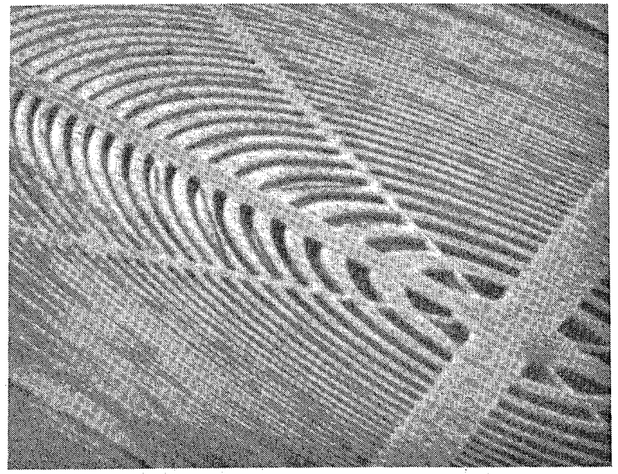
The
NORTHERN CALIFORNIA
ELECTRONIC MATERIALS SYMPOSIUM

IEEE

TMS
Minerals • Metals • Materials



X-ray Phase Lens for operation at $Al_{K_\alpha} \approx 1.5\,keV$

THE 20th ANNUAL

ELECTRONIC MATERIALS SYMPOSIUM

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

LE BARON HOTEL

1350 N. FIRST STREET

SAN JOSE, CALIFORNIA

Monday

March 23, 1992

7:30 AM

PROGRAM

Monday, March 23, 1992

Le Baron Hotel

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7:30 Registration

MORNING SESSION (Fiesta Ballroom)

Session Chair: Dr. Jerry Hurst
IBM
San Jose, CA

8:30 **Welcoming Remarks and Introduction**
Dr. David Kyser
Advanced Micro Devices, Sunnyvale, CA

8:40 **"Chemical Mechanical Polishing Processes and Semiconductor Applications"**
William Patrick
IBM General Technology Division, Hopewell Junction, NY

9:25 **"Key Developments Leading to Wide Band Gap II-VI Laser Diodes"**
Dr. Michael Haase
3M, St. Paul, MN

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

10:40 **"Magnetoresistive Head Technology: Thin Film Issues"**
Dr. J. Kent Howard
IBM Storage Systems Product Division, San Jose, CA

11:30 **LUNCHEON**

12:15 **The eighteenth annual Ross Tucker Award**

12:25 **Ceremony for the 20th anniversary of the EMS**

12:35 **"The PC: 10 Years and Counting"**
Bill Machrone
Ziff-Davis Publishing Company, New York, NY

AFTERNOON SESSION (Fiesta Ballroom)

Session Chair: Dr. Robert Thornton
Xerox PARC
Palo Alto, CA

1:30 **"Void Growth and Failure of Passivated Metal Lines under Stress and Electromigration Conditions"**
Prof. William Nix
Stanford University, Stanford, CA

2:15 **"Electromigration in Controlled Microstructures"**
Prof. Carl Thompson
MIT, Cambridge, MA

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

3:30 **"Advanced X-Ray Optics for Soft X-Ray Projection Lithography"**
Dr. Andrew Hawryluk
Lawrence Livermore National Laboratory, Livermore, CA

4:15 **"Active Matrix Flat Panel Display Technology"**
Dr. Malcolm Thompson
Xerox PARC, Palo Alto, CA

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 16, 1992 because of the lower cost of handling pre-registration 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 16, 1992.

During the Symposium, the eighteenth annual Ross N. Tucker Memorial Awards will be presented to two Bay Area students in recognition of excellence in research. There will also be a short ceremony recognizing the 20th anniversary of the **Electronic Materials Symposium.**

We are honored to have Bill Machrone of Ziff-Davis Publishing as our luncheon speaker. For several years Mr. Machrone was Editor-in-Chief of *PC Magazine*. He is currently the Publishing Director of *PC Magazine* and Vice-President for Technology at Ziff-Davis Publishing where he is responsible for the Ziff-Davis Labs. He will review some of the history of the PC and discuss where he sees the industry headed.

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 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 Dr. David Kyser, Advanced Micro Devices, P.O. Box 3453, Sunnyvale, CA 94088. (408) 749-2071.

ABOUT THE COVER

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Pictured is a silver x-ray phase lens for operation at
$Al_{K_\alpha} \approx 1.5$ keV. The thickness is 0.65 μm and $\Delta R \approx 3000$ Å.
(Photo courtesy of Dr. Andrew Hawryluk,
Lawrence Livermore National Laboratory)
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ABOUT THE SPEAKERS

Dr. Michael Haase is currently involved with research and development of short wavelength II-VI light emitters at 3M. He received his B.S. and M.S. degrees in Electrical Engineering from the University of Illinois in Urbana-Champaign. He continued there, earning his Ph.D. in 1988 after developing an internal photoemission technique for measuring band offsets in semiconductor heterostructures. After graduate school he joined 3M where, in addition to research on novel guided-wave devices in the III-Vs, he was in charge of device development for the wide band gap II-VI group. This work lead to the world's first blue-green laser diodes, as well as blue LEDs and electro-optic modulators. Michael is a member of the IEEE and APS, and has co-authored over 30 technical publications.

Dr. Andrew Hawryluk is a Senior Research Scientist in the Advanced X-Ray Optics Program at the Lawrence Livermore National Laboratory. Dr. Hawryluk received his B.S. and M.S. degrees from MIT in the Department of Electrical Engineering and Computer Science and his Ph.D. degree from MIT in 1981 while developing x-ray proximity print lithography and transmission x-ray optics. In 1983, Dr. Hawryluk joined LLNL's Advanced X-Ray Optics Program where he applied microfabrication technologies for the control, generation and manipulation of x-rays. His work included the development of x-ray gratings, zone plates, lasers and mirrors. Since 1988, Dr. Hawryluk has been applying these newly developed x-ray technologies for soft x-ray projection lithography. Dr. Hawryluk has published over 40 papers in the fields of x-ray optics, microfabrication technologies and lithography, currently holds 13 patents and is the recipient of 5 R&D 100 Awards and the Department of Energy's Award of Excellence.

Dr. J. Kent Howard is an IBM Fellow in the Storage Systems Line of Business in San Jose, CA. He has worked for approximately 30 years in various areas of materials science, spending 21 years in semiconductor material and the last 10 years in storage materials. Recently, he has been involved in the invention of materials systems used in both MR head and the film disk and in the transfer of this technology from research to development. Howard joined the Research Division of Texas Instruments in 1980 and worked on epitaxial growth and perfection of Si and GaAs films. He joined IBM in 1965 and spent the majority of his career on interconnection metallurgy issues. His key technical accomplishments include approximately 60 publications, 2 book chapters, and a critical review of magnetic thin films. He is also the inventor or co-inventor of 40 filed patents and has received numerous IBM awards.

Bill Machrone Has been in charge of the overall editorial direction of *PC Magazine* for the past eight years. From October 1987 through August 1989 he also served as the Publisher, and is now Publishing Director. Now as the Vice President for Technology for the Ziff-Davis Publishing Company, Bill is responsible for the Ziff-Davis Labs and how it interfaces with all of the Ziff-Davis publications around the world. Prior to joining *PC Magazine*, Bill was a partner in firm which specialized in turn-key systems for personnel and sales management and was contributing editor to *MicroSystems* magazine. He came to the microcomputer business from Information Science, Inc., a software company specializing in personnel and payroll systems.

Prof. William Nix obtained his B.S. degree in Metallurgical Engineering from San Jose State College, and his M.S. and Ph.D. degrees in Metallurigical Engineering and Materials Science, respectively, from Stanford University. He joined the faculty at Stanford in 1963. He has received numerous awards for his excellent research and teaching in the field of metallurgy. He was named Chairman of the Department of Materials Science and Engineering in 1991. Professor Nix is engaged in research on the mechanical properties of solids. He is principally concerned with the relation between structure and mechanical properties of materials in both thin film and bulk form. He is co-author of about 225 publications in these and related fields. Professor Nix teaches courses on dislocation theory and mechanical properties of materials. He is co-author of "The Principles of Engineering Materials," published in 1973 by Prentice-Hall, Incorporated.

William Patrick is a Senior Engineer in the Insulator Technology Development Department at the East Fishkill Facility. He has been involved with the chemical-mechanical polishing development effort since its inception in 1983. Mr Patrick received his MS degree in physics from Syracuse University in 1964, and a BS degree in physics from Manhattan College. Mr Patrick is a member of the Electrochemical Society.

Prof. Carl Thompson received his S.B. in Materials Science and Engineering from MIT in 1976. He received his S.M. and Ph.D. degrees in Applied Physics from Harvard University in 1977 and 1982, respectively. He joined the faculty of the Department of Materials Science and Engineering at MIT in 1983. He spent the 1990-91 academic year at the University of Cambridge Department of Materials Science and Metallurgy, where he was awarded a United Kingdom Science and Engineering Research Council Visiting Fellowship. His research interests have been primarily focused on experimental and theoretical studies of microstructural evolution in thin films. Prof. Thomspon has authored or co-authored over 100 technical articles.

Dr. Malcolm Thompson obtained his B.Sc. and Ph.D. in Applied Physics in the U.K., where he first went to work for the Ministry of Technology working on thin film materials for infrared devices. He then became a Research Fellow in the Department of Electronic and Electrical Engineering at the University of Sheffield where he studied amorphous semiconductor materials and crystalline III-V compounds. After spending a sabbatical year at the Xerox Palo Alto Research Center, he joined them as a Member of the Research Staff in 1982. There, he continued his work on thin film technology, and devices for product applications in scanning, printing and displays. Currently, he is Manager of the Electronic and Imaging Laboratory at PARC, which has about 80 people working on materials and devices for scanners, printers and flat panel displays, and other large area electronics applications. He was responsible for establishing a large area amorphous silicon manufacturing facility in Japan. He has published over 100 scientific papers, has contributed to several books, and holds several patents in the areas of thin film devices and their applications. He has received several awards for technology innovation and management and in 1989 he was given the Xerox President's Award for his work in this area.

1992 Ross Tucker Award Recipients

(two awards to be announced this year)

SYMPOSIUM COMMITTEE

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REGISTRATION FORM - 20th ANNUAL ELECTRONIC MATERIALS SYMPOSIUM (1992)

Name: Title:

Organization: Mailstop:

Mailing Address:

City, State: ZIP:

Symposium Date: **March 23,1992**	Registration Fee	Pre-registration by March 16, 1992
Regular Registration (please circle)	$75	$55
Full-Time Registered Student	$40	$20

Make check payble to: **Electronic Materials Symposium** and send the above information to: Dr. David F. Kyser, Advanced Micro Devices, M/S-79, P.O. Box 3453, Sunnyvale, CA 94088-3453, (408) 749-2071. 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.