

# Call for Papers: 1988 MRS Spring Meeting

The 1988 Spring Meeting of the Materials Research Society will be held April 5-9 at the Bally Grand Hotel in Reno, Nevada. This year's meeting will feature 15 technical symposia, a short course program of approximately 22 courses, an equipment exhibit, and a job placement center. MRS extends a broad invitation to materials scientists and engineers to participate in all aspects of the meeting.

The symposia will share a common goal of discussing new materials developments, new characterization methods, or new process technology. Each symposium will provide a forum for exchanging ideas at the forefront of research with experts in the field. Topics will be treated at a sophisticated level, in an interdisciplinary way, so all possible physical, chemical, and engineering insights can be considered.

Papers which will contribute to the state of knowledge in a given area are solicited for all symposium topics. The topics for each symposium are described below. For additional information on a specific symposium, contact the symposium organizers listed at the end of the description for each symposium.

Abstracts are to be prepared in the **new MRS abstract format** and submitted to the organizers of the individual symposia. Except for Symposium K, the **deadline for abstracts** to be in the hands of the symposium organizers is **October 1, 1987**. The deadline for Symposium K only is January 10, 1988.

For general information on the technical program, contact any of the Program Chairs:

## David E. Clark

Department of Materials Science  
& Engineering  
University of Florida  
Gainesville, FL 32611  
(904) 392-7660

## Clif Draper

AT&T Engineering Research  
P.O. Box 900  
Princeton, NJ 08540  
(609) 639-2350

## C. T. Liu

Oak Ridge National Laboratory  
P.O. Box X  
Oak Ridge, TN 37831  
(615) 574-4459

### Symposium A

#### Heteroepitaxy on Silicon:

#### Fundamentals, Structures, and Devices

This symposium will expand the scope of previous MRS symposia on heteroepitaxial growth on silicon by addressing fundamental phenomena of epitaxial growth and investigating specific materials and device systems. Particular emphasis will be placed on: emerging new heteroepitaxial combinations; progress of GaAs/Si, GeSi/Si and epi-

taxial fluorides and silicides; developments in fundamental understanding, materials growth, and characterization; and emerging device applications such as monolithic III-V/Si integration, and high temperature wide bandgap semiconductor technologies. Contributions are solicited in the following and related fields:

- Fundamentals of heteroepitaxial growth on Si
- Growth and characterization of heteroepitaxial layers on Si III-V and II-VI compounds on Si
- Group IV heteroepitaxy (GeSi/Si, SiSn/Si) and high temperature wide bandgap semiconductors such as SiC/Si
- Epitaxial metals and insulators on Si
- Novel devices in heteroepitaxial structures on Si
- Monolithic GaAs/Si integration

Send abstracts to R.J. Nemanich at the address below.

#### Symposium Organizers:

Hong K. Choi  
Lincoln Laboratory  
Massachusetts Institute of Technology  
244 Wood Street  
Lexington, MA 02173  
(617) 863-5500, Ext. 4457

Robert Hull  
AT&T Bell Laboratories  
600 Mountain Avenue  
Murray Hill, NJ 07974  
(201) 582-3000

Hiroshi Ishiwara  
Tokyo Institute of Technology  
4259 Nagatsuda  
Yokohama 227, Japan  
011-81-45-922-1111, Ext. 2552

Robert J. Nemanich  
Department of Physics  
North Carolina State University  
Raleigh, NC 27695-8202  
(919) 737-3225

### Symposium B

#### Materials for

#### Controlled-Release Environments

This symposium will highlight recent developments in materials for controlled-release application. It will be interdisciplinary, emphasizing scientific and engineering developments in polymer science, ceramics, and metals that are important in the design of controlled-release systems in pharmaceuticals, agriculture, and environmental science. Areas of interest include transdermal and implantable drug delivery systems, pesticide and animal health care products, environmental reclamation, sensors, diagnostics, and lithography. Contributions are solicited in the following areas:

- Diffusion in polymers
- Biodegradable/bio-erodible polymers

- Swelling of polymers in biological fluids
- Transdermals
- Ceramic and metal-based controlled release
- Bioadhesion and biological surface interactions with materials
- Biosensors
- Materials effects on protein stability

#### Symposium Organizers:

Kristine Knutson  
Department of Pharmaceutics  
University of Utah  
Salt Lake City, UT 84112  
(801) 581-4426

Robert Langer  
Room 342, Whitaker Health Science Building  
Massachusetts Institute of Technology  
Cambridge, MA 02139  
(617) 253-3107

Ronald A. Siegel  
School of Pharmacy, 926-S  
University of California  
San Francisco, CA 94143  
(415) 476-5194

### Symposium C

#### Process Diagnostics

Materials and process development is often done using the Edisonian approach of varying one process parameter at a time and observing changes in some desired material property. As processes (e.g. microelectronic fabrication) increase dramatically in their complexity, the validity of this method is called into question, particularly in light of new diagnostic techniques which provide a microscopic view of atomic and molecular interactions. This symposium is designed to bring together scientists and engineers who are attempting to obtain a fundamental understanding of processes occurring in the gas phase and at gas/solid and gas/liquid interfaces. Its goal is to create a dialogue between scientists and engineers who are already using sophisticated diagnostic techniques to study combustion and magnetic confinement fusion processes and material scientists who wish to increase their understanding of how process parameters affect microelectronic fabrication, coating technologies, and ceramic and metallurgical processing.

Contributions are solicited in the following areas:

- Process diagnostics for microelectronics fabrication (PVD, CVD, PECVD, plasma etching...)
- Process diagnostics for industrial coating technologies (plasma spraying, PVD, CVD, PECVD...)
- Diagnostics for ceramic and metallurgical processing (powder synthesis, welding, melting, refining, surface modification...)
- Combustion diagnostics (internal combus-

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tion engines, rocket engines, explosive detonations...)

• Magnetic confinement fusion diagnostics (plasma-surface interactions, edge diagnostics...)

*Symposium Organizers:*

Kay Hays  
Division 1831  
Sandia National Laboratories  
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(505) 844-9996

Alan Eckbreth  
United Technologies Research Center  
Silver Lane  
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(203) 727-7269

Greg Campbell  
Center for Plasma Physics & Fusion  
Engineering  
University of California  
Los Angeles, CA 90024  
(213) 825-3419 or (818) 841-4094

**Symposium D  
Diamond and Diamond-Like  
Materials Synthesis**

Over the past 30 years, researchers have synthesized single-phase diamond films using thermal-, catalyst-, photon (UV)-, and electron-assisted CVD; rf- and microwave-plasma-assisted CVD and sputtering techniques. Polycrystalline and continuous single phase diamond films, as well as diamond crystals, have been deposited using a variety of hydrocarbon gases.

This symposium will focus on these films' physical and chemical properties, as well as their performance properties in potential applications. These properties will be discussed as a function of the deposition techniques and their parameters. The roles of plasma chemistry, nonequilibrium kinetics, and film morphology and characterization will also be addressed.

Speakers should submit five copies of their abstracts.

*Symposium Organizers:*

George H. Johnson  
Electronic Specialties Laboratory  
Philips and Du Pont Optical Company  
E.I. du Pont de Nemours & Company  
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Michael Geis  
Lincoln Laboratory  
Massachusetts Institute of Technology  
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Andrzej Badzian  
Materials Research Laboratory  
Pennsylvania State University  
University Park, PA 16802  
(814) 863-1967

**Symposium E  
Amorphous Silicon Technology**

This symposium will be devoted to materials issues related to applications to amorphous semiconductors, including amorphous silicon-based alloys. Specific issues will include structure, electronic and optical properties, defects, interfaces, contacts, heterostructures, nonequilibrium behavior, and stability. Applications will include solar cells, electro-photography, switching, electronic and optical memories, image sensors, scanners, thin-film transistors, vidicons, large-area displays, portable computers, and new types of devices. Presentations will focus on the electronic density of states and its relationship to technological figures of merit for each application, fundamental and materials limitations, yield, reproducibility, reliability, and stability.

Papers are solicited, but not limited to the following areas: structure, optical properties, electronic properties, defects, contacts, interfaces, heterostructures, nonequilibrium properties, solar cells, electrophotography, switching, electronic memories, optical memories, computers, large-area displays, vidicons, image sensors, scanners, novel devices, stability, transient behavior, alloys.

Send abstracts to A. Madan at the address below.

*Symposium Organizers:*

Y. Hamakawa  
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1-1 Machikaneyama  
Toyonaka, Osaka 560  
Japan

P.G. LeComber  
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Carnegie Laboratory of Physics  
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44-382-23181

A. Madan  
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Palo Alto, CA 94304  
(415) 494-4561

**Symposium F  
Adhesion in Solids**

Adhesion of surfaces in contact is of interest to those seeking a fundamental understanding of metals, polymers, superconductors, semiconductors, and ceramics and their applications. This symposium will

bring together scientists and engineers to promote the dissemination of ideas, theories, and facts relating to adhesion, adhesion failure, and adhesion promoting or preventing processes. General areas of interest include: interface structure and characterization; mechanics and fracture of interfaces; degradation of adhesion (e.g. corrosion, diffusion); thin film formation—nucleation, interface formation, film properties; modification of surfaces and interfaces to promote or prevent adhesion; techniques for measuring and evaluating adhesion.

Contributions are solicited in such areas as:

- Adhesion or corrosion layers
- Ion beam processing
- Device contacts
- Real-time fracture analysis
- Plasma treatment of polymer surfaces
- Device packaging
- Friction of ceramic surfaces
- Degradation of metal-polymer interfaces
- Coating adhesion in mechanical applications
- Sintering of powders
- Environmental effects on wear
- Adsorption and nucleation of surfaces
- Diffusion at interfaces
- Bioadhesion
- Fine particle adhesion

*Symposium Organizers:*

D.M. Mattox  
1834 Surface and Interface Technology  
Sandia National Laboratories  
Albuquerque, NM 87185  
(505) 844-7632

Chris Batich  
Materials Science & Engineering Dept.  
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Gainesville, FL 32611  
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J.E.E. Baglin  
IBM Almaden Research Center  
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650 Harry Road  
San Jose, CA 94120-6099

R.J. Gottschall  
ER 131:MS G236/GTN  
Division of Materials Sciences USDOE  
Washington, DC 20545  
(301) 353-3428

**Symposium G  
High Temperature/High Performance  
Composites**

This symposium will bring together researchers from widely dispersed fields to compare their latest results concerning the synthesis, structure-property relationships, and mechanics of metal, intermetallic, glass, and ceramic matrix composites. Both artificial and *in situ* reinforced composites (produced by co-deformation, controlled-eutectic solidification, and reactively formed

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reinforcements) will be addressed. The reinforcement formats comprise continuous filaments, whiskers, and particulates.

Contributions are solicited in the topical areas described above. Emphasis will be placed on new methods of preparation and characterization, new material systems, composition-property relationships, and process effects on properties.

Submit abstracts to F.D. Lemkey at the address below.

*Symposium Organizers:*

F.D. Lemkey  
United Technologies Research Center, MS 25  
E. Hartford, CT 06108  
(203) 727-7318

A.G. Evans  
Eng. II, Rm. 1355  
University of California  
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(805) 961-3141

S.G. Fishman  
Office of Naval Residence  
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Arlington, VA 22217  
(202) 696-4401

J.R. Strife  
United Technologies Research Center, MS 24  
E. Hartford, CT 06108  
(203) 727-7270

### Symposium H

#### Better Ceramics Through Chemistry III

This symposium will address the synthesis, structure and new applications of chemically derived ceramic materials. The first sessions will address the chemistry and structure of ceramic precursors. Subsequent sessions will address forming these substances into gels, films, powders, or fibers, and conversion to glasses, ceramics, or composites. Recent results on films and coatings will also be emphasized. A session on chemical processing of high temperature superconductors has been tentatively planned. Contributions are solicited in the following areas:

- Synthesis and chemistry of ceramic precursors
- Chemical routes to gels, powders, films or fibers
- Structure and structure-property relationships
- Advances in materials characterization
- Films and coatings: synthesis, structure and applications
- Theoretical modeling: MO/MD calculations, computer simulations
- Joining: sealing and repair
- Processing of high temperature superconductors

Submit two copies of the abstract to C. Jeffrey Brinker at the address below.

*Symposium Organizers:*

C. Jeffrey Brinker  
Div. 1846

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(505) 846-3552

D.E. Clark  
Dept. of Materials Science & Engineering  
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(904) 392-7660

Don R. Ulrich  
Air Force Office of Scientific Research  
Bolling Air Force Base  
Washington, DC 20332  
(202) 767-4963

### Symposium J Science and Technology of Refractory Alloys

Interest in refractory metals for advanced engineering systems and electronic applications has grown substantially in the last few years. To date, this interest has expanded without the benefit of timely symposia on these applications and the new base of applied and fundamental knowledge that has been generated over the past decade. This symposium will focus on new applications and determine the state of knowledge. Contributions are solicited in the following areas:

- Current and anticipated applications, such as electronics and aerospace (e.g., propulsion, reentry), space power, fusion and other radiation environments, VLSI metallization, specialized applications (e.g., capacitors, filaments, heating elements, electrodes, x-ray targets)
- Applied technology considerations, such as: processing (e.g., joining, forming, machining, melting, PM), coatings (e.g., PVD, CVD, sputtering, slurry fusion, diffusion barriers), environmental reactions and compatibility (e.g., oxidation, atomic oxygen, hydrogen, inert gases, high vacuum, alkali metals, propulsion gases, liquid and solid propellants)
- Fundamental topics, such as: alloy design, diffusion, microstructural control, deformation and fracture mechanisms, gas-metal interactions, phase equilibrium, reaction kinetics (e.g., silicide formation), thermal, electrical, electronic and optical properties, solidification phenomena

*Symposium Organizers:*

Roy H. Cooper, Jr.  
Oak Ridge National Laboratory  
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Ronald Gibala  
Dept. of Materials Science & Engineering  
University of Michigan  
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Charles M. Packer  
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Jeffrey Wadsworth  
Lockheed Palo Alto Research Center  
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Palo Alto, CA 94304-1191  
(415) 424-2234

### Symposium K

#### High Temperature Superconductors

This symposium will provide a multidisciplinary forum focused on the exciting new developments in high temperature superconductivity. Contributions are solicited in the following areas:

- Superconducting properties ( $T_c$ ,  $H_{c2}$ ,  $J_c$ , etc.)
- Electron-electron coupling mechanisms and prospects for higher  $T_c$ S
- Materials properties and microstructure
- Processing, fabrication and characterization
- Current and future applications

Contributing speakers should submit five copies of abstracts to D. Capone by January 10, 1988.

*Symposium Organizers:*

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W.H. Butler  
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Don Capone  
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(312) 972-5526

Paul C.W. Chu  
Department of Physics  
University of Houston  
Houston, TX 77004  
(713) 749-2842

### Symposium L

#### Materials Issues in Art and Archaeology

*Cosponsored by the Getty Conservation Institute and Conservation Analytical Laboratory, Smithsonian Institution*

The methods and analytical techniques of materials science have been central to advances in art history, archaeology and conservation. Recent developments in materials research have been applied to problems such as authenticity, preservation, dating, provenance, raw materials sourcing, and understanding the diversity and complexity of ancient technologies. In addition, there is a growing body of research data on ancient

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technology which has developed within the field of archaeometry on systems which should be of interest to university or industrial materials researchers.

Contributions are solicited in the following areas:

- Technical methods of examining and characterizing artifacts and works of art (e.g., materials characterization and methods of analysis in art and archaeology, in particular nondestructive and microsampling techniques)
- Technical studies of the technologies of ancient and historic manmade materials (e.g., metals, ceramics and polymers), including investigation of properties, reconstruction of processing, characterization of macro- and microstructure, role of technology in social evolution, interaction of technologies, processes of technological innovation and development
- Deterioration of natural, ancient and modern glasses: models, mechanisms and treatment

Submit three copies of camera-ready abstracts.

*Symposium Organizers:*

Edward V. Sayre and Pamela Vandiver  
Conservation Analytical Laboratory  
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(202) 287-3700

James Druzik  
Getty Conservation Institute  
4503 Glencoe Avenue  
Marina Del Rey, CA 90292  
(213) 822-2299

Christopher Stevenson  
Archaeological & Historical  
Consultants, Inc.  
P.O. Box 182  
Boalsburg, PA 16827  
(814) 466-7549

### **Symposium M**

#### **Microwave Processing of Materials**

*Endorsed by the American Ceramic Society*

This is the first major international symposium on the use of microwave energy applied to materials processing, including industrial applications. Speakers will highlight progress and recent developments in the microwave processing of materials and products from research, development, and production viewpoints. Contributions are solicited in such areas as:

- Fundamentals of microwaves/materials interactions and modeling; microwave-microstructure-property relationships
- Application of M/W to inorganic materials, including ceramics, glasses, glass-ceramics, non-oxides, composites, minerals
- Application of M/W to organic materials, including: polymers, adhesives, rubber, textiles, forest products, and food
- Application of M/W to medical and biological systems

- Examples of technological applications of the above, including reclamation and pollution control

*Symposium Organizers:*

Merton H. Brooks  
Sandia National Laboratories  
Division 7472  
Albuquerque, NM 87115  
(505) 844-6800

Irving J. Chabinsky  
I.J.C. Technologies, Inc.  
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(617) 263-7911

Willard H. Sutton  
United Technologies Research Center  
MS-24, Silver Lane  
East Hartford, CT 06108  
(203) 727-7639

### **Symposium N**

#### **Materials Stability and Environmental Degradation**

This symposium will focus on scientific advances in understanding the mechanisms of corrosion and degradation of such materials as metals, glass and ceramics, polymers, and composites. Topics of interest include the dependence of rates and mechanisms of environmental degradation on materials composition and fabrication as well as on environmental conditions.

Contributions are solicited in the general area of mechanisms of degradation, dissolution, stress corrosion, and oxidation, as well as the development of materials of high stability in specific environments, including:

- Ceramics and alloys for high temperature applications
- Homogenous and composite structural materials
- Optical components and fibers based on oxide and non-oxide glasses
- Radiation-resistant alloys and ceramics
- Materials with high biological stability for environmental and biomedical applications
- Natural, ancient and modern glasses, ceramics, and metals

*Symposium Organizers:*

L.R. Smith  
Polymer Division, Rm. A305  
National Bureau of Standards  
Gaithersburg, MD 20899  
(301) 975-6762

E. Verink  
706 Clopper Rd., Apt. 22  
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(301) 975-6027

A. Barkatt  
Vitreous State Laboratory  
Catholic University of America  
Washington, DC 20064  
(202) 635-5522

### **Symposium P**

#### **Advanced Surface Processes for Optoelectronics**

Major advances in preparing and processing material surfaces could significantly influence the future of optoelectronics. This symposium will bring together researchers from a variety of disciplines who are involved in the various aspects of modifying and preparing surfaces with desired electronic and optical properties. Contributions are solicited in the following areas:

- Focused ion beams for direct doping, etching and deposition
- Enhancement of intermixing of superlattice layers by introduction of dopants
- Ion-implanted waveguides in insulators and semiconductors
- Beam-induced etching of optoelectronic structures
- Beam-enhanced epitaxial growth
- Ion implantation and RTA in III-V materials
- Optoelectronics on silicon (oxides, nitrides, epi-insulators and compound semiconductors)
- Strained layer superlattices
- Novel ohmic contacts to III-V materials
- Passivation layers for devices
- Fabrication of ultrasmall structures
- *In situ* processing

*Symposium Organizers:*

T. Venkatesan  
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S. Bernasek  
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G. Stillman  
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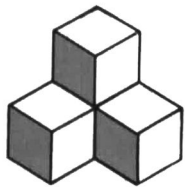
H. Temkin  
Rm. 7A-213  
AT&T Bell Laboratories  
Murray Hill, NJ 07974  
(201) 582-3185

### **1988 MRS Spring Meeting**

**April 5-9**

**Reno, Nevada**





# SHORT COURSE PROGRAM

1987 MRS Fall Meeting

November 30-December 5  
Boston, Massachusetts

A roster of 29 short courses on advanced materials research techniques will complement the technical program at the 1987 MRS Fall Meeting. The courses have been scheduled to give short course attendees time to participate in symposia with parallel topics. Individuals registered for two or more short course days may attend the 1987 MRS Fall meeting at the special fee of \$50.

Space in the short courses is limited ..... register early!

	<u>Courses</u>	<u>Date</u>	<u>Instructors</u>	<u>Tuition*</u>
NEW	Conventional and High Temperature Superconductors	Nov. 29	T.P. Orlando	\$270
	Crystalline Polymers	Dec. 4	D.H. Reneker	320
	Liquid Phase Epitaxy Techniques	Nov.30-Dec. 1	L.R. Dawson	485
	Molecular Beam Epitaxy	Dec. 4-5	G.W. Wicks	485
	Vapor Phase Epitaxy	Dec. 2-3	P.D. Dapkus and H.M. Cox	485
	Film Formation, Adhesion, and Surface Preparation	Dec. 4	D.M. Mattox	320
	Plasma Enhanced CVD of Thin Films for Microelectronics	Nov. 30	R. Reif	320
	Implantation and Diffusion	Dec. 4	T.E. Seidel	320
	Rapid Thermal Processing	Dec. 5	T.E. Seidel and S.C. Shatas	320
NEW	Photon-Controlled Processing for Microelectronics	Dec. 4	R.M. Osgood, Jr.	320
	Silicon Epitaxy: Present and Future	Dec. 4	R. Reif	320
	Plasma Etching for Microelectronic Fabrication	Dec. 3	G.K. Herb	320
	Ion Beam Processes for Materials Modification	Dec. 4	J.K. Hirvonen	320
	Microelectronic Packaging: Materials, Processing, and Reliability	Dec. 3-5	S.K. Prasad and R.K. Shukla	710
	Modern Materials Analysis Techniques	Nov. 30-Dec. 2	J.A. Borders, K.H. Eckelmeyer, and S.H. Weismann	740
	Electron Microscopy of Thin Films	Dec. 4-5	A.D. Romig, Jr. and D.B. Williams	485
	Surface and Thin Film Analysis	Dec. 4-5	L.C. Feldman and J.W. Mayer	510
	Characterization of Films, Coatings, and Surfaces	Dec. 5	D.M. Mattox	320
	Application of Reflection Electron Diffraction to Epitaxial Growth	Dec. 3	P.I. Cohen	320
	Deep Level Transient Spectroscopy	Nov. 30	C.E. Barnes	320
	Fractals in Materials Science	Nov. 30	J.E. Martin and A.J. Hurd	320
NEW	Characterization of Powders and Porous Materials	Nov. 30-Dec. 1	D.M. Smith and J.E. Shields	485
	IC Failure Mechanisms and Analytical Techniques	Dec. 2-3	G. Riga	485
NEW	Atom Probe Microanalysis: Applications to Materials Problems	Dec. 3-4	G.D.W. Smith and M. K. Miller	510
	Scanning Tunneling Microscope: Theory and Practice	Nov. 30	R.J. Hamers	320
NEW	Nuclear Magnetic Resonance Spectroscopy	Dec. 2	J.P. Yesinowski	320
	Scanning Electron Microscopy and X-Ray Microanalysis	Dec. 1	D.C. Joy and D.E. Newbury	340
	Experimental Strategies for Optimizing Process Variables	Dec. 1-4	D.H. Doehlert	850
	Vacuum and Plasma Technology for Materials Processing	Dec. 1-2	D.M. Mattox	485

\*Tuition discounts are available to registrants attending certain groups of courses and to students. All registrations made after November 16, 1987 will be \$25 higher for each course. For further details or to register, contact:

**Materials Research Society, 9800 McKnight Road, Suite 327, Pittsburgh, PA 15237; telephone (412) 367-3003.**