Packard, Palo Alto, CA

1:30 **"Planarization of Si IC's"**

Dr. Mark Bohr
Intel, Hillsborough, OR

2:15 **"Physical Vapor Deposition for ULSI"**

Dr. Ron Powell
Varian, Palo Alto, CA

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

3:30 **"Novel Wafer Fused Optoelectronic Devices"**

Prof. John Bowers
UCSB, Santa Barbara, CA

4:15 **"The Thin CRT: Field Emission Displays"**

Roger Barton
Candescent, Mountain View, CA

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

Vendors 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 17, 1997, because of the lower cost of handling pre-registration 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-third 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. Maximilian Biberger, Varian Associates. Phone: 415-424-5194, email: max.biberger@tfs.varian.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

This is a cross sectional SEM micrograph of a double-fused vertical-cavity surface-emitting laser. The layers in this structure were grown using OMVPE and MBE on 2 GaAs wafers and 1 InP wafer then combined with wafer bonding to make a single unique laser structure. The device and photo are by Dubravko Babic

ABOUT THE SPEAKERS

Dr. Roger W. Barton has been with Candescent since June 1993. Prior to that he was a Visiting Professor at Stanford University, Dept. of Materials Science and Engineering and Director of Materials R&D at Conductus, a start-up dedicated to the commercialization of thin film high- T_c superconductors.

Mr. Mark T. Bohr received a B.S. in industrial engineering and a M.S. in electrical engineering from the University of Illinois. He joined Intel corporation in Portland, Oregon in 1978. He is a member of Portland Technology Development and has done process integration and device design on a variety of memory and logic technologies including recent 0.35 μm and 0.25 μm logic technologies used to make high performance Pentium® and Pentium Pro® microprocessors. He is Intel's Director of Process Architecture and Integration and an Intel Fellow. He has ten patents and has authored 16 publications.

Dr. John Bowers is a Professor of Electrical Engineering USSB. He is a Fellow, IEEE. Professor Bowers' research interests are in the development of novel optoelectronic devices for the next generation of optical networks. His research interests include novel ways of growing quantum wires and dots using MBE and MOCVD, techniques to fuse dissimilar materials together for new devices and improved performance, the design of quantum well structures for high speed light generation and detection, and the design of high speed time division multiplexed systems and devices. Prior to joining UCSB in 1987, Professor Bowers worked at AT&T Bell Laboratories. As a Research Associate at Stanford University, he worked on fiber optic sensors. Professor Bowers is a Co-Director of the UCSB Thunder and Lightning project on TDM networks, and is a member of the Optoelectronics Technology Center and the NSF Center on Quantized Electronic Structures (QUEST).

Dr. Steven P. DenBaars is an Associate Professor of Materials and Electrical Engineering at the University of California Santa Barbara. He received his Ph.D. degree in Electrical Engineering from the University of Southern California, in 1988 under the direction of Prof. P.D. Dapkus. From 1988-1991 Dr. DenBaars was a member of the technical staff at Hewlett-Packard's Optoelectronics Division involved in the growth and fabrication of visible LEDs. His current research interests are in metalorganic chemical vapor deposition (MOCVD) of III-V compound semiconductor materials and devices. Specific research interests include growth of wide-bandgap semiconductors (GaN based), and their application to Blue LEDs and lasers and high power electronic devices. In 1994 he received a NSF Young Investigator award. He has Authored or Co-Authored over 75 technical publications, 50 conference presentations.

Dr. Stuart Parkin received his BA degree (1977) and was elected a Research Fellow (1979), at Trinity College, Cambridge, and was awarded his PhD degree (1980) at The Cavendish Laboratory, Cambridge. Dr. Parkin joined IBM Research in San Jose as a World Trade Postdoctoral Fellow in 1982, becoming a permanent member of the staff the following year. Prior to coming to San Jose, Dr. Parkin was awarded a Royal Society European Exchange. At IBM, his interests have ranged from organic superconductors to ceramic high temperature superconductors and most recently the study of

magnetic thin-film structures and nano-structures. In 1991 Dr. Parkin discovered oscillations in the magnitude of the interlayer exchange coupling in transition metal magnetic multilayered systems. He was honored for this and related work with the 1994 American Physical Society International New Materials Prize. Dr. Parkin is a Fellow of the American Physical Society.

Dr. Ron Powell received his Ph.D. in physics from Stanford University. After that Dr. Powell remained as a Senior Research Associate to pursue research on semiconductor surfaces using electron and x-ray spectroscopy. He joined Varian Associates in 1979 and presently serves as a Director of the Varian Research Center in Palo Alto, CA in charge of programs on advanced semiconductor process technology and IC fabrication equipment. Current R&D projects include the exploration of plasma-based ion implantation for ultrashallow junction formation, sputter deposition (PVD) of thin films for multilevel metal interconnection using both conventional and ionized PVD methods, chemical vapor deposition (CVD) of metals and high dielectric constant oxides. Dr. Powell has over 70 technical publications and 6 patents in these areas and has edited several books. He is past president of the American Vacuum Society (AVS) chapter in Northern California and from 1984-90 served as secretary of the Electronic Materials and Processing Division of the AVS. He recently served as Associate Editor of the Journal of Vacuum Science and Technology.

Dr. Julius O. Smith began his signal processing career with a B.S./E.E. degree (in Circuits, Communication, and Control) from Rice University in 1975, where he learned DSP from Sid Burrus, J.B. Pearson, and Tom Parks. From 1975 to 1977 he worked in the Signal Processing Dept. of the Electromagnetic Systems Laboratories in Sunnyvale on digital communications systems. He received the Ph.D./E.E. degree from Stanford University in 1983. From 1983 to 1992, he was a part-time Research Associate at the Center for Computer Research in Music and Acoustics (CCRMA) at Stanford University. From 1986 to 1992, he was a Software Engineer and group manager at NeXT Inc. He is now an Associate Professor at CCRMA, where he teaches three signal processing courses, and pursues research into music applications of signal processing. Prof. Smith's publications have appeared principally in the Computer Music Journal and various transactions of the IEEE.

Dr. Robert Street studied physics at Cambridge University, receiving his BA degree in 1968 and Ph.D. in 1971. He then took up a post-doctoral fellowship at Sheffield University and in 1974 became a visiting scientist at the Max Planck Institute in Stuttgart, where he studied the photoluminescence of semiconductors. In 1976 he came to the Xerox Palo Alto Research Center and is presently a Senior Research Fellow. His research has concentrated on the material and device properties of hydrogenated amorphous silicon. In 1992 he was awarded the American Physical Society David Adler Lectureship Award.

1997- The Twenty-Third Annual Ross Tucker Award Recipients

Shawming Ma
Materials Sci. & Eng. Dept.,
Stanford University
*"Characterization of Plasma Processing Induced
Charging Damage to MOS Devices"*

Chris Keller
Materials Sci. Dept.,
University of California at Berkeley
*"High Aspect Ratio Molded Polysilicon for
MicroElectroMechanical Systems"*

Symposium Committee

| | | |
|---------------------------------------|--------------------------------|------------------------------------|
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| <i>Melisa Buie</i> Appl. Materials | <i>Bill Imler</i> HP | <i>Irfan Saadat</i> National |
| <i>Kent Carey</i> HP | <i>Roya Maboudian</i> UCB | <i>Rick Schneider</i> HP |
| <i>Dave Fork</i> Xerox | <i>Bob Miller</i> IBM | <i>Xu Zheng</i> Appl. Materials |
| | <i>Fernando Ponce</i> Xerox | |

Symposium Chair

Maximilian Biberger
Varian, Palo Alto, CA

Symposium Sponsors

Northern California Section of TMS
IEEE Electron Device Society, Santa Clara
Valley Chapter

REGISTRATION FORM - 25TH ANNUAL ELECTRONIC MATERIALS SYMPOSIUM (1997)

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Symposium Date: March 24, 1997 Registration Fee: _____ Pre-registration by March 17, 1997

Regular Registration (please circle) \$85 \$70
 Full-Time Registered Student \$35 \$20

Make checks payable to: Electronics Materials Symposium and send with the above information to: 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: ellallen@email.sjsu.edu. Do not send purchase orders. The Tax ID for the Symposium is: 25-1484913. Please make sure your name and affiliation are clearly identified. Cancellation: All registrations are transferable but not refundable. No confirmation of registration will be sent.