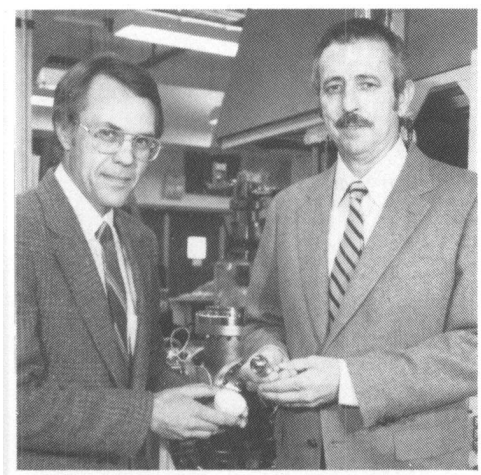
Ion-Implanted Material Leads the Way for New Generation Prosthetics

Artificial Hip Joint Presented to President Reagan

A new process for improving the wear properties of a titanium-based alloy used in artificial hip and knee joints was described to President Reagan in September at a presidential briefing held at the University of Tennessee. Describing for the President the importance of industry/government/university collaboration, Oak Ridge National Laboratory Director Herman Postma chose the new process as an example of how such cooperative research work can result in a successful commercial product.

Postma emphasized the potential humanitarian and economic benefits of the new process. Approximately 100,000 total hip joints and 60,000 knees are surgically implanted per year in the United States at an estimated cost of some $3.2 billion. Many of these are revisions of previous operations, and, in addition, many patients who need surgery are advised to wait until the they are older because the anticipated lifetimes of devices are too short. Improving the technology of prosthetics cannot only alleviate suffering but can also provide economic benefits by reducing the number of revisions, reducing patient care and rehabilitation, reducing the need for pharmaceuticals, and improving the productivity of the workforce.

In laboratory tests, it has been shown that the process, involving the implantation of nitrogen ions into the near-surface region of the material, reduces the wear rate of the alloy by a factor up to 10,000. The treatment of the alloy also improves the wear performance of the mating plastic component. These results can contribute directly and indirectly to improved hip and knee joints.



Leaders of the research work, Raymond A. Buchanan (left) and J. M. Williams.

President Reagan listens as Postma (right) discusses research on ion-implanted materials for hip joints. Jack Reese (center), chancellor of the University of Tennessee, looks on.

Johnson & Johnson Products, Inc., Orthopaedics Division and Spire Corporation, two Boston-area firms, are collaborating in marketing products utilizing the new process. Johnson & Johnson Products, Inc., is a leading national manufacturer of orthopaedic devices and Spire is a high-technology firm whose specialties include ion implantation. Knees are expected to be the first product.

J. M. Williams, scientist in ORNL's Solid State Division, led the collaborative research work with Raymond A. Buchanan of the University of Alabama-Birmingham. Williams is co-chair, with M. F. Nichols and W. Zingg, of MRS's first symposium on Biomedical Materials being held at the 1985 Fall Meeting.

Ti-6A1-4V is a titanium-based alloy originally developed for aerospace applications because of its light weight and high strength properties. Currently, the most important use for ion implantation technology is in the semiconductor industry where it is used to introduce dopants into the surface of solid-state electronics. Treatment of orthopaedic devices is expected to be the next important commercial application for the technology. The cost of the treatment is small compared with the substantial surgical and hospitalization costs for a hip or knee operation.

Research Reported at MRS Meetings

The research into the use of ion-implanted titanium-based alloy for application in surgical implants was first reported at the 1983 MRS Annual Meeting and is published in *Ion Implantation and Ion Beam Processing of Materials*, edited by G. K. Hubler, O. W. Holland, C. R. Clayton, and C. W. White, Volume 27 of the Materials Research Society Symposia Proceedings series. (See "Effect of N-Implantation on the Corrosion—Wear Properties of Surgical Ti-6A1-4V Alloy," by J. M. Williams, G. M. Beardsley, R. A. Buchanan, and R. K. Bacon.)

A panel discussion being conducted at the Biomedical Materials Symposium at the 1985 Fall Meeting will further explore the material for surgical applications. The panel, led by Stephen Gordon of the National Institutes of Health, includes: Raymond Buchanan (University of Alabama-Birmingham), K. W. Greer (Johnson & Johnson Products, Inc.,), P. Higham (Howmedica, Inc.), J. Parr (Zimmer, Inc.), J. T. Scales (University of London), and D. Mears (University of Pittsburgh). The panel will be conducted Wednesday, December 4, at 3:30 p.m. in the America Ballroom, Westin Hotel.

In addition to materials for orthopaedics, other particularly strong aspects of the program include cardiovascular materials and materials for bioelectrodes. The four-day Biomedical Materials Symposium begins on Tuesday, December 3.

Fly Ash and Coal Conversion By-Products: Characterization, Utilization and Disposal I

Edited by Gregory J. McCarthy and Robert J. Lauf

Proceedings of the Symposium held at the 1984 MRS Fall Meeting contains 24 papers which explore analysis and handling of fly ash and consider environmental consequences and potential future uses of the material in industrial or civil engineering applications.

Topics:

- Characterization of fly ash and its reactions in concrete
- Transmitted and reflected visible light microscopy of two bituminous fly ashes
- Scanning electron microscopy and x-ray diffraction analysis of various size fractions of fly ash
- Electrokinetic phenomena and surface characteristics of fly ash particles
- Technical note on the determination of free lime (CaO) in fly ash
- Characterization of cyrstalline phases in fly ash by microfocus Raman spectroscopy
- Characterization of catalyzed devitrification in quenched fly ash melts
- Retardation effects in the hydration of cement-fly ash pastes
- Reactions products in fly ash concrete
- Autoclave expansion of Portland cement-fly ash pastes
- Effects of fly ash and superplasticizers on the rheology of cement slurries
- Flexural strength and fracture properties of a fly ash blended cement
- Properties and potential uses of the products resulting from the fluidized bed combustion of coal washery wastes
- Utilization of fly ash in roadbed stabilization—some examples of western U.S. experience
- Utilization of fly ash in oil and gas well cementing applications
- Potential resources for coal fly ash
- Characterization of a lignite ash from the METC Gasifier—mineralogy, scanning electron microscopy, and correlations of leaching behavior and mineralogy
- Comparative economics of several alternatives for bulk utilization of fly ash and coal gasification ash
- Disposal of western fly ash in the Northern Great Plains
- Mobility of organic and inorganic constituents from energy and combustion-related wastes under codisposal conditions
- Investigation of leachability of subbituminous fly ash enhanced road based materials
- Technical review of the Energy Authority Coal Waste Artificial Reef Program (C-WARP)

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Coming in Early 1986: Fly Ash and Coal Conversion By-Products: Characterization, Utilization and Disposal II

WELCOME TO THE 1985 MRS FALL MEETING

This special section of the **BULLETIN** includes floor plans of the hotels, schedules on symposia, poster sessions, exhibits, and other activities throughout the week. Refer to this section to plan your itinerary for the week.

Symposium A	Beam-Solid Interactions and Phase Transformations
Symposium B	Rapid Thermal Processing
Symposium C	Semiconductor on Insulator and Thin Film Transistor Technology
Symposium D	Beam Induced Chemical Processes
Symposium E	Thin Films — Interfaces and Phenomena
Symposium F	Transport and Excitation in Polymers
Symposium G	Biomedical Materials
Symposium H	Layered Structures and Epitaxy
Symposium I	Phase Transitions in Condensed Systems — Experiments and Theory
Symposium J	Rapidly Solidified Alloys and Their Mechanical and Magnetic Properties
Symposium K	Oxygen, Carbon, Hydrogen, and Nitrogen in Crystalline Silicon
Symposium L	Defect Properties and Processing of High-Technology Nonmetallic Materials
Symposium M	Oxides, Zeolites and Clays in Catalysis
Symposium N	Fractal Aspects of Materials
Symposium O	Nonlinear Optical Materials
Symposium P	Defects in Glasses
Symposium Q	Materials Problem Solving with the Transmission Electron Microscope
Symposium R	Computer-Based Microscopic Description of the Structure and Properties of Materials
Symposium S	Cement-Based Composites: Strain Rate Effects on Fracture
Symposium T	Fly Ash and Coal Conversion By-Products: Characterization, Utilization and Disposal II
Symposium X	Frontiers in Materials Research
Symposium Y	Frontiers in Materials Education

AIP Placement Service Form For Use At The 2–6 December 1985 Meeting of the

MATERIALS RESEARCH SOCIETY

Return to:
American Institute of Physics
335 East 45th Street, New York, NY 10017

Date _____

Name _____ Tel. # (Bus.) _____ (Home) _____

Address _____
Street City State Zip

Citizenship: ☐ U.S.A. ☐ Permanent Resident Visa ☐ Temporary Visa

EMPLOYMENT

(list in reverse chronological order—present position first)

Position and nature of work

Description of Thesis, Principal Research and Publications

State briefly just what kind of position you desire

AIP/MRS has my permission to show this to any employer.

Signature _____

Please leave this margin clear.

Call and File Number

Major Subject	Institution	Year	Degree
			BA or BS
			MA or MS
			PhD
			Other

Years of training and/or experience in area below.

Fill in the number of years beyond undergraduate degree in the appropriate column.	Teaching	Academic Research	Industrial/Laboratory Experience
FIELD OF TRAINING			
Biology			
Chemistry			
Earth Sciences			
Engineering			
Materials Science			
Metallurgy			
Physics			
Other			
Subfield of the above			
MATERIALS			
Amorphous materials/glasses			
Biomaterials			
Cement			
Ceramics			
Composites/Cermets			
Earth materials			
Electronic materials			
Insulators			
Magnetic materials			
Metals/Alloys			
Nuclear materials			
Nuclear waste form materials			
Optical materials			
Polymers			
Semiconductor materials			
Other			
SELECTED TOPICS			
Catalysis			
Corrosion			
Crystal growth			
Crystallography/crystal chemistry			
Defects			
Environmental science/engineering			
Beam (laser and ion) analysis/ solid interactions			
Materials processing/fabrication			
Mechanical and physical properties			
Phase equilibria/transitions			
Polymer science and engineering			
Thin films/surfaces/interfaces			
Vacuum science and technology			
Other			

Specify analytical techniques with which you have experience.

PREFERRED AND ACCEPTABLE POSITIONS (check)	P	A
Industrial Development		
Industrial Research		
Government Research or Civil Service		
Teaching only Undergraduates		
Undergraduate Teaching and Research		
Teaching Graduate and Research		
Academic Research only		
Institutional (Non-Profit) Research		
Other		

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Message From the Program Chairs

The annual MRS Fall Meeting in Boston has become the hallmark meeting on new research results in both established and emerging materials areas. This year's Fall Meeting clearly demonstrates the research community's enthusiasm for the MRS-style interdisciplinary forum. A record 22 free-standing symposia are offered totaling over 1,200 technical papers on developments in metals, alloys, ceramics, glasses, cements, and amorphous materials for applications ranging from semiconductors to biocompatible materials. Along side the popular on-going symposia themes will be a number of new topics to MRS, including polymers, computer-based microscopic description of structure and properties of materials, biomedical materials, and a special symposium on materials education which will address issues in instructional theory and curricula planning for university materials science programs.

Special highlights of the week include a Monday-evening ceremony to honor the 1985 Von Hippel Award winner, John W. Cahn of the National Bureau of Standards and graduate student award winners. A Plenary lecture on "Materials for SDI" will be presented Wednesday evening by Dr. Gerald Yonas, chief scientist and acting deputy director, Strategic Defense Initiative Organization. Throughout the week, registrants can afford themselves of the opportunity to mingle informally with colleagues at poster sessions, browse through more than 100 manufacturers' booths at the Equipment Exhibit, and participate in the Job Placement Center.

An unprecedented 14 short courses will be offered on Friday and Saturday. Registrants who are interested in attending any of the courses, but have not yet registered, are encouraged to inquire at the Registration desk.

This meeting will result in the publication of a record number of conference publications. Three Extended Abstracts outlining presentations in Symposia D, N, and O are now available for $5 each in the Registration area, and 16 full proceedings volumes will be published following the Meeting. You are encouraged to purchase the books in advance to take advantage of special conference prices and to inform your library of the new proceedings.

Also look for subscription and editorial information on the Society's newest project, *Journal of Materials Research*, at the meeting. Literature on this premier archival journal for interdisciplinary materials research is in the Registration area and at the JMR booth at the Exhibit. JMR Editor-in-Chief Charles B. Duke will be available at the booth frequently throughout the week to discuss editorial scope and plans for the journal. It is hoped that much of the work addressed at this meeting will become permanently documented in the journal. Registrants are also encourage to contribute full-length manuscripts to the journal and make sure their libraries have entered subscriptions to it.

This section of the **BULLETIN** is a supplement to the Final Program and Abstract Book for the 1985 Fall Meeting. Please use the maps, schedules, forms, and other information presented here to help you make the best use of your time during this week in Boston. Enjoy it!

J. E. E. Baglin
D. K. Biegelsen
J. C. C. Fan

Job Placement Center

A job placement center will be in operation during the Fall Meeting of the Materials Research Society to enable prospective employees and employers to meet face-to-face and discuss career opportunities confidentially. The Center is organized and operated by the American Institute of Physics.

The purpose of the Job Placement Center is to arrange interviews between prospective employees and employers attending the meeting. Candidate forms will be made available for examination by interested employers. Descriptions of employment opportunities provided by employers, both attending and nonattending, will be posted on bulletin boards in the Placement area.

If you wish to participate, complete the AIP Placement Center form in this section of the **BULLETIN** if you have not already done so, and take it along with your resume to the Placement Center.

If you have preregistered with the Center, report to the Center to receive a Placement identification number.

The fee for the service is $5.00.

The Center is located in the Brandeis/Northeastern Suite and will be open Tuesday-Thursday, December 3-5, from 9:00 a.m. to 5:00 p.m.

FALL MEETING TIMETABLE

REGISTRATION HOURS:
(Fourth Floor)
Sunday: 4:00 p.m.-9:00 p.m.
Monday: 7:00 a.m.-9:00 p.m.
Tuesday-Thursday: 7:30 a.m.-5:00 p.m.
Friday: 7:30 a.m.-noon

POSTER SESSION HOURS:
(See session locations Final Program and Abstract Book)
Tuesday-Thursday: 7:00 a.m.-10:00 p.m.

EQUIPMENT EXHIBIT HOURS:
(Exhibit Hall)
Tuesday-Wednesday: 9:00 a.m.-5:00 p.m.
Thursday: 9:00 a.m.-2:00 p.m.

JOB PLACEMENT CENTER HOURS:
(Brandeis/Northeastern Room)
Tuesday-Thursday: 9:00 a.m.-5:00 p.m.
Fee: $5.00 for employment candidates (complete Job Placement Form in this issue)
$60.00 for employers.

VON HIPPEL AWARD AND LECTURE:
(Grand Ballroom)
Monday 6:30 p.m.

PLENARY SESSION:
(Grand Ballroom)
Wednesday: 5:45 p.m.-7:00 p.m.
"Materials for SDI" — Gerald Yonas

SLIDE PREVIEW:
(Nantucket Room)
Monday-Friday: 8:00 a.m.-5:30 p.m.

MANUSCRIPT PREPARATION:
(Harvard Room)
Monday-Friday: 8:00 a.m.-5:30 p.m.

MRS PUBLICATIONS DESK:
(Fourth Floor)
Monday: 2:00 p.m.-5:00 p.m.
Tuesday-Thursday: 9:00 a.m.-5:00 p.m.
Friday: 9:00 a.m.-1:00 p.m.

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14 SHORT COURSES
On
ADVANCED MATERIALS RESEARCH TECHNIQUES

Sponsored by the Materials Research Society in conjunction with
the 1985 Fall Meeting, Boston, Massachusetts.

On site registrations will be accepted at the MRS Fall Meeting if space is available. Inquire at the Registration Desk, Fourth Floor, Boston Marriott.

Friday, December 6, (One-Day Courses)

Ion Implantation and Rapid Thermal Annealing
Instructor: T. E. Seidel, J. C. Schumaker Co.

Deep Level Transient Spectroscpy
Instructor: C. E. Barnes, Aerospace Corporation

Sol-Gel Processing of Glass
Instructor: C. Jeffrey Brinker, Sandia National Laboratories

Applications of Reflection Electron Diffraction to Epitaxial Growth
Instructor: P. I. Cohen, University of Minnesota

Saturday, December 7 (One-Day Course)

Ion Beam Modification of Non-Semiconductors
Instructor: J. K. Hirvonen, SPIRE, Inc.

Friday-Saturday, December 6-7 (Two-Day Courses)

Surface and Thin Film Analysis
Instructors: Leonard C. Feldman, AT&T Bell Laboratories
James W. Mayer, Cornell University

Liquid Phase Epitaxy Techniques
Instructor: L. R. Dawson, Sandia National Laboratories

Vapor Phase Epitaxy
Instructors: Herbert M. Cox, Bell Communications Research
P. D. Dapkus, University of Southern California

Molecular Beam Epitaxy
Instructor: Gary W. Wicks, Cornell University

Vacuum Technology
Instructor: Mars H. Hablanian, Varian Vacuum Division

Materials Aspects of Silicon Devices
Instructors: Subhash Mahajan, Carnegie-Mellon University
K. S. SreeHarsha, San Jose State University

Electronic Properties of Amorphous Semiconductors
Instructor: David Adler, Massachusetts Institute of Technology

Processing-Microstructure-Mechanical Property Relationships in Metals
Instructor: Kenneth H. Eckelmeyer, Sandia National Laboratories

Films and Coatings for Engineering Applications
Instructor: Don Mattox, Sandia National Laboratories

The MRS Short Course Program is an activity of the MRS Education Committee.

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Announcing

1986 MRS SPRING MEETING

April 15-18 • Palo Alto, California

Program Chairs: Wei-Kan Chu (University of North Carolina) (919) 962-3014
Rod K. Quinn (Sandia National Laboratories) (505) 844-1933
Malcolm J. Thompson (Xerox PARC) (415) 494-4561

Symposium A
Heteroepitaxy on Silicon Technology
Chairs: John C. C. Fan (MIT Lincoln Laboratory) (617) 863-5500
John M. Poate (AT&T Bell Laboratories) (201) 582-3462

Symposium B
Compound Semiconductor Materials
Chairs: L.R. Dawson (Sandia National Laboratories) (505) 846-3451
V.G. Keramidas (Bell Communications Research) (201) 582-3290

Symposium C
Plasma Processing
Chairs: J. Coburn (IBM) (408) 256-7322
R.A. Gottscho (AT&T Bell Laboratories) (201) 582-7921
D.W. Hess (University of California-Berkeley) (415) 642-4862

Symposium D
Materials Characterization
Chairs: Nathan W. Cheung (University of California-Berkeley) (415) 642-1615
Marc-A. Nicolet (California Institute of Technology) (818) 356-4803

Symposium E
Materials Issues in Amorphous Semiconductor Technology
Chairs: D. Adler (Massachusetts Institute of Technology) (617) 253-6868
Y. Hamakawa (Osaka University) Osaka, Japan
A. Madan (Glasstech Solar, Inc.) (303) 425-6600

Symposium F
Materials Issues in Silicon Integrated Circuit Processing
Chairs: M. Wittmer (IBM Watson Research Center) (914) 945-1950
J. Stimmell (National Semiconductor) (408) 721-3135
M. Strathman (Charles Evans & Associates) (415) 572-1601

Symposium G
Electronic Packaging Materials Science
Chairs: Donald R. Uhlmann (Massachusetts Institute of Technology) (617) 253-6895
Donald R. Ulrich (AFOSR) (202) 767-4963
Robert Pohanka (ONR) (202) 696-4401
Kenneth A. Jackson (AT&T Bell Laboratories) (201) 582-4188

Symposium H
Better Ceramics Through Chemistry
Chairs: C. Jeffrey Brinker (Sandia National Laboratory) (505) 846-3552
D.E. Clark (University of Florida) (904) 392-5256
Donald R. Ulrich (AFOSR) (202) 767-4963

Symposium I
Materials for Chemical Sensors
Chairs: S.C. Chang (GE Research Laboratory) (313) 575-7726
J. N. Zemel (University of Pennsylvania) (215) 898-8545

Symposium X
Frontiers of Materials Research
Chair: Rustum Roy (Pennsylvania State University) (814) 865-3421

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1986 MRS FALL MEETING

December 1-5, 1986 • Boston, Massachusetts

The following is a tentative list of symposia to be held at the 1986 MRS Fall Meeting. For further information contact the symposium organizers listed for each symposium, or contact the Program Chairs:

R. P. H. Chang, AT&T Bell Laboratories, Room 7C-413, Murray Hill, NJ 07974; telephone (201) 582-2327

Carol M. Jantzen, E. I. DuPont de Nemours & Co., Savannah River Laboratory, Aiken, SC 29808; telephone (803) 725-2374

J. B. Roberto, Oak Ridge National Laboratory, Solid State Division, Oak Ridge, TN; telephone (615) 576-0227

Symposium A
Beam-Solid Interactions and Transient Processes
Chairs: S. T. Picraux (505) 844-7681
M. Thompson (607) 256-4714
J. S. Williams (03) 660-2459 (Australia)

Symposium B
Photon, Beam and Plasma Stimulated Chemical Processes at Surfaces
Chairs: V. Donnelly (201) 582-3471
I. P. Herman (415) 442-1132

Symposium C
Science and Technology of Microfabrication
Chairs: R. E. Howard (201) 949-5952
S. Pang (617) 863-4664
E. L. Hu (805) 961-2368
S. Namba Osaka, Japan

Symposium D
Interfaces, Superlattices and Thin Films
Chairs: J. Dow (219) 239-6387
I. Schuller (312) 972-5469
J. E. Hilliard (312) 491-3537

Symposium E
Advances in Structural Ceramics
Chair: Paul F. Becher (615) 574-5157
M. Swain (Melbourne, Australia)

Symposium F
Static and Dynamic Scattering from Polymers
Chairs: D. G. Wignall (615) 574-5237
B. Crist (312) 491-3279
T. P. Russell (408) 256-7248

Symposium G
Rapidly Solidified Alloys (tentative title)
Chairs: M. A. Tenhover (216) 581-5814
W. L. Johnson (818) 356-4433
L. E. Tanner (415) 423-2653

Symposium H
High Temperature Ordered Intermetallic Alloys
Chairs: C. T. Liu (615) 574-4459
O. Izumi (81) 222-227437 (Japan)
C. C. Koch (919) 737-2377
N. S. Stoloff (518) 266-6371

Symposium I
Characterization of Defects in Solids
Chairs: R. W. Siegel (312) 972-4963
J. R. Weertman (312) 491-5353
R. Sinclair (415) 497-1102

Symposium J
Physical and Chemical Properties of Thin Metal Overlays and Alloy Surfaces (tentative title)
Chairs: D. W. Zehner (615) 574-6291
G. W. Goodman (505) 844-5435

Symposium K
Intercalated Graphite
Chairs: S. A. Solin (517) 353-5133
M. S. Dresselhaus (617) 253-6864
G. Dresselhaus (617) 253-6827

Symposium L
Scientific Basis for Nuclear Waste Management X
Chairs: J. K. Bates (312) 972-4385
W. B. Seefeldt (312) 972-4390

Symposium M
Microstructural Development During Dehydration of Cements
Chairs: P. Brown (301) 921-3458
Leslie Strubble (301) 921-2635

Symposium N
Fly Ash and Coal Conversion By-Products: Characterization, Utilization and Disposal III
Chairs: Della M. Roy (814) 865-1196
G. J. McCarthy (701) 237-7193
F. P. Glasser (44) 224-40241 (UK)

Symposium O
Materials Processing in the Reduced Gravity Environment of Space
Chairs: R. Doremus (518) 266-6709
P. Nordine (816) 753-7600 Ext. 377

Symposium P
Optical Fiber Materials Properties
Chairs: S. Nagel (201) 582-6623
G. Sigel (201) 932-4729
J. W. Fleming (201) 582-4499
D. A. Thompson (607) 974-3311

Symposium Q
Diluted Magnetic (Semimagnetic) Semiconductors
Chairs: J. K. Furdyna (317) 494-5567
R. L. Aggarwal (617) 253-5509
S. von Molnar (914) 945-2913

Symposium R
Materials for Infrared Detectors and Sources
Chairs: R. F. C. Farrow (408) 256-4962
J. Cheung (805) 373-4144
J. F. Schetzina (919) 737-2515

Symposium S
Superconducting Materials
Chairs: J. Bevk (201) 582-5913
A. I. Braginski (412) 256-1351

Symposium X
Frontiers of Materials Research
Chair: R. Roy (814) 865-3421

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1985 MRS FALL MEETING
EXHIBITORS

(as of October 22, 1985)

***Academic Press**
Booth #922

AG Associates
Booth #308

Air Products & Chemicals, Inc.
Booth #107

Alcatel Vacuum Products, Inc.
Booth #302

A.L.E. Systems, Inc.
Booth #500

American Institute of Physics
Booth #928

Amplifier Research
Booth #306

Anatech, Inc.
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Adonian Cryogenics, Inc.
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Atomika
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Bio-Rad
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Blake Industries, Inc.
Booth #805, 806

Cahn Instruments
Booth #915

Callery Chemical Co.
Booth #310

Cambridge Isotope Labs., Inc.
Booth #109

Cameca Instruments, Inc.
Booth #808

CCL Systems
Booth #103

***Ceramaseal**
Booth #710

Cryomagnetics, Inc.
Booth #403

Cryosystems, Inc.
Booth #112

Denton Vacuum
Booth #108

Eaton Corporation
Booth #501, 502

EDAX International
Booth #407

EG & G Princeton Applied Research
Booth #304

Elsevier Science Publishing Co.
Booth #113

Charles Evans & Associates
Booth #309

***Gatan, Inc.**
Booth #607, 608

Gaertner Scientific
Booth #404

GEC Avionics Ltd.
Booth #303

***General Ionex**
Booth #503, 504

Granville-Phillips
Booth #603

***High Voltage Engineering Europa B.V.**
Booth #909

Hitachi Scientific Instruments
Booth #110, 111

Huntington Mechanical Labs.
Booth #904

Innovative Technology
Booth #206

Instruments SA, Riber Div.
Booth #506, 507

***International Scientific Instruments, Inc.**
Booth #508

Ion Beam Technologies
Booth #105

Ion Tech, Inc.
Booth #305

***Janis Research Company**
Booth #902

JEOL USA Inc.
Booth #301

Journal of Materials Research
Booth #929

Keithley Instruments, Inc.
Booth #408

Kevex Corporation
Booth #914

***Kimball Physics Inc.**
Booth #703, 704

Kluwer Academic Publishers
Booth #918

Lake Shore Cryotronics, Inc.
Booth #802

Lambda Physik
Booth #203

***Laser Science, Inc.**
Booth #209, 210

Lecroy Research Systems
Booth #906

Kurt J. Lesker Co.
Booth #701

Leybold-Heraeus Vacuum Products, Inc.
Booth #605, 606

Materials by Metron
Booth #921

Micron Optics, Inc.
Booth #707

***Microscience, Inc.**
Booth #601, 602

MKS Instruments
Booth #807

MMR Technologies
Booth #610

National Electrostatics Corp.
Booth #803

Neslab Instruments, Inc.
Booth #811

Netzsch Inc.
Booth #307

***NGS Associates Inc.**
Booth #409

Nicolet/Xentronics
Booth #106

North Eastern Analytical
Booth #505

Oriel
Booth #925, 926

Oxford Instruments N.A. Inc.
Booth #609

Perkin-Elmer Physical Electronics
Booth #908

Phillips Electronic Instruments & EDAX International
Booth #405, 406, 407

***Photon Technology International**
Booth #907

***Physicon Corporation**
Booth #911

Physitec Corporation
Booth #912

Plasma Therm
Booth #100

***Plenum Publishing Corp.**
Booth #923

Polymer Laboratories
Booth #202

***Princeton Gamma-Tech, Inc.**
Booth #705, 706

Questek, Inc.
Booth #401, 402

Rigaku USA
Booth #509, 510

Rudolph Research
Booth #709

Scintag, Inc.
Booth #924

Semiconductor Processing Co.
Booth #916

Siemens-Allis
Booth #207, 208

Sohio Engineered Materials Co.
Booth #810

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ACTIVITIES LOCATOR

ACTIVITIES LOCATOR

	SUNDAY Dec. 1	MONDAY Dec. 2			TUESDAY Dec. 3			WEDNESDAY Dec. 4			THURSDAY Dec. 5			FRIDAY Dec. 6		SATURDAY Dec. 7
		am	pm	eve.	am	pm	eve.	am	pm	eve.	am	pm	eve.	am	pm	
A. Beam-Solid Interactions		Salon E			Salon C/D		America Ballroom* (WESTIN)	Salon C/D								
B. Rapid Thermal Processing			Salon A/B		Salon A/B		Salon E	Salon A/B								
C. SOI / TFT						Salon H/I			Salon H/I		Salon A/B		America Ballroom* (WESTIN)	Salon A/B		
D. Beam-induced Chemical		Salon E			Salon E		America Ballroom*	Salon E			Salon J/K					
E. Thin Films		Salon F				Salon E	America Ballroom*	Salon F			Salon F		America Ballroom*	Salon F		
F. Polymers		Salon G			Salon G		America Ballroom*	Salon G			Salon G		America Ballroom*	Salon G		
G. Biomedical Materials								America Ballroom* North (Westin)			America Ballroom* North (Westin)			America* BR North		
H. Layered structures and Epitaxy					Salon F			Salon F			Salon E		America Ballroom*	Salon E		
I. Phase Transitions											Salon C/D			Salon C/D		
J. Rapidly Solidified Alloys		Salon C/D			Yarmouth/Vineyard		America Ballroom*	Yarmouth/ Vineyard								
K. O, C, H, N in Silicon			Salon H/I		Salon H/I			Salon H/I			Salon H/I		America Ballroom*			
L. Defect Properties in Hi-Tech Non-Metallics		Salon J/K			Salon J/K		America Ballroom*	Salon J/K								
M. Oxides, Zeolites, Clays in Catalysis		Boston College			Boston College			Boston College								
N. Fractals		Salon A/B	Orleans/ Prov'town		Orleans/ Provincetown		Yarmouth/ Vineyard; Orleans/ Prov'town	Wellesley/ Suffolk								
O. Non-linear Optical									Yarmouth/ Vineyard		Yarmouth/ Vineyard			Yarmouth/ Vineyard		
P. Defects in Glasses			Simmons		Simmons			Simmons								
Q. TEM		Regis			Regis			Regis								
R. Computer-based Microscopic ...								Orleans/ Provincetown			Orleans/ Provincetor	Salon J/K	Salon J/K	Salon J/K		
S. Cement based Composites									Wellesley		Wellesley					
T. Fly Ash, Coal Conversion by-products		Cape Cod/ Hyannis			Cape Cod/ Hyannis			Cape Cod/ Hyannis								
X. Frontiers of Materials Science		America Ballroom* (North) 12:00 - 1:30pm			America Ballroom* (North) 12:00 - 1:30pm			America Ballroom* (North) 12:00 - 1:30pm			America Ballroom* (North) 12:00 - 1:30pm					
Y. Materials Education					Vermont			Vermont								
Conference Registration	4:00 - 9:00 pm	Fourth Floor 7:00 am - 9:00 pm			Fourth Floor 7:30 am - 5:00 pm			Fourth Floor 7:30 am - 5:00 pm			Fourth Floor 7:30 am - 5:00 pm			Fourth Floor 7:30 am - noon		
Job Placement Center					Brandeis/ Northeastern 9:00 am - 5:00 pm			Brandeis/ Northeastern 9:00 am - 5:00 pm			Brandeis/ Northeastern 9:00 am - 5:00 pm					
Short Courses														(See SHORT COURSES announcement)		
Equipment Exhibit					Exhibit area 9:00 am - 5:00 pm			Exhibit area 9:00 am - 5:00 pm			Exhibit area 9:00 am - 2:00 pm					

REGISTRATION 4:00 - 9:00 pm FOURTH FLOOR

6:30 - 7:30 pm VON HIPPEL CEREMONY AWARD AND LECTURE - GRAND BALLROOM, FOURTH FLOOR

7:30 - 8:30 pm WINE AND CHEESE RECEPTION

6:00 pm PLENARY SESSION - GRAND BALLROOM, FOURTH FLOOR Speaker: Gerold Yonas, Chief Scientist, SDI.

* America Ballroom, WESTIN Hotel. (All other rooms are located in the Marriott/Copley Place Hotel.)

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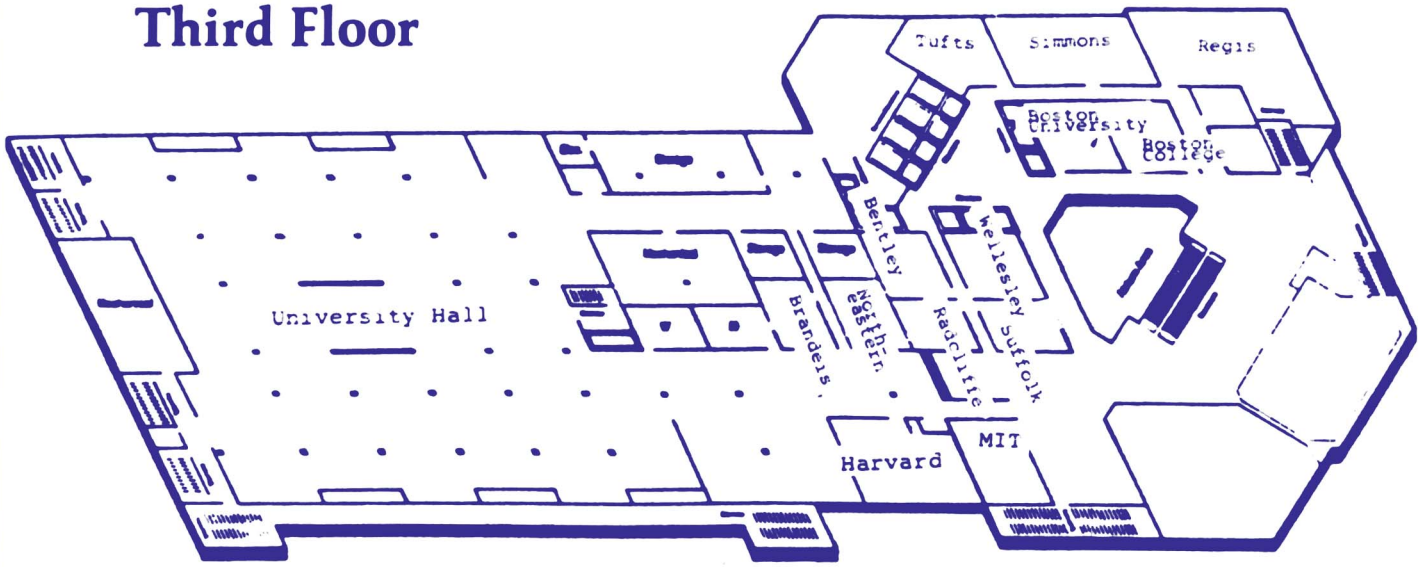
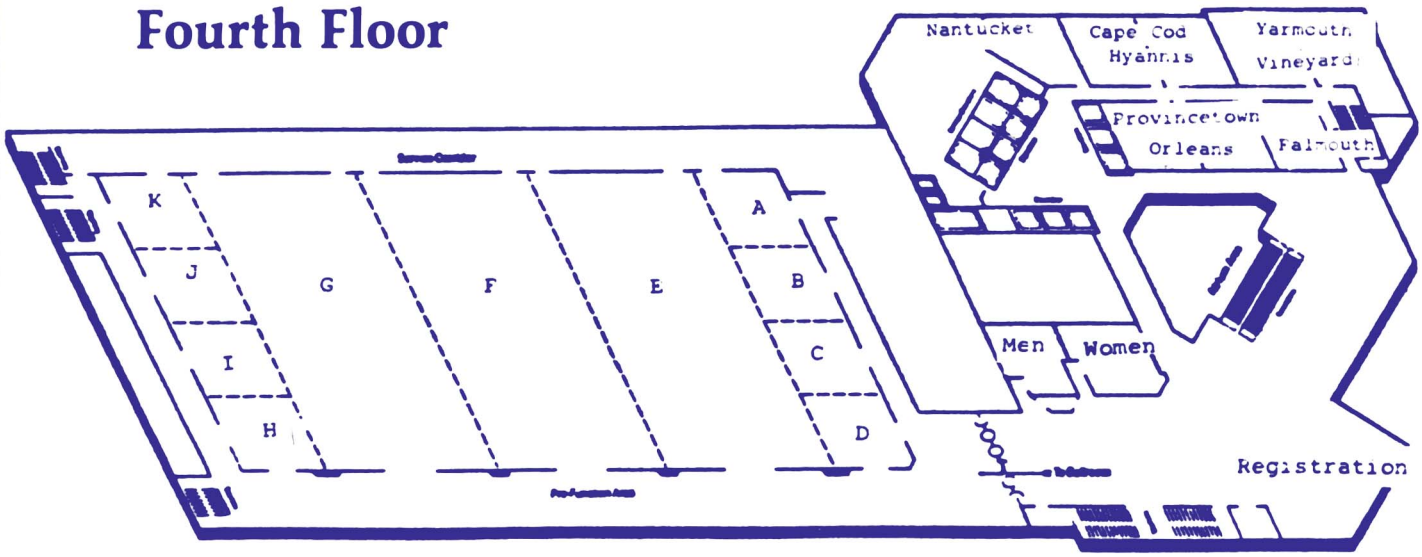
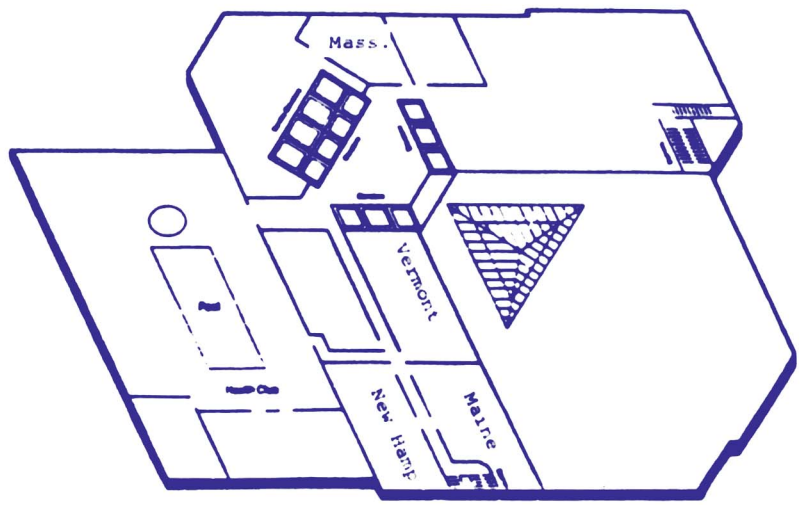
Third Floor



Fourth Floor



Fifth Floor



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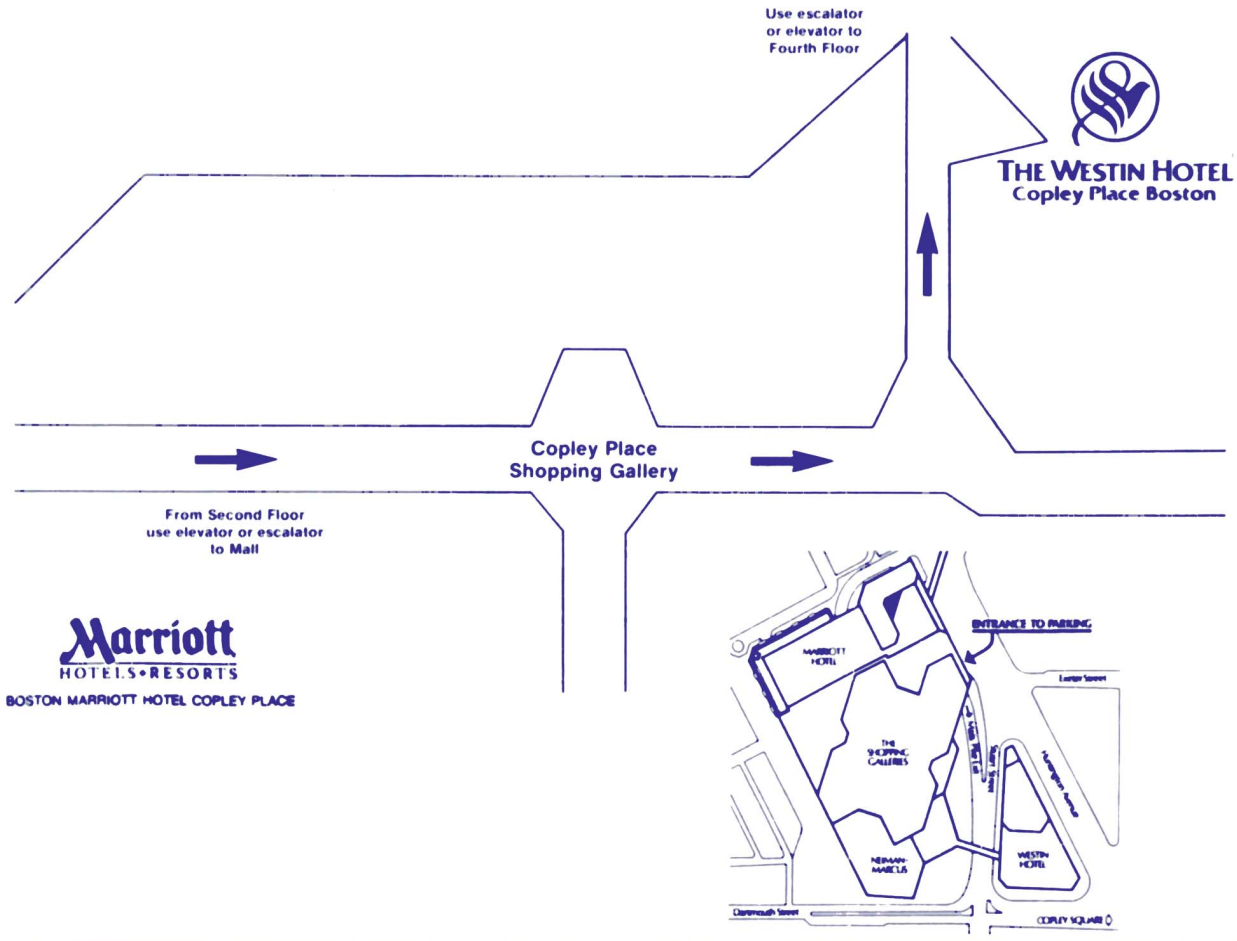
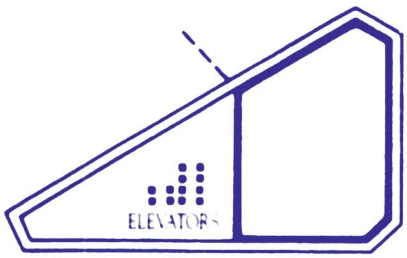
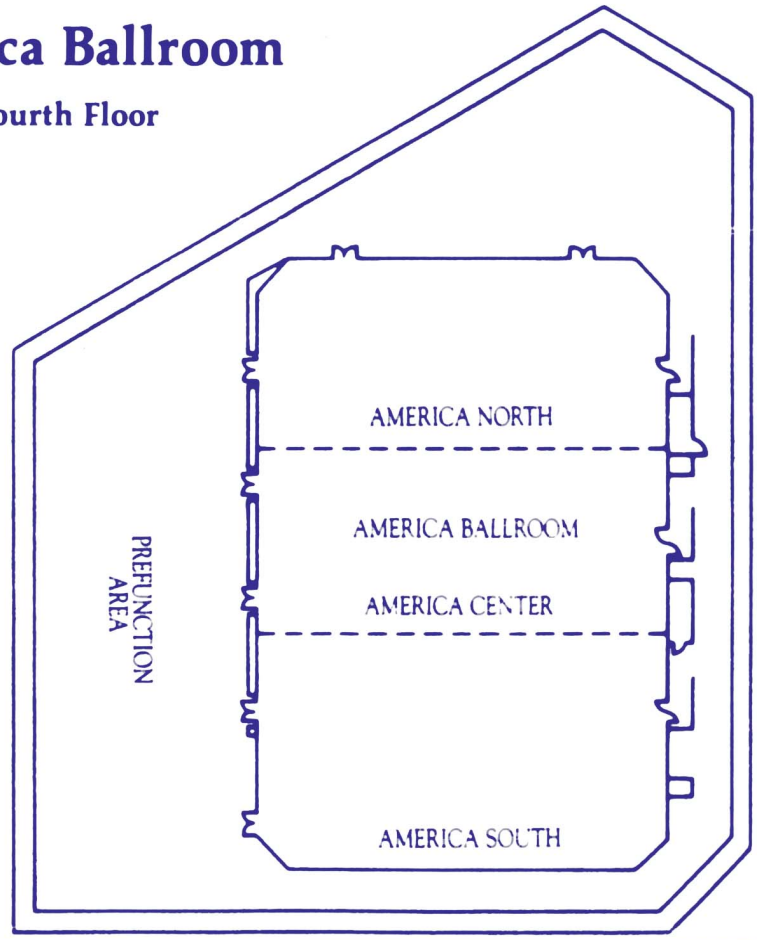


America Ballroom

Fourth Floor





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Proceedings of the 1984 MRS-Europe Meeting

(Strasbourg — June 5-8, 1984)

Poly-Micro-Crystalline and Amorphous Semiconductors

Edited by P. Pinard and S. Kalbitzer

This volume contains 101 papers on two subject areas: (1) structure of grain boundaries via electron microscopy and passivation of these boundaries by hydrogen and other materials and (2) amorphous and micro-crystalline silicon, particularly electronic optical properties, preparation and devices, and structural problems. Invited speakers included: A. Bourret, F. Wald, C. Belouet, J. Revel, E. Sirtl, J. Werner, S. Veprek, L. Ley, G. Austin, D. Weaire, A. Chenevas-Paule, and J. Magarino.

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1985 MRS Fall Meeting Boston, Massachusetts

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BREAKFAST:

Westin Hotel

Brassiere	(1st floor)	6:30 a.m. - 11:00 p.m.

Boston Marriott Copley Place

Singleton's	(2nd floor)	6:30 a.m. - 11:30 a.m.
Gourmelli's	(2nd floor)	6:30 a.m. - 11:30 a.m.

LUNCH:

Westin Hotel

Brassiere	(1st floor)	6:30 a.m. - 11:00 p.m.
Turner Fisheries	(1st floor)	11:30 a.m. - 10:00 p.m.
Symposium X	(4th floor)	11:45 a.m. - 12:30 p.m.
offers a cash snack bar for Symposium X attendees		

Boston Marriott Copley Place

Singleton's	(2nd floor)	11:30 a.m. - 2:30 p.m.
Gourmelli's	(2nd floor)	11:30 a.m. - 2:00 p.m.
Terrace Bar	(2nd floor)	11:30 a.m. - 2:00 p.m.
Exhibit Hall	(3rd floor)	offers a cash snack bar consisting of lunch items exclusively for MRS members Tuesday, Wednesday and Thursday.

DINNER:

Westin Hotel

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Turner Fisheries	(1st floor)	11:30 a.m. - 10:00 p.m.
Ten Huntington	(2nd floor)	6:00 p.m. - 10:00 p.m.

Boston Marriott Copley Place

Singleton's	(2nd floor)	5:00 p.m. - 10:30 p.m.
Gourmelli's	(2nd floor)	5:00 p.m. - 9:00 p.m.
Speedwell's	(2nd floor)	5:00 p.m. - 10:00 p.m. (Monday - Thursday) 6:00 p.m. - 11:00 p.m. (Friday - Saturday)

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NEW SHORT COURSES

In Conjunction With 1986 MRS Spring Meeting

The Materials Research Society will offer a series of intensive short courses in conjunction with the 1986 MRS Spring Meeting in Palo Alto, California during the week of April 15-19. The tentative program will feature approximately 8 new courses in addition to some of the currently popular MRS courses. Some courses will be offered as "packages" over the five-day period.

New courses which may be offered in the Spring program include:

- Microelectronic Packaging Technology
- Plasma Etching for Microelectronic Fabrication
- Computer Assisted X-Ray Diffraction Analysis
- Analytical Electron Microscopy
- Design and Application of Vacuum and Plasma Processing Systems
- Plasma Deposition
- Technology of Handling Hazardous Gases
- Contamination Control for the Microelectronics Industry

Popular current MRS courses may also be offered:

- Liquid Phase Epitaxy
- Vapor Phase Epitaxy
- Molecular Beam Epitaxy
- Ion Implantation/Rapid Thermal Annealing
- Films and Coatings for Engineering Applications
- Surface and Thin Film Analysis

A descriptive Short Course Program brochure and course outline is available from MRS Headquarters. Or look in the upcoming issue of the **BULLETIN** for complete details of the program.

Direct inquiries to: Michael Alberty, Materials Research Society, 9800 McKnight Road, Suite 327, Pittsburgh, PA 15237; Telephone (412) 367-3003

PLEASE GIVE MRS YOUR OPINION

We hope that you find the 1985 MRS Fall Meeting to be a stimulating forum and a valuable source of information for your research interests. Please take a few minutes and help MRS plan future meetings that will continue to serve your needs and those of your colleagues. Keep in mind that the Society focuses on interdisciplinary areas in materials research of current or growing interest.

Symposium Topic	Suggested Symposium Organizer	Affiliation and Telephone No.
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

I am interested in organizing a symposium:

Topic _____

Name _____ **Affiliation** _____

Other comments about MRS meetings or this meeting in particular

_____

_____

Please return this form to the Registration area in the Boston Marriott or mail to: John B. Ballance, Materials Research Society, 9800 McKnight Road, Suite 327, Pittsburgh, PA 15237.

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C	Semiconductor on Insulator and Thin Film Transistor Technology	$32	$38	$43		
E	Thin Films—Interfaces and Phenomena	$39	$47	$52		
G	Biomedical Materials	$33	$40	$45		
H	Layered Structures and Epitaxy	$34	$41	$46		
I	Phase Transitions in Condensed Systems—Experiments and Theory	$32	$38	$43		
J	Rapidly Solidified Alloys and Their Mechanical and Magnetic Properties	$28	$34	$39		
K	Oxygen, Carbon, Hydrogen, and Nitrogen in Crystalline Silicon	$32	$38	$43		
L	Defect Properties and Processing of High-Technology Nonmetallic Materials	$33	$40	$45		
P	Defects in Glasses	$28	$34	$39		
Q	Materials Problem Solving with the Transmission Electron Microscope	$33	$40	$45		
R	Computer-Based Microscopic Description of the Structure and Properties of Materials	$30	$36	$41		
S	Cement-Based Composites: Strain Rate Effects on Fracture	$24	$30	$35		
T	Fly Ash and Coal Conversion By-Products: Characterization, Utilization and Disposal II	$24	$30	$35		
Y	Frontiers in Materials Education	$24	$30	$35		
	EXTENDED ABSTRACTS					
D	Beam Induced Chemical Processes	$5	$7	$7		
N	Fractal Aspects of Materials	$5	$7	$7		
O	Nonlinear Optical Materials	$5	$7	$7		
					TOTAL	

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*Special Prices for MRS Members and 1985 Fall Meeting Attendees Only**

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	TO BE PUBLISHED EARLY 1986			
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*Member price after December 16, 1985 is $50.00.

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