

MRS BULLETIN

Materials Research Society Vol. VIII No. 3 May/June 1983

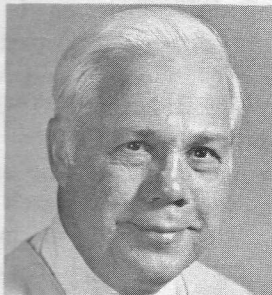
REFUSENIK

BOSTON MEETING

Symposia at a glance

1984 MEETING

Chairmen for Boston named



ASSOCIATE EDITORS

of Materials Letters

USSR bars scientist from MRS meeting

The keynote speaker of the MRS-sponsored conference on phase transformations in solids, Dr. Armen Khachaturyan of the Union of Soviet Socialist Republics, has failed to receive an exit visa from his government and will not attend the meeting, which is being held in Crete.

In protest, Dr. Khachaturyan informs us in a letter whose text is furnished in the adjoining column, the eminent physicist plans to go on a hunger strike during the term of the meeting, which is the five-day period June 27 - July 1.

The letter was received as a photo copy from microfilm, bearing a West German postmark. It is not a hoax. Prof. J.W. Morris of the University of California at Berkeley, a colleague of Dr. Khachaturyan when the Soviet scientist studied in the United States several years ago, was able to place a telephone call to Dr. Khachaturyan and confirm that the letter is authentic.

Dr. Khachaturyan and his wife, Svetlana Semenovskaya-Khachaturyan, who was also to attend the meeting and who like her husband did not receive an exit visa, are refuseniks - those who persist in efforts to emigrate from the Soviet Union despite official disapproval. The Khachaturyans are of Armenian and Jewish descent.

On behalf of the Society, the chairman of the phase transformation conference, Tom Tsakalacos of Rutgers, wrote to the Academy of

A Letter

From Armen

Khachaturyan

TO the members of Organizing Committee of the International Conference on Phase Transformations in solids, Maleme, Crete, Greece

Dear colleagues,

Thank you very much for your kind invitation to attend the Conference. We are, however, deeply distressed to find out that the Soviet Academy of Science does not give us the permission to participate it. We applied for permission to the Vice-Presidents of the USSR Academy E.P. Velikhov and Yu.A. Ovchinnikov, but in vain. This case reflects our present situation as two year refuseniks in which we found ourselves after application to join our relatives abroad. We are deprived of opportunity to communicate with our colleagues, and cut off from all normal channels of scientific work and collaboration. But the most distressing situation is with our son Karen Khachaturyan who was expelled from the

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1983 ANNUAL MEETING IN BOSTON

The what and whom of the foremost materials scientists' meeting

The Materials Research Society's annual program of interdisciplinary, topical symposia will be held at Boston's Park Plaza Hotel Nov. 13-17. A Plenary Session featuring the most distinguished scientists and an expanded series of short courses are particularly noteworthy, but it is the scientific program that has made the meeting the foremost conclave of we who work with materials, and this year's program - organized by B.R. Appleton, B.H. Kear and G.E. Pike - is outstanding.

There are fourteen orthodox symposia scheduled, and one that isn't so orthodox. It is Symposium X, Frontiers of Materials Research, which in the words of its chairman, Rustum Roy of Penn State, is "a symposium crossing all symposia." Outstanding graduate students will be recognized, as will a most eminent scholar, chosen by his or her peers to receive the Society's most prestigious honor, the Von Hippel Award.

As always, the way to receive the most up-to-date information about any aspect of the meeting is to contact the Secretariat, Ernest M. Hawk, Executive Secretary, 110 Materials Research Laboratory, University Park, PA 16802, (814) 865-3424.

Energy-Solid Interactions

The conference Energy Beam-Solid Interactions and Transient Thermal Processing is the sixth in the MRS series devoted to these subjects. This year, in response to strong interest in beam crystallization of semiconductors on insulators (SOI), special emphasis will be placed on the emerging technologies of SOI and their applications.

Symposium co-chairmen are John C.C. Fan, Lincoln Laboratory, Massachusetts Institute of Technology, 244 Wood St., Lexington, MA 02173, (617) 863-5500, Ext. 7836, and Noble M. Johnson, Xerox Corp., Palo Alto

Research Center, 3333 Coyote Hill Road, Palo Alto, CA 94304, (415) 494-4160.

Defect Properties

Increased understanding of the relationships between defects and physical properties of non-metallic materials has already made possible many innovations in high-technology applications. This symposium, Defect Properties and Processing of High-Technology Non-Metallic Materials, focuses on fundamental knowledge of non-metallic materials and opportunities to apply knowledge of defect-sensitive properties to various high-technology applications and process methods.

Symposium co-chairmen are Y. Chen, Solid State Division, Oak Ridge National Laboratory, Oak Ridge, TN 37830, (615) 574-6284, FTS 624-6284; J.H. Crawford Jr., Department of Physics, University of North Carolina, Chapel Hill, NC 27514, (919) 962-3013, and W.A. Sibley, Department of Physics, Oklahoma State University, Stillwater, OK 74074, (405) 624-5627.

Thin Films

The Thin Films and Interfaces symposium offers a forum for discourse on fundamental insights, discoveries and techniques related to thin-film interactions and the properties and structures of thin films and interface layers. Invited and contributed papers will range over such topics as grain boundaries, adhesion, stress in thin films, superlattices and heteroepitaxy.

Co-chairmen are J.E.E. Baglin, IBM Research Laboratory, P.O. Box 218, Yorktown Heights, NY 10598, (914) 945-2280; D. Campbell, IBM East Fishkill Facility, Bldg. 300/48A, Hopewell Junction, NY 12533, (914) 897-3075, and W.K. Chu, Department of Physics and Astronomy, University of North Carolina, Chapel Hill, NC 27514, (919) 962-3014.

Radwaste Management

The MRS symposium, Scientific Basis for Nuclear Waste Management, has in recent years drawn not only scientists, engineers and technicians but also the press, as the subject of disposing of radioactive materials becomes a controversial social question. Despite this, the symposium is a technical meeting in which research results rather than policy are the focus. This year, the emphasis will be on geological media and specific research related to repository placement.

The symposium chairman is G.L. McVay, Materials Department, Battelle, Pacific Northwest Division, Richland, WA 99352, (509) 375-3762.

Ion Implantation

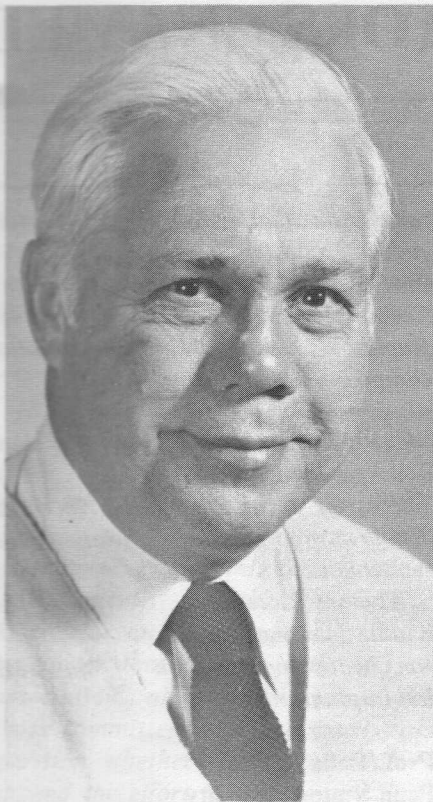
Scientists and engineers who use ion beams in materials research and processing will participate in the symposium entitled, Ion Implantation and Ion Beam Processing of Materials. Primary emphasis at this year's symposium will be on implantation damage and annealing, ion beam mixing, formation and microstructure of metastable materials, properties of ion-implanted materials, applications of ion beam surface modification, implantation into novel materials and novel ion beam processing techniques.

Co-chairmen are C.R. Clayton, Materials Science and Engineering, State University of New York, Stony Brook, NY 11794; O.W. Holland, Solid State Division, Oak Ridge National Laboratory, Oak Ridge, TN 37830; G.K. Hubler, Code 6671, Naval Research Laboratory, Washington, DC 20375 and C.W. White, Solid State Division, Oak Ridge National Laboratory, Oak Ridge, TN 37830.

Metastable Materials

Rapidly Solidified Metastable Materials are the subject of this symposium. They include refined

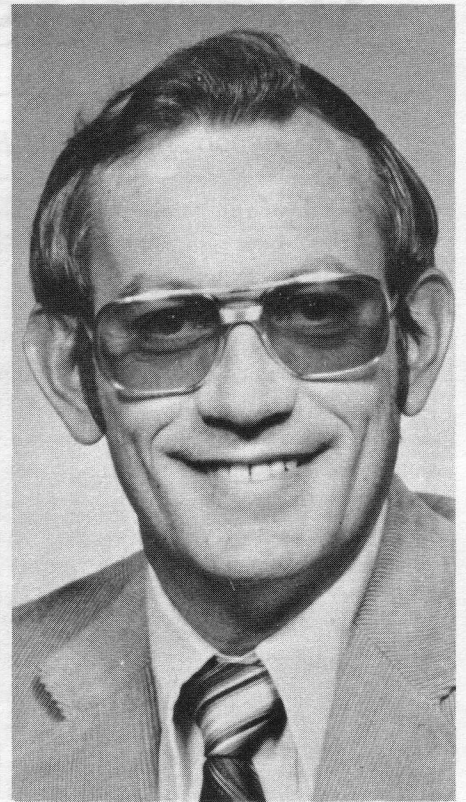
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Walter L. Brown



Jagdish Narayan



Paul S. Peercy

1984 BOSTON MEETING CHAIRMEN

Brown, Narayan and Peercy to chair next year's meeting

Three prominent materials scientists, each with an international reputation and each long active in the MRS, have been chosen to organize the 1984 Annual Meeting, to be held in Boston Nov. 26-29. They are Walter L. Brown of Bell Laboratories, Jagdish Narayan of Oak Ridge National Laboratory and Paul S. Peercy of Sandia National Laboratory.

Their principal creative task is to identify the specific topical symposia that will be conducted during the meeting. They welcome suggestions from the membership.

WALTER L. BROWN is the head of the radiation physics research department at Bell Laboratories. He is a fellow of the American Physical Society and a member of Sigma Xi. His principal research interests include semiconductor surfaces, radiation

damage in semiconductors, measurements of radiation in space, ion implantation, laser annealing, sputtering by ion beams, and electronically excited desorption processes from insulators. In 1982 he was co-chairman of the MRS symposium on laser-solid interactions and transient thermal processing. He has given numerous invited talks at MRS meetings and helped organize several other MRS symposia.

JAGDISH NARAYAN is a senior scientist in the solid state division of the Oak Ridge National Laboratory. He is a fellow of the American Physical Society and has won several awards for his research. His current research interests include defects in semiconductors, laser annealing, radiation damage and the properties of defects in solids. In 1980 he was co-

chairman of the MRS symposium on defects in semiconductors and in 1982 served as co-chairman of the MRS meeting on laser-solid interactions and transient thermal processing. He has given numerous invited talks at other MRS symposia, as well.

PAUL S. PEERCY is the manager of the ion implantation and radiation damage research department at Sandia National Laboratories. His principal research interests include high-power pulsed lasers, Raman and Brillouin scattering, phase transitions and tri-critical behavior in ferroelectrics, ion implantation of semiconductors and ceramics, ion beam analysis of solids and laser annealing. In 1979 he was a co-chairman of the MRS symposium on laser and electron beam processing of materials. He has given invited talks at several MRS symposia.

MATERIALS LETTERS EDITORS NAMED

MRS appoints Associate Editors to new letters journal

As part of the Society's affiliation with the new journal, *Materials Letters*, it appoints a majority of Associate Editors to the journal's Editorial Board. (As the *Bulletin* has reported earlier, the two Principal Editors of the journal are among the MRS's leadership.) Some 28 members constitute the initial MRS representatives.

These scientists will serve staggered terms of two, three or four years, so that in the future a third of the Editorial Board will come up for appointment each year.

Potential contributors to *Materials Letters* are invited to submit contributions to Associate Editors, as well as the journal's Principal Editors.

The editors, their affiliation and area(s) of expertise are:

B.R. Appleton

Oak Ridge National Laboratory
Laser processing; ion-solid interactions

Alan E. Bell

IBM-San Jose
Laser annealing; thin film optics

L.A. Boatner

Oak Ridge National Laboratory
Nuclear waste disposal; crystal growth; EPR

L.L. Chang

IBM-Yorktown Heights
MBE; superlattice and heterostructures

James W. Corbett

SUNY-Albany
Defects in semiconductors

James C.C. Fan

MIT-Lincoln Lab
Semiconductor materials; devices; material processing

Prof. Seijiro Furukuwa

Tokyo Institute of Technology
Ion implantation; epitaxial growth; beam annealing

Dr. James F. Gibbons

Stanford

Ion implantation; laser annealing

B.C. Giessen

Northeastern U.

Rapid solidification rate processing; metallic glasses; alloy phases

Society appoints twenty-eight

Associate Editors to Materials Letters

Dr. Carol M. Jantzen

Du Pont-Savannah
Nuclear waste corrosion management

Elton N. Kaufmann

U. Calif.-Livermore
Nuclear spectroscopic methods; ion beam analysis; surface modification of materials

Dr. Philipp H. Klein

Naval Research Lab
Halides; crystal growth; IR materials

Prof. Kamil Klier

Lehigh University
Characterization catalysts; catalysis

Werner Lutze

Hahn-Meitner-Institut
Nuclear waste forms and materials properties

Farrel W. Lytle

Boeing
EXAFS; structure of catalysts; amorphous materials

Prof. J.W. Mayer

Cornell University
Silicide formation; ion beam modification of materials; thin film reactions

P.A. Montana

West Virginia U.
Materials for coal processing; coal

conversion (catalysis); metal clusters characterization

Prof. B.L. Mordike

Technische Uni. Clausthal
Rapid solidification; deformation; composite materials

J.C. Phillips

Bell Labs-Murray Hill
Theory of chemical bonding in solids; network glasses; amorphous semiconductors

S. Thomas Picraux

Sandia National Lab
Ion beam modification of materials; ion implantation

Prof. Della M. Roy

Penn State University
Cement and concrete; ceramic processing; nuclear waste management

George A. Rozgonyi

No. Carolina State U.
Semiconductor defects; device processing

F.W. Saris

Institute for Atomic and Molecular Physics
Modification and analysis of materials with beams of ions/photons

Frans Spaegen

Harvard
Phase transformations; metallic glasses

John A. Stone

Du Pont-Savannah
Nuclear waste management and disposal

Earl R. Thompson

United Technologies
Composite materials; superalloys; powder metallurgy

C.W. White

Oak Ridge National Lab
Laser annealing; ion implantation

William B. White

Penn State University
Crystal chemistry; ceramic processing; nuclear waste materials; infrared and raman spectroscopy

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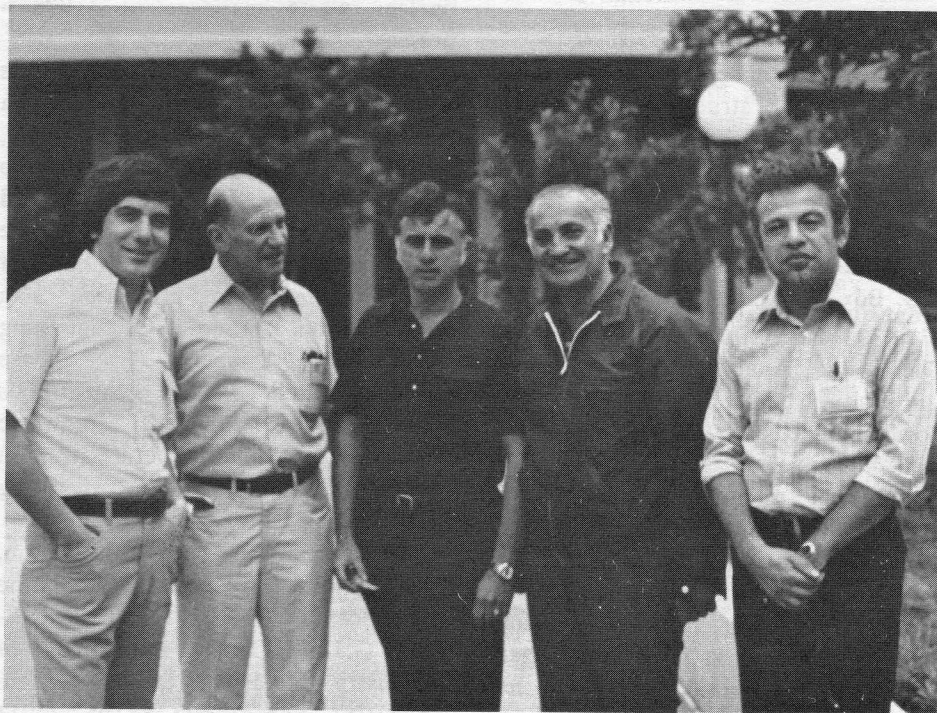
Sciences of the USSR. Noting that the inability of Dr. Khachatryan to receive papers from his government allowing him to attend created numerous problems for conference organizers, he went on to state:

You must recognize that problems such as this have a potentially adverse effect on all Soviet scientists. If international organizing committees must question whether your government will permit the attendance of a scientist of the eminence of Khachatryan in response to an invitation that honors him and, by association, all Soviet science, then those committees will, necessarily, also question whether it is worthwhile to expend the effort to involve any Soviet scientists in international technical conferences.

Dr. Khachatryan is indeed eminent in his field. His theoretical work on phase transformations in crystalline solids has challenged prevailing views and stimulated fresh experimental investigations. His innovative approaches to the theory of alloy decomposition and premartensitic transformation phenomena are receiving attention worldwide, and promise a fuller understanding of the pervasive and technologically important transformation mechanisms in concentrated solid solutions.

I share Tom Tsakalacos's indignation that Dr. Khachatryan is denied by the Soviet government the opportunity to participate in our meeting. I am saddened by the pain which this episode reveals has been inflicted on the Khachatryans. I wish them well, as I am sure all of my MRS colleagues do. It will be a better day when next Dr. Khachatryan and his colleagues from throughout the scientific community can meet.

Harry Leamy
President
Materials Research Society



ARMEN KHACHATURYAN in happier days at the International Meeting on Modulated Structures; Hawaii, March 1979. Khachatryan is at the extreme right. Others in the group are, from left to right: T. Tsakalacos, Rutgers University, L. Zwell, International Centre of Powder Diffraction Data, J. Cohen, Northwestern University, and S. Weissmann, Rutgers University.

LETTER

[Continued from Page 1]

Moscow University for application and lost his right to continue his education and have a decent job. The details you may have seen from the enclosed letter to participants of the Conference, which we wrote together with our colleagues-refuseniks Prof. Dr. E. Nadgorny and Prof. Dr. L. Ozernoy. [This letter will be read to conference participants in Crete.] They joined us in our decision to go on the hunger-

strike during all the working time of the Conference [emphasis in the original] as a protest against the refusal of the USSR Academy of Sciences to allow us to attend the Conference and against the refusal of the Soviet authorities to give us exit visas.

Faithfully yours
[Signed]
Armen Khachatryan
Svetlana Semenovskaya-
Khachatryan

May 5, 1983

BOSTON

[Continued from Page 2]

structures, extended solid solutions, microcrystalline structures, metastable crystalline phases and amorphous solids.

Co-chairmen are B.H. Kear, Corporate Research Laboratories, Exxon Research and Engineering Co., P.O. Box 45, Linden, NJ 07036, (201) 474-6393 and B.C. Giessen, Institute of Chemical Analysis, Northeastern University, 360 Huntington Ave., Boston, MA 02115, (617) 437-2827.

Solid-Waste Disposal

Materials research has significant impact on the utilization, immobilization and disposal of solid wastes from manufacturing and energy industries through its chemical and physical characterization. The Society has long recognized this and has sponsored very successful symposia in such areas as fly ash incorporation in cement and concrete (1981) and

nuclear waste management (1978 - present).

This year the Society will inaugurate what is expected to become a continuing symposium on the topic, Materials Characterization Applied to the Utilization, Immobilization and Disposal of Solid Wastes. It will range across such topics as applications of phase diagrams in predicting slag devitrification, fixation of Cr containing industrial wastes, phase characterization of cementitious composites for low-level radwaste disposal and microstructure-strength correlation in cement incorporating flyash or slag.

The co-chairmen are S.L. Blum, Northern Energy Corp., 470 Atlantic Ave., Boston, MA 02116, (617) 292-9250; G.J. McCarthy, Department of Chemistry, North Dakota State University, Fargo, ND 58105, (701) 237-7193, and B.E. Scheetz, Materials Research Laboratory, Pennsylvania State University, University Park, PA 16802, (814) 865-3539.

Synchrotron Radiation

Techniques based on the special properties of synchrotron radiation have a wide range of applications in materials Research. The symposium Materials Science Using Synchrotron Radiation seeks to provide an overview of the techniques and in particular the results of important research. Topics will include bulk and surface structural characterization on various materials phenomena such as structural transformations, catalysis and electrolysis, and on technological applications such as lithography and angiography.

Co-chairmen are Peter Eisenberger, Exxon Research and Engineering Co., P.O. Box 45, Linden, NJ 07036, (201) 474-3638, and David Moncton, Brookhaven National Laboratory, Upton, NY 11973, (516) 282-2741.

Laser Processing

This year the symposium Laser-Controlled Chemical Processing of Surfaces is an extension of one begun last year on photon-induced chemical

processing for semiconductor devices. It will focus on chemical reactions driven by lasers that lead to deposition, etching, doping and micromachining of surfaces. Areas of particular interest include bond-specific photochemistry on surfaces, laser-chemical doping of solids, optical diagnostics of chemical reactions in process technology and laser chemical vapor deposition and photo-chemical vapor deposition.

A.W. Johnson, Sandia National Laboratories, Division 1126, Albuquerque, NM 87185, (505) 844-8782, and D.J. Ehrlich, Lincoln Laboratory, Massachusetts Institute of Technology, Lexington, MA 02174, (617) 863-5500, Ext. 4723, are the co-chairmen.

Positron Annihilation

Recent advances in nuclear spectroscopy have made it possible for condensed-matter scientists to use positrons as probes of material properties. Fundamental experiments have shown that characteristics of positron annihilation in solids change as the state of the matter is altered, e.g., by temperature or deformation. The symposium Applications of Positron Annihilation to Materials Research will focus on such matters as near-surface and interfacial defects, ion implantation and laser annealing effects, studies of voids and gaseous impurities, investigations of surface magnetism and diffraction with low-energy positions.

Co-chairmen are A.N. Goland, Department of Energy and Environment, Building 179A, Brookhaven National Laboratory, Upton, NY 11973, (516) 282-3819, and K.G. Lynn, Department of Physics, Building 510B, Brookhaven National Laboratory, Upton, NY 11973, (516) 282-3710.

Catalytic Reaction

The symposium entitled Catalytic Reaction Mechanisms: The Role of Surface Structure and Composition will bring together investigators from the

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Dates of Albuquerque meeting changed

The Society's spring meeting, to be held in Albuquerque, will be held Feb. 27-29. The dates originally announced were found to present serious scheduling problems for the organizers. The symposia topics, hotel, and other arrangements are unchanged. The symposia are:

- Better Ceramics through Chemistry
- Materials for Computer Displays and Printers
- Optical and Magnetic Data Storage Materials
- Comparison of Thin Film Transistor and SOI Technologies

The meeting will be held at the Albuquerque Marriott Hotel.

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two major areas of study in the field, surface science and supported catalysts. The presentations will focus on the roles played by surface structure and chemical composition in determining surface reaction intermediates and hence reaction selectivity. The variation in reaction pathways will be discussed for alloys as a function of surface composition and for pure metals and oxides modified by electronegative and electropositive elements.

The co-chairmen are G.B. Fisher, Physical Chemistry Department, General Motors Research Laboratories, Warren, MI 48090, (313) 575-7192, and P.C. Stair, Department of Chemistry, Northwestern University, Evanston, IL 60201, (312) 492-5266.

Plasma Processing

Materials processing by the use of plasmas is a rapidly growing field. The quest for materials with novel microstructures, synthesizing new materials, the manufacture of gradient materials and extracting/processing metals and ceramics all are being achieved through the use of plasma processing. The symposium Plasma Processing and Synthesis of Materials will bring together users of plasmas (low pressure and conventional) in materials metallurgy, materials synthesis, rapid solidification, coatings and many other applications.

The co-chairmen are D. Apelian, Department of Materials Engineering, Drexel University, Philadelphia, PA 19104, and J. Szekely, Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA 02139.

B Crystal Growth

The symposium Progress in Bulk Semiconductor Crystal Growth will focus on such advances as crystal growth techniques, doping profile controls, elimination of defects in crystals, characterization of crystal quality, process simulations by

computer and crystal growth by use of special configurations. The materials to be discussed include silicon and III-V compounds. Co-chairmen are J.H. Wernick, Device Materials Research Department, Bell Laboratories, 600 Mountain Ave., Murray Hill, NJ 07974, (201) 582-2463, and F.F.Y. Wang, Department of Materials Science and Engineering, University of New York, Stony Brook, NY 11794, (516) 246-5980.

Electron Microscopy

The conference Electron Microscopy of Materials is the third in a series of MRS symposia covering both instrumentation and materials applications. This year four topics have been chosen as the focus of discussion: current trends in electron microscope characterization techniques, semiconducting materials, surface and interfaces and ceramic materials.

Co-chairmen are L.W. Hobbs, Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA 02139, (617) 253-6835; William Krakow, IBM T.J. Watson Research Center, P.O. Box 218, Yorktown Heights, NY 10598, (914) 945-1759, and D.A. Smith, IBM T.J. Watson Research Center, P.O. Box 218, Yorktown Heights, NY 10598, (914) 945-2512.

Frontiers

One of last year's best-received innovations, Symposium X entitled Frontiers of Materials Research, will be reprised this year by its chairman and creator, Rusty Roy. It is a series of authoritative reviews for the non-specialist, two a day Monday through Wednesday, Nov. 14-17, over the luncheon period. Roy can be reached at the Materials Research Laboratory (of which he is the director), Pennsylvania State University, University Park, PA 16802, (814) 865-3421.

The Symposium X lectures will be published by the Journal of Materials Education, another of Rusty's innovations whereby core materials are

made available as educational modules unencumbered by copyright restrictions to the undergraduate and even graduate schools of science at colleges and universities around the world.

Proceedings

The proceedings of MRS symposia are published by Elsevier Science Publishing Company, a unit of North-Holland Publishing Company. MRS members are entitled to substantial discounts on volumes in the Proceedings series, including the limited number that remain from past symposia.

In general, the deadline for the submission of abstracts of contributed papers to the symposia has passed. The chairmen of most symposia will, however, consider a limited number of late submissions that are particularly timely or uniquely important.

MRS BULLETIN

VOLUME VIII NUMBER 3

The Materials Research Society Bulletin is published bi-monthly by the Materials Research Society for its members and others interested in materials science. Correspondence and submissions are invited. They should be brief and typewritten (double-spaced), and the author's affiliation must be indicated. Address all material to the Editor.

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Editor
T.G. MIDDLETON
P.O. Box K
Short Hills, NJ 07078
(201) 467-0504



MATERIALS RESEARCH SOCIETY
102C Materials Research Laboratory
University Park, PA 16802

MOLECULAR BEAM EPITAXY

MRS co-sponsors Third International Conference August 1 - 3

The Society is co-sponsor of the Third International Conference on Molecular Beam Epitaxy, to be held in San Francisco Aug. 1-3. The meeting is a major forum for the exchange of information on important new results in fundamental and applied research in molecular beam epitaxy.

Conference Chairman A.Y. Cho of Bell Laboratories said that among the topics to be discussed are semiconductor, metal and insulator; thermodynamic and kinetic aspects; growth and doping characteristics; metallurgical and electronic properties; surface and interface studies; heterostructure and superlattice; microwave and digital devices; optoelectronic devices, and equipment designs.

Cho said the meeting co-chairmen are L.L. Chang of IBM at Yorktown Heights (an MRS Councillor), B.A. Joyce of Redhill and K. Takahashi of Tokyo.

The Program Committee, chaired by H. Morkoc of Urbana, includes J.C.

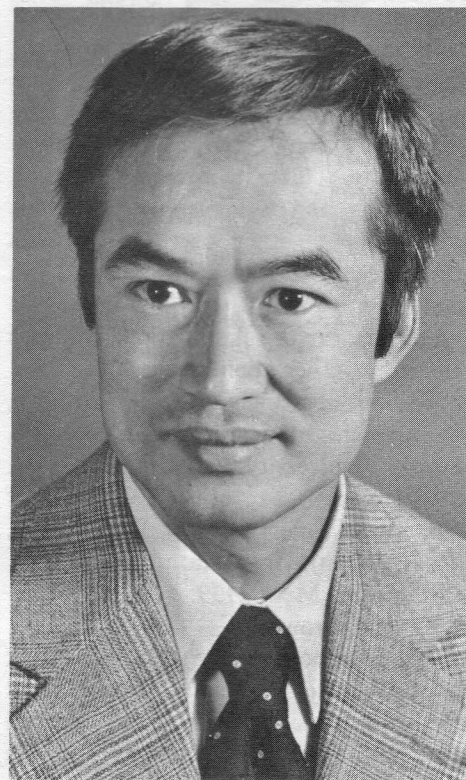
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The Local Chairman is D.M. Collins of Palo Alto. Publication Chairman is J.R. Arthur of Corvallis. Treasurer is P.D. Coleman of Urbana.

Other sponsoring organizations are the Institute of Electrical and Electronics Engineers, the American Physical Society, the American Vacuum Society and the Office of Naval Research.

MRS members are entitled to a reduced fee of \$140 to attend the conference, which will be held at the San Francisco Hilton and Tower.

For further information, contact Cho at Bell Labs, 600 Mountain Ave., Murray Hill, NJ 07974.



A.L. Cho