#### 1973-1993

### As the Presidents See It...

### Excitement, Exhilaration, and Exhaustion R.P.H. Chang, 1989 MRS President

Being an MRS president during a phase of rapid growth in the Society was an experience I could afford only once in my life. I can only describe it as a combination of three Es: exciting, exhilarating, and exhausting. Out of the seven days in my "workweek," four were dedicated to MRS business.

In 1989, the Society was challenged by several major issues: (1) providing MRS with more visibility and recognition, (2) enhancing our role in the leadership of national materials policy and our service to the materials community at large, (3) internationalizing the MRS concept and organizing an MRS world body, and (4) determining whether the rapid growth of the Society would be detrimental to its financial stability.

To meet the first challenge—assuring that the exciting activities of MRS were reported by the major wire services and other media—the Society hired David Sours to work on publicity. Together with an outside consultant and members of the Public Relations and Publicity Committee, which was then chaired by June Passaretti, MRS launched a dedicated effort aimed at promoting and publicizing its activities. The seeds they planted four years ago are certainly bearing fruit today. Now, when MRS calls, reporters listen and respond quite a change from the "old days"!

To be considered seriously as a leader among the national materials research societies, I felt it was inevitable for MRS to be present in Washington. After a concerted effort among the External Affairs Committee (then chaired by Kathy Taylor), the Executive Committee, and the Council, the Society established an office in Washington. Elton Kaufmann contributed significantly toward finding the office and the personnel to manage it. The important decision we made in 1989 marked the beginning of our serious commitment to the service of our nation.

Since 1985, with my appointment as the Chair of MRS International Relations, I have been working steadily with other MRS colleagues to develop an international network of MRS societies. We started by organizing international conferences, such as the International Conference on Advanced Materials (ICAM) and the International Conference on Electronic Materials (ICEM), which rotate to various locations around the world. Through close interaction with our international colleagues worldwide, we have encouraged the establishment of many MRS societies around the globe. During this process I had to learn quickly how to be a good diplomat and how to coordinate what sometimes seemed to be impossible tasks.

In the fall of 1990, with the cooperation and support of all of our international colleagues, we were able to establish the International Union of Materials Research Societies (IUMRS). Many MRS members contributed to this success, but it was the MRS Council and the Executive Committee who gave me the encouragement, trust, and support to carry on with the mission. The involvement of MRS in IUMRS has just started.

An important financial decision the Society faced during the 1988–1989 period was whether to increase the number of pages in the *Journal of Materials Research*, and the frequency of its publication from six to 12 times a year. The Society made an expensive decision then; today *JMR* has become a premier international materials journal.

Countless other MRS activities claimed my attention during 1989, but I would like to mention one in particular. I had the honor of picking the design of the MRS lapel pin we all proudly wear today.

In summary, among the many MRS advancements I was fortunate to be involved with, what I really enjoyed most was the friendship I developed with MRS colleagues around the world. The success of MRS lies in the fact that the Society is willing to support volunteers with good ideas for the enrichment of MRS and the materials community worldwide. I certainly hope that all future MRS leaders continue this fine tradition.

**Bob Chang** is a professor in the Department of Materials Science and Engineering at Northwestern University.

### MRS: Growing Up John Baglin, 1988 MRS President

For some MRS members, 1988 will be remembered for the incredible Spring Meeting in Reno, where the slot machines and the tables at the garishly ornate Bally's Grand Hotel competed with technical sessions for the attention of materials scholars; where the meeting included an exhibit of "natural" art ("MicroScapes") consisting of spectacular materials micrographs (courtesy of AT&T); and where expert guides were needed if you wanted to find the Equipment Show (you could be photographed with the MGM lion on the way!).

Since that time, our Spring Meeting has nearly trebled in size, and we have moved to the spacious San Francisco Marriott. We haven't had any more art shows, but we continue to experiment with new ingredients to enrich our meetings, including forums, workshops and late news sessions-without losing the focus on high-quality, well-coordinated technical symposia. In 1988, MRS was in fact facing the joys and growing pains of its adolescence. The Society at that time was entering a period of growth and transition: building a strong foundation for its approaching adulthood while exploring new ideas, learning quickly by experience what works well for us, and grappling with the dynamic growth of meetings, membership, budget and aspirations, while trying to preserve the suppleness and adventurous spirit inherited from our youthful years. Throughout the subsequent period of evolution and growth, MRS has remained justifiably confident in the validity of its primary mission: to facilitate and stimulate interactions within the materials research community.

What were some of the issues and events of 1988 that best represented that time of growing-up and preparation for an ambitious future?

• Predicting the growth of both the Boston and West Coast meetings, we examined alternative formats and logistics, and negotiated hotel contracts through the next decade.

■ MRS took over production of the *Journal* of *Materials Research* from AIP, and *JMR* grew rapidly and stably, showing every sign, as we all hoped, of attaining high stature. (We did not suspect then how this expansion in *JMR*'s page load would come to threaten the financial stability of the Journal in later years—another learning experience that we have survived.)

• We celebrated publication of Volume 100 of the MRS Proceedings series (we are now moving beyond Volume 300).

 MRS membership rose by 20%, to 8,000.
 Materials societies fashioned on the MRS model and established or proposed in Europe, Japan, China, India, Australia, Mexico, and other countries, together with MRS, established the International Materials Research Committee, forerunner of today's International Union of Materials Research Societies. The first International



An interdisciplinary journal affiliated with the Materials Research Society

# MATERIALS LETTERS



Devoted to the rapid publication of short communications on the science, applications and processing of materials

# Covering Materials Science in its broadest sense

Materials Letters is an interdisciplinary journal devoted to the rapid publication of letter type papers. The scope of the journal covers the area of materials science in its broadest sense, ranging from solid state physics to materials technology. Important topics include:

- Preparation and Characterization of Materials
- High-Tc Superconductivity
- Preparation, Characterization and Physics of Semiconductors
- Thin Films
- Physical Metallurgy, Mechanical Properties, Ceramics and Composites.

Materials Letters has been affiliated with the Materials Research Society since the early years of the journal, and a significant number of the editorial board members are MRS representatives.

### Subscription Information:

1993: Volumes 15-18 (in 24 issues) Price: US\$ 887.00 / Dfl. 1552.00 including postage and handling costs ISSN 0167-577X

### Elsevier Science Publishers BV

P.O. Box 103, 1000 AC Amsterdam The Netherlands Tel: (31) 20 5862 819 Fax: (31) 20 5862 580

### In USA/Canada

**Elsevier Science Publishers** Journals Information Center 655 Avenue of the Americas New York, NY 10010, USA Tel (212) 633 3950 Fax: (212) 633 3764



### **Principal Editors:**

**J.H. Wernick,** AT&T Bell Laboratories, Murray Hill, USA

### A.F.W. Willoughby,

The University of Southampton, Southampton, UK

### For:

- Materials scientists
- Metallurgists
- Solid state chemists
- Physicists

The Dutch Guiler (Dfl.) price is definitive. US \$ is subject to exchange rate fluctuations. Customers in the European Community should add the appropriate VAT rate applicable in their country to the price(s).

Visit our booth during the MRS spring meeting and pick up your free sample copy

Please visit Booth No. 206-208 at the MRS Equipment Exhibit in San Francisco, April 13-15, 1993.

Circle No. 45 on Reader Service Card.

#### 1973-1993

MRS Meeting on Advanced Materials, held in Tokyo, was a signal of success.

The *MRS Bulletin* expanded its topical coverage and began monthly publication.
 The future role of MRS in the making of public policy was debated, along with proposals to establish a Washington office (which now exists).

• Additions to the MRS Awards program were discussed. In subsequent years, today's coherent array of awards was developed, and its evolution continues.

To meet the increases in membership, meeting size, MRS budget, and MRS volunteer activity, headquarters appointed a meetings director and a marketing specialist, and began to seek expanded office space. A new HQ computer was funded.
 A celebration at HQ (attended by Ernie Hawke, founding "MRS Secretariat") marked the fifth anniversary of John Ballance's appointment as executive director and his initiation of the Pittsburgh office, with Anne Wagner as administrative assistant.

• The MRS Constitution and By-Laws were extensively revised to reflect the current needs of the growing Society.

A weekend retreat was held for the Executive Committee to review major planning issues for the future of MRS. It had become clear that MRS growth demanded new definitions for the support and administrative roles of the headquarters office and for the volunteers, i.e., the Officers, Councillors, Committee members, meeting planners, etc. Planning was begun to enable HQ to offer a more secure basis of support and continuity into the future, while avoiding the pitfalls of a stifling bureaucracy. (The clearest evidence of the success of this transition has been the recent and smooth transfer of the budget-forming responsibility from the Treasurer to headquarters.) Related changes have steadily enabled HQ and the Executive Committee to relieve the Council of operational decisions, allowing Council to focus more on major issues of policy and direction.

The need for a comprehensive, articulated long-range plan for MRS became evi-

Views on MRS and materials research from former MRS presidents

dent, and work began that year, leading ultimately to the "MRS-2000, Positioning and Goals" document (1990) and, subsequently, to the 10-Year Action Plan of record. These plans envision a healthy, vigorous, member-driven MRS for the future, exploiting new ideas and new technologies to enhance our meetings, our publications, and our interactions with the educational and legislative communities.

The vitality of MRS rests primarily in the hands of its members. With such energy and enthusiasm as they have always provided, we can achieve nearly anything. It was a great privilege to preside for a year over such a dynamic organization; but it is the myriad MRS activists who, because of their continuing efforts, deserve credit for the enviable prosperity of MRS today. That, in my view, is just the way it should be. MRS is now well-equipped to support the kind of continuing growth and diversity that have distinguished its first 20 years. I have no doubt that the dynamic ongoing involvement of MRS members will assure its future success.

John Baglin is a research manager at IBM Almaden Research Center.

# Ultra Micro Indentation of Materials UMIS – 2000

### Measurement and analysis of the mechanical properties of

- Metals
- Ceramics
- Polymers
- Thin films
- Powders
- Surface-modified materials

**Determination of** 

- Hardness
- Modulus
- Stress-strain response
- Fracture toughness
- Creep properties





Division of Applied Physics National Measurement Laboratory

> PO Box 218, Lindfield NSW Australia 2070

Telephone: 61–2–413 7211 Facsimile: 61–2–413 7161

Computer-controlled data acquisition, analysis and simulation of pointed (Berkovich and Knoop) and spherical indenters. Load range from mg to 1 kg.

Please visit Booth No. 418 at the MRS Equipment Exhibit in San Francisco, April 13-15, 1993.

### EQUIPMENT EXHIBIT

### San Francisco Marriott Hotel Yerba Buena Room Tuesday-Thursday - April 13-15, 1993

As part of the **1993 MRS Spring Meeting**, a major equipment exhibit will be held to display analytical and processing equipment closely paralleling the nature of the technical symposia. The technical program has been arranged to allow meeting participants ample opportunity to visit the exhibit.

#### **Exhibit Hours**

Tuesday.noon - 5:30 p.m.Reception.7:30 p.m. - 9:00 p.m.Wednesday.9:30 a.m. - 5:00 p.m.Thursday.9:30 a.m. - 2:00 p.m.Coffee will be available during morning and afternoon<br/>breaks in the Equipment Exhibit area, Tuesday after-<br/>noon through Thursday morning.

### Partial List of 1993 Spring Equipment Exhibitors

Academic Press, Inc. Advanced Technology Materials, Inc. Aixtron. Inc. American Institute of Physics Anatech, Ltd. APD Cryogenics Inc. **Applied Science &** Technology, Inc. **Biosym Technologies** Blake Industries, Inc. Butterworth-Heinemann **CSIRO** Division of Applied Physics **DCA Instruments** Denton Vacuum, Inc. Duniway Stockroom Corp. **Elsevier Science Publishing** Company, Inc. **Emcore Corporation** FPI **Charles Evans & Associates FEI Company** E.A. Fischione Instruments, Inc. **Fisons Instruments** 

E. Fjeld Co. Inc. Gatan, Inc. Granville-Phillips Company Huntington Laboratories **IBM Analytical Services** Intevac MBE Ion Tech, Inc. **IOP** Publishing JEOL U.S.A., Inc. **Keithley Instruments** Kluwer Academic Publishers **Kratos Analytical** Lake Shore Cryotronics Kurt J. Lesker Company MDC Vacuum Products Corp. Micro Photonics Inc. **MMR** Technologies Molecular Simulations Inc. Nano Instruments, Inc. National Electrostatics Corporation Nor-Cal Products, Inc. North Eastern Analytical Corporation **Omicron Associates** Peabody Scientific Instruments

Ted Pella, Inc. Pergamon Press, Inc. Perkin-Elmer Corporation Philips Electronic Instrument Co. Plasma-Therm I.P., Inc. Publishers Display Group, Inc. Pure Tech Inc. Quad Group, Inc. Quantum Design, Inc. Radiant Technologies, Inc. Research and PVD Materials Corp. Semicaps South Bay Technology, Inc. STAIB Instrumente GmbH Structure Probe/SPI Supplies Superior Vacuum Technology Surface/Interface Inc. **Technical Instrument Company Tencor Instruments** Thermionics Laboratory Inc. **TopoMetrix** VAT. Inc. VCR Group, Inc. Virginia Semiconductor, Inc. Voltaix, Inc.

Companies interested in exhibiting may contact: Bob Finnegan, MRS Equipment Exhibit Manager American Institute of Physics 335 East 45th Street, New York, NY 10017 Telephone (212) 661-9404 • Fax (212) 661-2036

SEE AD IN THIS ISSUE

## It's not too late to register for the MRS 1993 SPRING MEETING April 12-16, 1993

San Francisco, California

To take advantage of special preregistration fees (see below), register by Friday, April 2, 1993.

If you or your colleagues have not received your copy of the 1993 Spring Program & Registration Materials book, call the MRS Meetings Department, (412) 367-3003.

### TECHNICAL PROGRAM

- A: Amorphous Silicon Technology 1993
- B: Silicon-Based Optoelectronic Materials
- C1: II-VI Compound Semiconductor Photovoltaic Technology
- C2: Infrared Detectors Materials, Processing and Devices
- D1: III-V Electronic and Photonic Device Fabrication and Performance
- D2: Low-Temperature-Grown and Highly Non-Stoichiometric GaAs and Related Materials
- E: Rare-Earth Doped Semiconductors
- F: Semiconductors for Room-Temperature Radiation Detector Applications
- G: Rapid Thermal and Integrated Processing
- H: Polymer/Inorganic Interfaces
- I: High-Performance Polymers and Polymer Matrix Composites
- J: Organic Materials for Nonlinear Optical Applications
- K: Materials Aspects of X-Ray Lithography
- L: Applications of Synchrotron Radiation Techniques to Materials Science
- M1: Thin Films Stresses and Mechanical Properties IV
- M2: Materials Reliability in Microelectronics III
- N: Ferroelectric Thin Films III
- O: Phase Transformations in Thin Films Thermodynamics and Kinetics
- P: Common Themes and Mechanisms of Epitaxial Growth
- Q1: Magnetic Ultrathin Films, Multilayers and Surfaces
- Q2: Magnetic Interfaces Physics and Characterization
- R: Joining and Adhesion of Advanced Inorganic Materials
- S: Fullerenes and Related Materials
- T: Materials Issues in High-Temperature Superconductivity
- U: Mechanisms of Deformation and Failure in Rocks and Ceramics
- V: Hydroxyapatite and Related Compounds
- W: Theory of Materials Properties
- X: Frontiers of Materials Research
- Y: Surface Chemical Cleaning and Passivation for Semiconductor Processing

- New Materials Development
- New Characterization Methods
- New Process Technology

### SPECIAL ACTIVITIES

- Plenary Speaker: Craig Barrett, Chief Operating Officer, Intel Corp. Tuesday, April 13, 6:00 p.m.
- Materials Manufacturing Forum Thursday, April 15, noon to 2:00 p.m.

Featuring speakers from government, industry, and national laboratories who will present the problems and progress they have encountered in their efforts to augment productivity in the manufacturing arena. An audience-wide discussion will follow.

Grass Roots Education Session

Monday, April 12, noon to 1:30 p.m.

Representatives of two highly successful K-12 programs will demonstrate hands-on activities which scientists or teachers can do with students to increase their interest in and understanding of science. Posters will be presented on Monday, April 12, at 8:00 p.m., by various groups involved in K-12 science education outreach activities.

### SYMPOSIUM AIDE OPPORTUNITIES

Graduate students who plan to attend the MRS Spring Meeting and are willing to assist in the symposium presentations can earn a waiver of the student registration fee and MRS student half-year membership by applying for Symposium Aide positions.

### EQUIPMENT EXHIBIT

A major exhibit of the latest analytical and processing equipment which closely parallels the nature of the technical symposia will be located in the Yerba Buena Ballroom, San Francisco Marriott Hotel, convenient to the technical session rooms. For show booth information, contact: Bob Finnegan, MRS Show Manager, American Institute of Physics, 335 East 45th Street, New York, NY 10017; Telephone (212) 661-9404; FAX (212) 661-2036

### SHORT COURSE PROGRAM

Courses on advanced materials characterization, preparation, and processing/diagnostic techniques have been designed for scientists, engineers, managers, and technical staff who wish to update their knowledge and skills in the research, development and processing of materials. These up-to-date courses are at the forefront of science and technology and complement Spring Meeting symposia. Class sizes are limited. Early preregistration is encouraged.

### PROCEEDINGS

Many of the MRS symposia will be publishing proceedings. For a complete list of MRS publications and prices, contact Materials Research Society, Publications Department, 9800 McKnight Road, Pittsburgh, PA 15237; Telephone (412) 367-3012; FAX (412) 367-4373

### PREREGISTRATION

Preregister by telephone, (412) 367-3003, or FAX (412) 367-4373, with your VISA, MasterCard, Diners Club, or AmEx card. Ask for Meeting Registration and your preregistration will be completed for you. Telephone preregistrations are accepted between 8:00 a.m. and 5:00 p.m. EST, Monday through Friday. Confirmations will be mailed within 10 working days.

- Preregistration Fees (through April 2, 1993)
- \$240 Members \$275 Nonmembers
- \$65 Student Members
  \$75 Student Nonmembers



### Materials Research Society

9800 McKnight Road, Pittsburgh, PA 15237 Telephone (412) 367-3003; FAX (412) 367-4373

# OXFORD UNIVERSITY PRESS

### Variational Methods in Mechanics

### TOSHIO MURA AND TATSUHITO KOYA

The methods detailed in this textbook have made possible the recent success and popularity of the finite-element method, crucial to solving mathematical problems in many branches of engineering today.

1992 256 pp.; 73 illus.; \$39.95

#### Chemical Change in Deforming Materials BRIAN BAYLY

This book is the first to detail the chemical changes that occur in deforming materials subjected to unequal compressions. Oxford Monographs on Geology and Geophysics 21 1993 256 pp.; 94 illus; \$75.00

### Atomic and Molecular Beam Methods

### Volume 2

EDITED BY GIACINTO SCOLES This second volume of an advanced handbook on experimental molecular beam methods covers beam spectroscopy and surface scattering, stressing both applied and theoretical issues. 1992 552 pp.; 278 illus.; \$125.00

### Quasicrystals

### A Primer

#### C. JANOT

This primer provides a descriptive approach to the subject of quasicrystals for those coming to it for the first time. Monographs on the Physics and Chemistry of Materials 48 1992 336 pp.; 206 illus.; \$65.00

# The Mechanics of Crystals and Textured Polycrystals

### WILLIAM F. HOSFORD

This text is an introduction to crystal mechanics and includes theories of polycrystalline and continuum plasticity for textured materials.

Oxford Engineering Science Series 32 March 1993 224 pp.; 176 illus.; \$49.95

### Mechanisms of Conventional and High Tc Superconductivity

VLADIMIR Z. KRESIN, HANS MORAWITZ, AND STUART A. WOLF This book describes the methods, established results, and recent advances in the field of superconductivity. International Series of Monographs on Physics 84 May 1993 208 pp.; 30 illus.; \$40.00

### **Images of Materials**

# EDITED BY DAVID B. WILLIAMS, ALAN R. PELTON, AND RONALD GRONSKY

"Exceptional. . .[describes] several types and techiques of microscopy that are the basis of modern microstructural analysis in materials science. . . . This book indeed provides a delightful view into the world of materials." —*Science* 1992 432 pp.; 410 illus., 78 color plates; \$75.00

### Introduction to Scanning Tunneling Microscopy C. JULIAN CHEN

This book provides a comprehensive treatment of scanning tunneling and atomic force microscopy, with full coverage of the imaging mechanism, instrumentation, and sample applications. *Oxford Series on Optical and Imaging Sciences 4* February 1993 448 pp.; 215 illus.; \$65.00

### Acoustic Microscopy

#### **ANDREW BRIGGS**

This practical, accessible book provides an account of acoustic microscopy techniques for both the novice and experienced user. *Monographs on the Physics and Chemistry of Materials 47* **1992** 364 pp.; illus.; \$95.00

### Quantum Field Theory

### A Modern Introduction

### Міснію Каки

This book presents a clear and comprehensive discussion of the gauge revolution and the theoretical and experimental evidence which makes the Standard Model the leading theory of subatomic phenomena.

February 1993 832 pp.; 79 illus.; \$49.95

### Fundamentals of Crystallography

#### EDITED BY C. GIACOVAZZO

This accessible new textbook offers an overview to crystallography and introduces the many recent theoretical and technological advances in the field. *International Union of Crystallography Texts on Crystallography 2* 1992 674 pp.; 340 illus.; paper \$65.00/cloth \$125.00

### **Biomechanics-Materials**

### A Practical Approach

EDITED BY JULIAN F.V. VINCENT

This detailed book provides experimental protocols which cross the barriers of understanding between biologist and engineers, detailing the properties and testing of bone, cartilage, and joints; liquids, composites, and tensile fibres; stiffness, fracture and adhesion; and plant material.

The Practical Approach Series, IRL Press 1992 272 pp.; 119 illus.; paper \$50.00/cloth \$70.00

### Introduction to Crystallography

### **Revised Edition**

### C. HAMMOND

This newly revised and updated edition of Hammond's successful and popular guide introduces the basic concepts of crystallography with a step-by-step approach that provides a clear account of symmetry and crystal structures. *Royal Microscopical Society Microscopy Handbooks 19* 1992 144 pp.; 71 illus.; paper \$19.95

### Now in a new edition

### Conduction in Non-Crystalline Materials Second Edition

#### SIR NEVILL MOTT

From reviews of the first edition: "Remarkable . . . Covers virtually all the important modern theories about conduction in amorphous materials." — *Journal of the American Chemical Society* April 1993 160 pp.; 75 illus.; \$49.95

To order or for more information, please write:

#### OXFORD UNIVERSITY PRESS 200 Madison Avenue New York, NY 10016

To order by phone, please call toll-free 1-800-451-7556 (credit card orders only)

Prices and publication dates are subject to change without notice

#### Circle No. 47 on Reader Service Card.