

**PRELIMINARY ANNOUNCEMENT
AND
CALL FOR PAPERS**

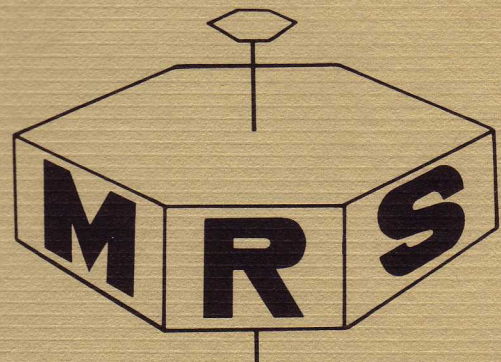
MATERIALS RESEARCH SOCIETY
102C Materials Research Laboratory
University Park, PA 16802

MATERIALS RESEARCH SOCIETY

ANNUAL MEETING

November 16-21, 1980

Copley Plaza Hotel
Boston, Massachusetts



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PRELIMINARY ANNOUNCEMENT

A series of interdisciplinary, topical symposia will be held at the annual Materials Research Society Meeting in the Copley Plaza Hotel, Boston, Mass., November 16-21, 1980. The symposia will be conducted concurrently with the common goal of discussing new materials development, new characterization methods or new process technology. Each symposium will provide a forum for exchange of ideas at the forefront of research by experts in the field and topics will be treated at a sophisticated level, in an interdisciplinary way, so all possible physical, chemical and engineering insights can be considered.

The symposia for this year's meeting have been conceptually structured in four major areas: electronic materials, energy materials, materials analysis, new and special materials.

Descriptions of each symposium and deadline and abstract information are given in the following pages. Unless specified otherwise in any of the information regarding individual symposia, the deadline for abstracts to be in the hands of the symposium chairperson is July 1 in the format detailed on page 11.

For information on specific symposia, contact the respective symposia chairpersons. For general program information contact either of the program chairpersons:

| | |
|----------------------------|-----------------------|
| K.N. Tu | C.J. Northrup |
| IBM Research Center | Sandia Laboratories |
| Yorktown Heights, NY 10598 | Albuquerque, NM 87175 |
| 914/945-1602 | 505/264-5650 |

For general information concerning the annual meeting contact:
Materials Research Society Secretariat
Ernest M. Hawk, Executive Secretary
102C Materials Research Laboratory
University Park, PA 16802
814/865-3424

SYMPOSIUM A

LASER AND ELECTRON-BEAM SOLID INTERACTIONS AND MATERIALS PROCESSING

The purpose of this symposium is to provide an interdisciplinary forum for the presentation of basic research and new technological developments in the rapidly expanding field of transient energetic beam interaction and processing of electronic materials. The three-day symposium will consist of both invited and contributed papers and posters. Subjects of interest for contributed papers include, but are not limited to:

- Annealing of Ion Implant Damage
- Annealing and Recrystallization Mechanisms
- Rapid Solidification and Crystal Growth
- Thin Film Polycrystal Formation
- Metastable or Supersaturated Solid Solutions
- Thin Films, Silicides and Alloys
- Electrical Properties, Defects and Device Application

Invited speakers will include:

W. L. Brown, Bell Laboratories (Fundamental Mechanisms)
R. F. W. Pease, Stanford (Electron Beam Solid Interaction)
L. D. Hess, Hughes Research (Elemental Semiconductors)
J. S. Williams, RMIT, Melbourne (Compound Semiconductors)
J. F. Gibbons, Stanford (Device Applications)
J. A. Roth, Hughes (UHV Deposited Thin Films)
T. W. Sigmon, Stanford (Silicides)
J. W. Mayer, CalTech (Intermetallic Compounds)
J. C. C. Fan, Lincoln Labs (Compound Semiconductor Device Application)

and others to be announced.

Those wishing to have a paper considered for presentation at the Symposium must send ten copies of a *summary* of their paper, plus any extra supporting data they would like considered, to one of the program chairmen. The *summary* must be confined to an area 7'' (17.78 cm) wide by 7½'' (19.37 cm) long. (Instructions enclosed.) The summary should be in a form suitable for reproduction. The summaries of *accepted* papers will be reproduced verbatim in the conference program. The *Deadline* for receipt of these summaries is July 1, 1980. The summary should include the authors' names, affiliation, and address.

A *limited* number of late news papers may be considered up to the conference date depending on their timeliness and unique character.

Please notice that the Symposium plans to publish full length papers of all presented material as a Symposium Proceedings. Authors will be notified after July 1, 1980 of both acceptance and further manuscript preparation.

Summaries should be sent to:

| | |
|-------------------------|-------------------------------|
| L. D. Hess | J. F. Gibbons or T. W. Sigmon |
| Hughes Research Labs | Stanford Electronics Labs |
| 3011 Malibu Canyon Road | McCullough Building |
| Malibu, CA 90265 | Stanford, CA 94305 |
| (213) 456-6411 | (415) 497-4659 or 497-0983 |

SYMPOSIUM B

DEFECTS IN SEMICONDUCTORS

The purpose of this symposium is to address new advances in defect characterization techniques and fundamental aspects of defects in semiconductors. We hope to bring together physicists, materials scientists and engineers engaged in characterization of point and extended defects in semiconductors and in correlation of these defects with physical properties. Attention will be focussed on ion implantation, electron and neutron damage, and defects associated with crystal growth and various device fabrication processes.

A tentative list of speakers includes:* G.D. Watkins (Lehigh University), J.W. Corbett (SUNY/Albany), A. Seeger (Max-Planck-Institut/Stuttgart), P.B. Hirsch (University of Oxford/England), J. Washburn (University of California/Berkeley), J.R. Patel (Bell Labs.), A. Howie (University of Cambridge/England), J. Chikawa (BSR Labs./Japan), W. K. Chu (IBM), B.R. Appleton (ORNL), L.C. Kimmerling (Bell Labs.), S.T. Picraux (Sandia Labs.), T.Y. Tan (IBM), S.M. Hu (IBM), D.M. Maher (Bell Labs.), W.K. Tice (IBM), A.G. Cullis (RRE/England), P. Petroff (Bell Labs.).

*More names of invited speakers will be announced later.

The contributed papers should be submitted under the following categories:

- I. Defect Characterization Techniques
- II. Point Defects and Radiation Damage in Semiconductors
- III. Crystal-Growth and Defects Associated with Various Device Fabrication Processes

ABSTRACTS — Due on July 1, 1980

MANUSCRIPTS — Due on November 15, 1980

Papers to be published by North Holland

Titles (optional) for contributed papers should be sent by *May 11, 1980* to:

| | | |
|-------------------------|----|----------------------------|
| Dr. J. Narayan | or | Dr. T. Y. Tan |
| Solid State Division | | IBM |
| Oak Ridge National Lab. | | Thomas J. Watson Research |
| Oak Ridge, TN 37830 | | Center |
| (615) 574-5508 | | Yorktown Heights, NY 10598 |
| FTS: 624-5508 | | (914) 945-2378 |

SYMPOSIUM C

SEMICONDUCTOR INTERFACES

The purpose of this symposium is to address recent advances in the study of semiconductor interfaces. Subjects related to Metal/Semiconductor, Silicide/Si, Dielectric/Semiconductor and Semiconductor/Semiconductor interfaces will be covered. Attention will be focused on the interface structures and their properties. Experimental investigation of interfaces by XPS, UPS, TEM, Auger, and Backscattering-Channeling will be discussed with emphasis on the interpretation of the observation rather than on the techniques themselves. *Sessions will consist of only invited talks.* A list of invited speakers will be announced later.

A joint session between this symposium and Symposium M on Synthetic Modulated Materials will also be arranged to cover the subject of modulated semiconductor which includes MBE deposition condition, structural characterization super lattice properties and device applications.

Symposium Co-Chairmen:

| | |
|-----------------------------|---------------------------------|
| Dr. W.K. Chu | Dr. J.W. Mayer |
| IBM Data Systems Division | Dept. of Electrical Engineering |
| East Fishkill Facility | California Inst. of Technology |
| Hopewell Junction, NY 12533 | Pasadena, CA 91109 |
| 914/897-8698 | 213/795-6841, Ext. 1817 |

SYMPOSIUM D

SCIENTIFIC BASIS FOR NUCLEAR WASTE MANAGEMENT

The purpose of this symposium is to provide an interdisciplinary forum for discussion of the scientific aspects of nuclear waste management. Invited and contributed papers will be presented on research dealing with all levels and types of radioactive waste and their management. The presentations will emphasize scientific foundations underlying such subject areas as:

- treatment and disposal of non-high level radioactive waste
- waste-near field interaction
- waste form processes and properties
- methodology and standards for waste management
- canister/container — lifetime and compatibility
- backfill barriers
- in situ migration studies
- characterization and modeling of fractured rock
- chemistry of waste elements in the geologic environment
- performance assessment of nuclear waste management
- related topics in geology, e.g., predictive geology, metamictization, natural analogues, etc.

Papers are solicited in these and other appropriate areas. Prospective authors are requested to provide the symposium chairman an original and one copy of a "review summary" on or before July 1, 1980, for peer and editorial review. Selection of those to be presented will be made on the basis of scientific and technical content with preference given to new and unpublished work. The summaries can be up to two pages in length, on 8½ x 11 in. heavy white bond paper, and typed within a block 6½ x 9¾ in. Figures, tables, and/or references may be included. Type the title in CAPS flush with the left margin. Continue on the same line with author(s), affiliation(s), and underline the author to whom all communications should be addressed. Indicate whether an oral (maximum 25 min. including discussion) or poster session is preferable. Authors will be notified of acceptance or rejection of papers by August 1, 1980.

John G. Moore, Program Chairman
Oak Ridge National Laboratory
Bldg. 9204-3
P.O. Box Y
Oak Ridge, TN 37830
(615) 574-0431

SYMPOSIUM E

PHOTO-THERMAL MATERIALS

This one-day symposium will deal with the materials aspects of photo-thermal solar energy conversion. Invited papers will review the research and development efforts involving materials for solar reflector applications (P. Call, SERI), spectrally selective surfaces stable at high temperatures based on chemical vapor deposition (P.D. Allred, Optical Sciences Center, University of Arizona) as well as on composite materials (A.J. Sievers, Physics Department, Cornell University). A fourth invited paper will review problems and progress in black chromium (A. Ignatiev, Physics Department, University of Houston).

Contributed papers in these and related areas of solar-thermal materials are solicited. Abstracts not to exceed 300 words in length should be submitted before July 1, 1980, to the symposium chairman:

B.O. Seraphin
Optical Sciences Center
University of Arizona
Tucson, AZ 85721

SYMPOSIUM F

ELECTRON MICROSCOPE IMAGING AND DIFFRACTION TECHNIQUES IN MATERIALS

A one-day symposium entitled, "Electron Microscope Imaging and Diffraction Techniques in Materials Science" will be held on Monday, November 17, 1980 at the Materials Research Society Meeting in Boston, Massachusetts. The program includes a wide range of topical subjects concerning state-of-the-art in materials characterization and fabrication by electron microscopy. Several distinguished speakers will discuss their most recent advances in the areas of: Scanning Transmission Electron Microscopy, High Voltage Microscopy, Atomic Imaging, Micro Diffraction, Microanalysis, Computerized Image Analysis and Electron Beam Lithography.

Speakers:
Professor John M. Cowley, Arizona State University
STEM Imaging and Microdiffraction in the ASU National Science Foundation Regional Instrumentation Facility
Professor Gareth Thomas, University of California, Berkeley
High Voltage Electron Microscopy and the National Center for Electron Microscopy
Professor Michael Isaacson, Cornell University
Atomic Level STEM Imaging
Dr. Roger Morton, Bausch and Lomb Analytical Systems Division
A Review of Automated Image Analysis Techniques in Electron Microscopy
Dr. R.W. Carpenter, Oak Ridge National Laboratory
Microdiffraction and Microchemical Analysis
Dr. Sumio Iijima, Arizona State University
High Resolution Transmission Electron Microscopy of Lattices and Surfaces

Dr. W.C. Nixon, Cambridge University
The 600kV High Voltage Resolution TEM
Dr. Alec Broers, IBM Corporation
High Resolution Electron Beam Lithography
Dr. William Krakow, IBM Corporation
Diffuse Scattering and Image Calculations of Short Range Order

Program Chairman:
Dr. W. Krakow
IBM Research
T.J. Watson Research Center
Yorktown Heights, N.Y. 10598

SYMPOSIUM G

SPECTROSCOPIC CHARACTERIZATION OF HETEROGENEOUS CATALYSTS

Catalysts and adsorbed species can be characterized by a variety of spectroscopic techniques. *In situ* studies are particularly attractive in developing an understanding of functioning catalysts. In this symposium, spectroscopic methods which are well-suited for studying surfaces — such as laser Raman, Fourier transform-infrared, and dispersive spectroscopies — will be reviewed. New developments in instrumentation and advances in applications will be discussed.

Invited Speakers
Dr. Jeanette Grasselli
The Standard Oil Co. (Ohio)

Dr. Richard Van Dyne
Northwestern University

Dr. Charles Angell
Union Carbide

Other Speakers
Dr. Charles G. Hill
University of Wisconsin — Madison

Dr. Richard Kellerman
Xerox Corporation

A one page abstract should be sent before July 1, 1980 to Professor Glenn L. Schrader, Center for Catalytic Science and Technology, Department of Chemical Engineering, University of Delaware, Newark, Delaware 19711.

SYMPOSIUM H

CATALYST SUPPORTS AND SUPPORT EFFECTS

This symposium will be concerned with the role of the support in catalysis. The symposium will be composed of both invited and submitted papers covering original research.

Invited Speakers

1. C. H. Bartholomew, Brigham Young University
"Crystallite Size and Support Effects in CO Hydrogenation"
2. J. A. Dumesic, University of Wisconsin
"Iron Support Interactions Studied by Mössbauer Spectroscopy"
3. G. L. Haller, Yale University
"Rhodium-Support Interactions"
4. B. R. Powell, Jr., General Motors Research Laboratories
"Stabilization of High Surface Area Aluminas"
5. W. L. Worrell, University of Pennsylvania
"Thermodynamics and Kinetics of Noble Metal-Oxide Support Interactions"

The symposium organizers welcome papers on such topics as: properties of support materials, stabilization of supports, modification of support structures, support-metal interactions, support effects on dispersion, and characterization of catalysts on non-standard supports. People desiring to submit papers are requested to submit abstracts (see Abstracts Information on p. 11) to one of the chairmen.

Co-Chairmen:

| | |
|--|--|
| D. R. Monroe (313-575-2474) General Motors Research Laboratories Physical Chemistry Department Warren, Michigan 48090 | S. J. Tauster (201-474-3157) Exxon Research and Engineering P. O. Box 405 Linden, New Jersey 07036 |
|--|--|

SYMPOSIUM I

HYDROGEN AT SURFACES AND INTERFACES

Hydrogen plays a special role in the determination and modification of the structure and electronic properties of solid surfaces. The complex nature of the interaction has been demonstrated in a variety of studies of the vacuum-solid interface under UHV conditions. The provocative results have stimulated new theoretical insights into the hydrogen-surface interaction. Concurrently the understanding of the role of hydrogen at internal surfaces, such as solid-solid interfaces and grain boundaries, has received much attention due to the fundamental nature of the problem and its importance in energy related research and semiconductor applications. The objective of this symposium is to present the new advances in the interaction of hydrogen with solid surfaces and to explore their inter-relationship.

The three-day symposium will highlight the major areas listed below:

1. Quantitative Analysis of Hydrogen
2. Interaction of Hydrogen with Clean Surfaces
3. Catalysis
4. First Wall Problems
5. Semiconductors: Interfaces and Grain Boundaries
6. Metals: Corrosion and Embrittlement

Invited Speakers Include:

- P. Estrup, Brown University — Hydrogen Induced Surface Reconstructions
R. Hamann, Bell Laboratories — Theory of Hydrogen-Surface Interactions
Dr. C. McGee, R.C.A. — Hydrogen Analysis by SIMS
W. Lanford, SUNY Albany — Nuclear Techniques for Analysis
G. Fisher, G.M. — Catalysis

The symposium chairmen welcome contributions. Further information can be obtained from, and contributions should be sent to (May 15 deadline):

- L. C. Feldman
Room 1E-434
Bell Laboratories
600 Mountain Avenue
Murray Hill, New Jersey 07974
(201) 582-5470
- M. L. Knotek
Sandia Laboratories
Albuquerque, New Mexico 87185
(505) 844-2272

SYMPOSIUM J

NUCLEAR AND ELECTRON RESONANCE SPECTROSCOPIES APPLIED TO MATERIALS SCIENCE

In what areas are the resonance spectroscopies now complementing the interdisciplinary attack on modern material properties and processes? This symposium brings together those currently engaged in resonance studies on materials, in the broader context of the Materials Research Society annual meeting, to discuss this question. Invited speakers will give recent examples of the diagnostic power of these methods on materials ranging from metallic glasses to semiconductors to coal. Contributed papers will add to the covered range of materials and variations of technique. All those interested in the utilization of the nuclear and electron resonance methods or in the materials questions which they address are invited to attend.

Invited Speakers

- D. C. Ailion (Utah) — Superionic Conductors
R. G. Barnes (Iowa) — Hydrides
L. H. Bennett (NBS) — Alloys
K. L. Brower (Sandia) — Defects in Silicon
C. L. Chien (Johns Hopkins) — Metallic Glass
F. Y. Fradin (Argonne) — Superconductors
D. L. Griscom (NRL) — Amorphous Insulators
T. A. Kennedy (NRL) — III-V Semiconductors
G. Longworth (Harwell) — Ion Implanted Alloys
P. A. Montano (W. Virginia) — Coal
E. Recknagel (Konstanz) — Defects in Metals
D. Richter (Jülich) — Muons/Diffusion & Trapping
B. G. Silbernagel (Exxon) — Catalysts
H. de Waard (Groningen) — He Trapping in Metals

Contributions are solicited which report original research in materials science utilizing, at least in part, nuclear resonance (NMR, NQR . . .), Mossbauer effect, electron resonance (ESR, EPR, ENDOR, . . .), spin precession (TDPAC, μ SR . . .), or other methods which rely on the interaction of nuclear or electronic moments with their environment. Appropriate materials and properties include, but are not limited to, amorphous alloys (metallic glass), defects in semiconductors or metals, layered compounds (battery materials), coal, catalysts, superconductors, superionic conductors (fast ion transport), hydrides and hydrogen (or other gases) in metals, amorphous insulators (glasses), interfaces, ion implanted systems, radiation damage, laser or e-beam treated systems, precipitation phenomena, etc. The deadline for abstract submission is June 1, 1980. Instructions for the preparation of abstracts and future announcements will be sent to those who respond with proposed title and author information to E. N. Kaufmann, Bell Laboratories, 1E-445, Murray Hill, NJ 07974. Questions may be addressed to one of the co-chairmen below:

- E. N. Kaufmann
Room 1E-445
Bell Laboratories
600 Mountain Avenue
Murray Hill, NJ 07974, U.S.A.
(201) 582-4428
- G. K. Shenoy
223-A233
Argonne National Laboratory
9700 South Cass Avenue
Argonne, IL 60439 U.S.A.
(312) 972-5491

SYMPOSIUM K

MAGNETIC AND OPTICAL MATERIALS FOR INFORMATION STORAGE

This symposium will focus on recent developments in particulate and continuous media for magnetic information storage and new materials and structures for optical data storage. Emphasis will be on the preparation, stabilization and structures of the materials and their respective magnetic or optical properties. Several invited papers will keynote each session, followed by contributed papers detailing recent work. Magnetic materials will include metal particles, oxides, and intermetallic alloys; optical materials will scope organics, inorganics, and composites including materials for optical disc, video, and holographic storage.

Persons wishing to contribute a paper or those desiring further information should contact Dr. Theodore Davidson, Xerox Webster Research Center, Building 114, 800 Phillips Road, Webster, New York 14580, phone (716) 422-3032 or 422-3408.

SYMPOSIUM L

ADVANCES IN CEMENT-MATRIX COMPOSITES

H.
Dr. Y

Topics at this symposium, scheduled for November 17 and 18, include recent advances in the materials science of glass, metal, and other fiber composites, coating of fibers and the mechanical properties and fracture of fiber-reinforced cement and gypsum composites. The role of polymers in cement matrix and concrete strengthening will be included, together with papers on the chemical interactions between fiber and matrix, and chemical and mechanical factors affecting cohesion. There will be invited and contributed papers.

Symposium Program Committee: D.M. Roy, A.J. Majumdar, S.P. Shah and J.A. Manson. Send 200-word (maximum) abstracts before July 1, 1980 (maximum 12-page manuscripts or two-page extended abstract [camera-ready] due before or at the time of the meeting) to the Chairperson: D.M. Roy, Materials Research Laboratory, The Pennsylvania State University, University Park, PA 16802 (USA).

SYMPOSIUM M

SYNTHETIC MODULATED MATERIALS

Session A — Semiconductors
Session B — Metals
Session C — General Session

This symposium will provide an interdisciplinary forum for discussions of different aspects of synthetic structures with compositional and, in the case of semiconductors, doping modulations.

Topics on semiconductors include deposition conditions and characteristics, surface and structural studies, physical and electronic properties, and device applications; related topics in heterojunctions and molecular beam epitaxy will also be covered. Topics on compositionally modulated metals include their preparation and the study of their mechanical and electronic properties, especially magnetism and superconductivity and the use of such materials as model systems for dimensional effects. The session on modulated semiconductors will be a part of this symposium as well as Symposium C (Semiconductor Interfaces).

Both invited and contributed papers will be presented. A partial list of invited speakers includes:

T.R. Barbee, Stanford University, Synthesis and Structure of Layered Synthetic Microstructures;
M.R. Beasley, Stanford University, Properties of Superconducting Layered Composites;
C.A. Chang, IBM Research Center, Growth and Properties of Periodically Modulated Semiconductor Structures — Superlattices;
A.C. Gossard, Bell Laboratories, Doping Modulation of Semiconductor Structures;
J.E. Hilliard, Northwestern University, Mechanical, Magnetic and Superconducting Properties of Some Artificial Modulated Metals;

N. Holonyak, Jr., University of Illinois, Quantum-Well Heterojunction Lasers;

A. Madhukar, University of Southern California, Electronic Structure and Properties of Modulated Semiconductor Structures.

For further information or for mailing abstracts of contributors, please contact one of the Co-chairmen, L. L. Chang, IBM, T. J. Watson Research Center, Yorktown Heights, N.Y. 10598, (914) 945-2254, B.C. Giessen, Northeastern University, Boston, MA 02115, (617) 437-2827, F. Spaepen, Harvard University, Cambridge, MA 02138, (617) 495-3760.

ABSTRACTS INFORMATION¹

INSTRUCTIONS FOR PREPARING ABSTRACTS FOR THE MATERIALS RESEARCH SOCIETY ANNUAL MEETING*. Ernest M. Hawk and B. Kay, Materials Research Society Secretariat, 102C Materials Research Laboratory, University Park, PA 16802.

Follow this example in typing the abstract. Reproduction will be done by photographing the abstract copy *exactly* as received in this format. Be sure to confine typed copy to an area 7'' (17.78 cm) wide x 7 $\frac{1}{2}$ '' (19.37 cm) long.

There are no special forms distributed for typing abstracts. You may find it helpful to trace a block 7'' x 7 $\frac{1}{2}$ '' in nonreproducible blue pencil, or in dark lines on a backing sheet. Please follow these guidelines:

- (1) Use 8 $\frac{1}{2}$ '' x 11'' heavy white bonded paper.
- (2) Use electric typewriter, preferably IBM Selectric Letter Gothic typeface and carbon ribbon.
- (3) Indenting the first two lines five spaces from the left margin, type title in capital letters, single-spaced. Continue on same line with author(s), affiliation(s), and address(es) in capitals and lower case, underlining the author who will present the paper and be the addressee for all communications.
- (4) Begin text two lines below last line of title/author(s) section. Single space, with double spacing between paragraphs.
- (5) Use standard Greek symbols.
- (6) Figures, tables and/or references may be included. References should be treated in the same manner as paragraphs, set off by numbers in parentheses.

The deadline for submission of abstracts in this format will be communicated to authors by symposia chairpersons. Please cooperate by observing the deadline and these instructions. Thank you.

¹Applies to all Symposia except Symposium D — see p. 4.

*Adopted by the MRS Cabinet and 1980 Meeting Program Committee, January 16, 1980.

MATERIALS RESEARCH SOCIETY ANNUAL MEETING AWARDS FOR GRADUATE STUDENTS

Fr.
Dr. Y

The Materials Research Society announces the availability of ten awards for graduate students conducting research on a topic to be addressed in the several symposia planned for the 1980 annual meeting. Each award will consist of a cash grant of \$50, to be presented at the Von Hippel Award ceremony during the meeting, a waiver of the registration fee, and a travel grant, amounting to one-half the price of economy round-trip air fare from the student's community to Boston, MA, the site of the 1980 meeting.

Criteria for selection are:

1. Graduate standing in a recognized academic program in either materials science, metallurgy, ceramics, or polymers; physics or chemistry; geology or mineral science; electrical, civil, mechanical, mining or nuclear engineering; or other materials-related field.
2. Participation in a research project dealing with one of the following symposium topics:
 - a. Laser-Solid Interaction
 - b. Defects in Semiconductor
 - c. Semiconductor Interfaces
 - d. Nuclear Waste Management
 - e. Photo-Thermal Materials
 - f. Electron Microscopic Imaging
 - g. Spectroscopic Characterization of Heterogeneous Catalysts
 - h. Catalyst Supports and Support Effects
 - i. Hydrogen at Surfaces and Interfaces
 - j. Nuclear and Electron Resonance Spectroscopies Applied to Materials Science
 - k. Magnetic and Optical Materials for Information Storage
 - l. Advances in Cement-Matrix Composites
 - m. Synthetic Modulated Materials
3. Outstanding performance in the conduct of this project and promise for future substantial achievement in materials research as judged by the faculty advisor.

Othe
D

Significant and timely research results, as judged by the chairman of the appropriate symposium.

Application materials required are:

1. Application form, obtained by writing to:
Secretariat
Materials Research Society
102C Materials Research Laboratory
University Park, PA 16802
2. Abstract of relevant thesis or publication.
3. Letter of support from research supervisor, to be sent to above address.

Deadline for completed applications is September 1, 1980. Results will be announced on October 1.

MATERIALS RESEARCH SOCIETY

INFORMATION REQUEST FORM

Name _____

Organization _____

Address _____

Position _____

Please place my name on your mailing list to receive additional information about the annual meeting and the Materials Research Society.

Return to: M.R.S. Secretariat
102C Materials Research Laboratory
University Park, PA 16802