

PROCEEDINGS ORDERS

1985 FALL MEETING

Symposia A, B, C, E, G, H, I, J, K, L, P, Q, R, S, T, and Y plan to publish proceedings, which will be available after the meeting. In addition, Symposia D, N, and O will publish extended abstracts booklets, which will be available at the meeting. To receive copies of proceedings volumes or extended abstracts booklets, fill out the form below and enter total price both here and on the other side.

Please note: These prices apply only to meeting registrants and MRS members. Nonmembers should contact MRS headquarters for prices and ordering information.

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MRSB

**PREREGISTRATION FORM
 1985 MRS SHORT COURSES
 Friday - Saturday, December 6-7, 1985**

I wish to register for (please check):

- One-Day Courses (Tuition: \$275 each)***
1. _____ Ion Implantation and Rapid Thermal Annealing Friday
 2. _____ Deep Level Transient Spectroscopy Friday
 3. _____ Sol-Gel Processing of Glass Friday
 4. _____ Application of Reflection Electron Diffraction to Epitaxial Growth Friday
 5. _____ Ion Beam Modification of Non-Semiconductors Saturday

NOTE: Participants may attend a one-day course on Friday and the one-day course on Saturday at the rate for a two-day course.

- Two-Day Courses (Tuition: \$435 each)***
6. _____ Surface and Thin Film Analysis Friday and Saturday
 7. _____ Liquid Phase Epitaxy Techniques Friday and Saturday
 8. _____ Vapor Phase Epitaxy Friday and Saturday
 9. _____ Molecular Beam Epitaxy Friday and Saturday
 10. _____ Vacuum Technology Friday and Saturday
 11. _____ Materials Aspects of Silicon Devices Friday and Saturday
 12. _____ Electronic Properties of Amorphous Semiconductors Friday and Saturday
 13. _____ Processing-Microstructure-Mechanical Property Relationships in Metals Friday and Saturday
 14. _____ Films and Coatings for Engineering Applications Friday and Saturday

*DEADLINE FOR PREREGISTRATION: November 1, 1985
 Later registrations and at-meeting registrations:
 \$300 for one-day courses; \$460 for two-day courses.

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Make check (on U.S. bank only) payable to the MATERIALS RESEARCH SOCIETY and send with this form to:
 Materials Research Society Headquarters, Short Course Registration,
 9800 McKnight Road, Suite 327, Pittsburgh, PA 15237, U.S.A.

CANCELLATION POLICY: Short course registration cancellations received before November 22 will be refunded less a service charge of \$10. No refunds will be made for cancellations received after November 22 or to persons who do not attend but fail to notify the Society.

The Materials Research Society reserves the right to cancel a short course if factors beyond our control make it impractical. In such an event, registrants will be notified as quickly as possible and full refund of tuition will be made.

MRSB

REGISTER EARLY

- Short Course
Preregistration
- Meeting
Preregistration
- Hotel Reservations

*Preregistration
Deadline:
November 1, 1985*

RESEARCH INTERESTS

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Please complete this card and return with check* or money order payable to Materials Research Society to:

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9800 McKnight Road, Suite 327
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will span polymer-polymer interdiffusion, diffusion in polymers, polymeric metals and semiconductors, energy/excitation transport in polymers, photoeffects in polymers, polymers in micro-imaging, ion beam effects in polymers, radiation effects in polymers, field-induced effects in polymers. Invited speaker include: J. Klein, P. G. deGennes, H. Yu, S. F. Edwards, B. Christ, M. Tirrell, B. A. Smith, E. D. von Meerwall, H. B. Hopfenberg, A. G. MacDiarmid, T. J. Marks, G. L. Baker, M. A. Ratner, A. J. Heeger, R. L. Elsenbaumer, M. Kertesz, G. Harbeke, H. A. Pohl, L. W. Shacklette, T. A. Skotheim, J. B. Lando, H. Sasabe, Curtis W. Frank, Stephen E. Webber, S. Etemad, P. M. Borsenberger, R. Svinivasan, Gary N. Taylor, G. Willson, G. Foti, R. S. Potember, S. Tripathy, J. I. Scheinbeim.

Biomedical Materials (Symposium G)

December 3-6 (Tuesday-Friday)

Chairs: M. F. Nichols, University of Missouri; J. M. Williams, Oak Ridge National Laboratory; W. Zingg, University of Toronto

Approximately 55 papers and panel discussions will explore cardiovascular materials, ophthalmic biomaterials, reconstruction materials for bone and teeth, materials for orthopaedics, biomaterials for electrodes, novel materials and techniques, materials problems in simulation and practice, science and technology of biomaterials. Invited speakers include: Allan S. Hoffman, H. K. Yasuda, J. Michael Lee, Eugene P. Goldberg, Larry L. Hench, D. F. Williams, J. E. Lemons, John T. Scales, F. T. Hambrecht, D. F. Gibbons.

Layered Structures and Epitaxy (Symposium H)

December 2-6 (Tuesday-Friday)

Chairs: J. M. Gibson, AT&T Bell Laboratories; G. C. Osbourn, Sandia National Laboratories; R. M. Tromp, IBM Research Center

Approximately 87 oral and poster papers will examine epitaxial semiconductor films, surfaces and ultrathin films, epitaxial silicides, quantum wells, strained layer superlattices, Ge/Si and non-crystalline superlattices, metal superlattices. Invited speakers include: R. C. Pond, K. Takayanagi, E. J. van Loenen, G. A. Prinz, R. T. Tung, P. S. Ho, L. L. Chang, P. Petroff, F. Capasso, J. N. Schulman, L. Dawson, T. Picraux, E. Kasper, E. Spiller, T. Tsakalakos.

Phase Transitions in Condensed Systems—Experiments and Theory (Symposium I)

A Symposium in Honor of Professor David Turnbull

December 5-6 (Thursday-Friday)

Chairs: G. S. Cargill III, IBM Corporation; F. Spaepen, Harvard University, K. N. Tu, IBM Research

Approximately 37 papers will explore nucleation, liquids, glasses, and glass formation; diffusion and defects; crystal growth and solid state transitions. Invited speakers include: John W. Cahn, F. Spaepen, D. Lazarus, M. E. Glicksman.

Rapidly Solidified Alloys and Their Mechanical and Magnetic Properties (Symposium J)

December 2-4 (Monday-Wednesday)

Chairs: B. C. Giessen, Barnett Institute; D. E. Polk, Office of Naval Research; A. I. Taub, G. E. Corporate Research and Development

Approximately 73 oral and poster presentations will address fundamentals and processing; structure and properties of amorphous, quasicrystalline and metastable crystalline alloys; rapidly solidified alloys and their mechanical properties; magnetic properties of rapidly solidified alloys. Invited speakers include: B. L. Mordike, W. L. Johnson, R. Hasegawa, R. J. Schaefer, F. H. Froes, J. R. Pickens, A. I. Taub, H. Jones, R. C. O'Handley, G. C. Hadipanayis.

Oxygen, Carbon, Hydrogen, and Nitrogen in Crystalline Silicon (Symposium K)

December 2-5 (Monday-Thursday)

Chairs: J. W. Corbett, SUNY at Albany; J. C. Mikkelsen, Jr., Xerox Corporation; S. J. Pearton, AT&T Bell Laboratories; S. J.

Pennycook, Oak Ridge National Laboratory

Approximately 63 oral and poster presentations will address oxygen precipitation thermal donors, bulk oxygen behavior and related defects, carbon in silicon, hydrogen in silicon, nitrogen in silicon. Invited speakers include: A. Bourret, T. Y. Tan, S. M. Hu, L. C. Kimerling, M. Stavola, J. M. Spaeth, P. Wagner, L. C. Snyder, J. C. Mikkelsen, Jr., J. L. Lindstrom, A. Ourmazd, K. Sumino, R. C. Newman, U. Gosele, S. J. Pearton, T. Abe, H. J. Stein, R. J. Jaccodine.

Defect Properties and Processing of High-Technology Nonmetallic Materials (Symposium L)

December 2-4 (Monday-Wednesday)

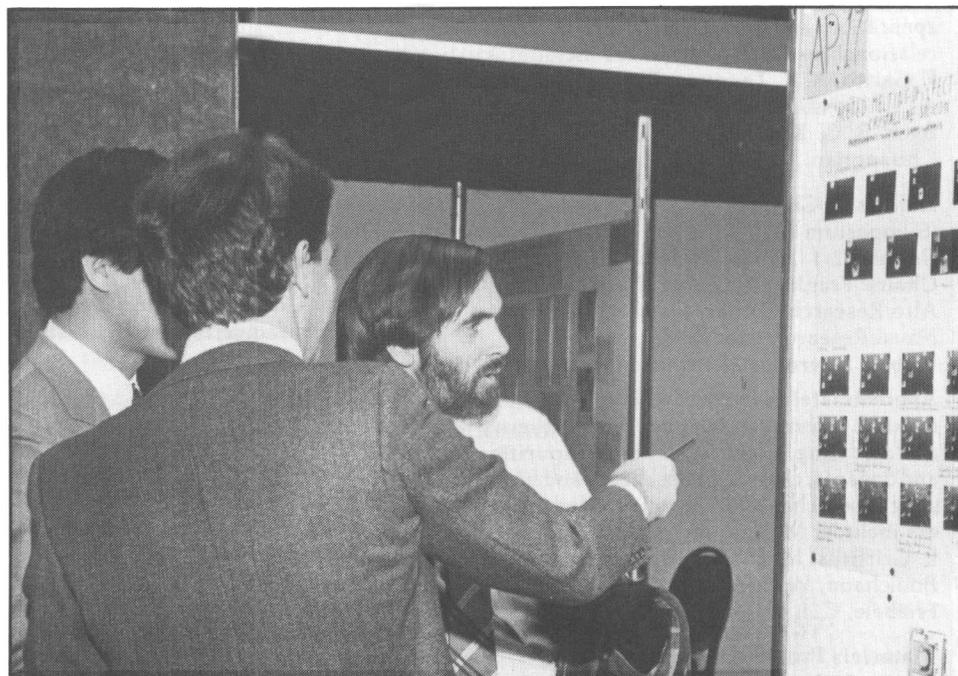
Chairs: Y. Chen, Oak Ridge National Laboratory; W. D. Kingery, Massachusetts Institute of Technology; R. J. Stokes, Honeywell, Inc.

Approximately 74 oral and poster papers will discuss advanced processing; lattice defects, interfaces and surfaces; surface modification; microwave processing; optical materials; mechanical properties. Invited speakers include: J. B. Wachtman, H. K. Bowen, A. G. Evans, J. H. Harding, C. B. Carter, J. Narayan, Wayne R. Tinga, Rustum Roy, M. P. Harmer, Richard C. Powell, R. Holman, Tadashi Miyashita, A. H. Heuer, F. F. Lange.

Oxides, Zeolites and Clays in Catalysis (Symposium M)

December 2-4 (Monday-Wednesday)

Chairs: D. E. W. Vaughan, Exxon



Poster sessions will be open Tuesday through Thursday for registrants to browse and hold informal discussions with colleagues.

Research and Engineering; A. W. Sleight, E. I. du Pont de Nemours

Approximately 33 papers will investigate catalyst characterization and synthesis of oxides and hydroxides, synthesis and characterization of clays and pillared clays, clay and pillared clay catalysts, zeolite synthesis and characterization, zeolite structural and catalytic characterization. Invited speakers include: John M. Thomas, F. S. Stone, Ji-Xiang Wang, A. Schutz, R. A. van Santen, G. T. Kerr, D. Barthomeuf.

Fractal Aspects of Materials (Symposium N)

December 2-4 (Monday-Wednesday)

Chairs: R. B. Laibowitz, IBM Research Center; B. B. Mandelbrot, Harvard University; D. E. Passoja, Passoja Inc.

Approximately 38 papers and panel discussions will span various topics dealing with the characterization and application of fractals. Invited speakers include: R. F. Voss, D. W. Schaefer, H. J. Wiesmann, J. Klafter, P. W. Schmidt, B. Sapoval, Y. Termonia, D. A. Weitz, K. Kubik, B. B. Mandelbrot, P. G. deGennes, R. L. Orbach, A. P. Thomas, M. Maurette, R. Kopelman, Y. Gefen, L. M. Sander, R. Messier.

Nonlinear Optical Materials (Symposium O)

December 4-6 (Wednesday-Friday)

Chairs: A. M. Glass, AT&T Bell Laboratories; D. A. B. Miller, AT&T Bell Laboratories; C. L. Tang, Cornell University

Approximately 43 papers will discuss polymers, photorefractive materials, semiconductors and microstructures, organics, applications and growth, structure-property relationships. Invited speakers include: A. F. Garito, A. R. Tanguay, R. W. Hellwarth, A. C. Gossard, D. Ricard, J. Zyss, R. L. Byer, B. G. Kushner, W. C. Egbert, Chen Chuangtian.

Defects in Glasses (Symposium P)

December 2-4 (Monday-Wednesday)

Chairs: Frank L. Galeener, Xerox Palo Alto Research Center; David L. Griscom, Naval Research Laboratory; Marvin J. Weber, Lawrence Livermore Laboratory

Approximately 44 papers will explore silicon dioxide, intermediate range order, theory and modeling, short range order, impurities and dopants, chalcogenides, fibers and films, gel glasses, characterization. Invited speakers include: M. Kastner, A. H. Edwards, J. E. Griffiths, M. F. Thorpe, S. A. Brawer, P. Boolchand, W. B. Sibley, P. C. Taylor, E. J. Friebele, C. J. Brinker.

Materials Problem Solving with the Transmission Electron Microscope (Symposium Q)

December 2-4 (Monday-Wednesday)

Chairs: L. W. Hobbs, Massachusetts Institute of Technology; K. H. Westmacott, Lawrence Berkeley Laboratory; D. B. Williams, Lehigh University

Approximately 59 papers will examine electron microscopy of electronic materials, analytical electron microscopy, precipitate and phase analysis, transformations and amorphization, catalysts and ceramics. Invited speakers include: Janet M. Brown, T. Sands, Fernando A. Ponce, P. S. Sklad, A. J. Garrett-Reed, M. Disko, J. A. Eades, J. C. H. Spence, A. D. Romig, M. Raghavan, U. Dahmen, W. Kesternich, J. R. Michael, A. R. Pelton, M. M. J. Treacy, C. E. Layman.

Computer-Based Microscopic Description of the Structure and Properties of Materials (Symposium R)

December 4-6 (Wednesday-Friday)

Chairs: J. Broughton, SUNY-Stony Brook; W. Krakow, IBM T. J. Watson Research Center; S. T. Pantelides, IBM T. J. Watson Research Center

Approximately 46 papers will discuss applications in metals, electronic materials, alloys, glasses, and polymers, and theoretical studies. Invited speakers include: B. Berne, A. J. Freeman, W. A. Goddard III, R. Car, D. L. Mills, J. Doll, W. Krakow, J. Hafner, A. Angell, M. L. Cohen, O. K. Anderson, W. Hoover, V. Vitek, K. C. Pandey, L. Bakker, J. Eberhardt, K. A. Jackson, J. Haile, P. B. Allen, U. Landman.

Cement-Based Composites: Strain Rate Effects on Fracture (Symposium S)

December 4-5 (Wednesday-Thursday)

Chairs: S. Mindess, University of British Columbia; S. P. Shah, Northwestern University

Approximately 24 papers will explore strain-rate effects, cracking and strength at varying strain rates, dynamic effects. Invited speakers include: F. H. Wittmann, S. P. Shah, H. W. Reinhardt, L. E. Malvern.

Fly Ash and Coal Conversion By-Products: Characterization, Utilization and Disposal II (Symposium T)

December 2-4 (Monday-Wednesday)

Chairs: G. J. McCarthy, North Dakota State University; D. M. Roy, Pennsylvania State University

Approximately 45 papers will span utilization, characterization and reactions, fly ash standards and data centers, modeling of properties, environmental considerations, characterization and utilization. Invited speakers include: G. M. Idorn, M. A. Mearing, R. B. Finkelman, R. C. Joshi, I. P. Murarka, T. Anthony.

Frontiers in Materials Research

(Symposium X)

December 2-5 (Monday-Thursday)

Chair: Rustum Roy, Pennsylvania State University

Five sessions of "Tutorial Reviews for the Non-Specialist" will cover aspects of clays and zeolites, amorphous metals, thin films, semiconductors, ceramic composites, semiconducting and metallic polymers, materials for lasers. Speakers include: J. M. Thomas, Don E. Polk, C. A. Evans, J. Narayan, M. S. Newkirk, M. K. Aghajanian, R. W. Cahn, R. F. Messier, Alan Heeger, A. Mooradian.

Frontiers in Materials Education (Symposium Y)

December 3-4 (Tuesday-Wednesday)

Chairs: G. L. Liedl, Purdue University; L. W. Hobbs, Massachusetts Institute of Technology

Approximately 23 papers will discuss materials education—philosophy and future, industry-government interactions, ceramics, polymers, and problem areas, cross-discipline education. Invited speakers include: M. Cohen, I. M. Bernstein, M. C. Flemings, R. Roy, J. J. Harwood, P. Chaudhari, S. Hecker, E. L. Thomas, D. W. Ready, H. Marcus.

FALL MEETING TIMETABLE

REGISTRATION HOURS:

(Fourth Floor)

Sunday: 4:00 p.m.-7:00 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 in Preliminary and Final Programs)

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:

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

14 SHORT COURSES

On

ADVANCED MATERIALS RESEARCH TECHNIQUES

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

Make plans now to round out your week in Boston at the MRS Fall Meeting by attending an MRS short course. Look for details and registration information in the mail and register early.

Friday, December 6, (One-Day Courses)

Ion Implantation and Rapid Thermal Annealing

Instructor: T. E. Seidel, J. C. Schumaker Co.

Deep Level Transient Spectroscopy

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.

**Materials Research Society, 9800 McKnight Road, Suite 327, Pittsburgh, PA 15237;
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MRS CORPORATE PARTICIPATION

An investment in excellence of advanced materials technology

Nearly 100 organizations worldwide support the educational activities of the Materials Research Society by participating as Corporate Affiliates. The financial contributions and technical advice provided by Corporate Affiliates enables the Society to focus symposia, publications, and short courses toward a more thorough understanding of recent progress for the entire scientific community.

Corporate Affiliates will also enjoy the following benefits in 1986:

- One subscription each of **MRS Bulletin** and *Journals of Materials Research*.
- Advance consultation on topical program content and opportunity to meet with Society officers on topics of mutual concern.
- Free listing of employment opportunities in **MRS Bulletin**.
- Reduced rates on MRS symposia proceedings.
- ... and more.

For further information on the program, contact William Katz, General Electric/KAPL, P.O. Box 1072, Bldg., E1, Room 114C, Schenectady, NY 12301; telephone (518) 393-6611, ext. 7051.

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ARCO Solar, Inc.	Hirst Research Centre	Sandia National Laboratories
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Combustion Engineering, Inc.—Power Systems	Lambda Physik	Tamarack Scientific Co.
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Engelhard Corporation	Materials Research Corporation	Westinghouse Electric Corporation
Charles Evans & Associates	Microscience, Inc.	Xerox Corporation
Exxon Research and Engineering Company	Monsanto	XMR
Ferranti, plc	National Electrostatics Corporation	Zymet
GCA Corporation		

New and Recent Titles in Materials Science

Alumina: Processing, Properties and Applications E. Dörre and H. Hübner

Provides the first comprehensive presentation of alumina as a technical material, including details of production and processing methods. It describes the material behavior and underlying mechanisms from a materials science perspective and serves as a valuable reference to the physical and mechanical properties for researchers and manufacturers. In addition to a summary of current research, the book contains numerous examples of alumina applications in mechanical and electrical engineering, electronics, and medicine, as well as ideas and technical solutions for the creation of new products.

1984/329 pp./178 illus./hardcover \$36.00
ISBN 0-387-13576-6

Materials Science and Engineering

New — Electronic Properties of Materials: An Introduction for Engineers R.E. Hummel

Written specifically for materials and electrical engineers, this book covers the electrical, optical, magnetic, and thermal properties of materials and their applications. It stresses physical concepts rather than mathematical formalism to deliver a fundamental understanding of semiconductors, magnetic materials, lasers, ceramics, and alloys. Plenty of practical applications, illustrations, and problems aid readers in gaining a realistic foundation in the electronic properties of materials.

1985/320 pp./228 illus./hardcover \$34.50
ISBN 0-387-15631-3

Ultrasonic Testing of Materials *Third Edition* J. Krautkrämer and H. Krautkrämer

Translated from the Third German Edition by B.W. Zenzinger
This classic in the field describes not only the fundamentals of the most important methods for nondestructive testing of materials, but also focuses on special problems in practical applications, the interpretation of response signals, and instrumentation.

1983/667 pp./509 illus./hardcover \$85.00
ISBN 0-387-11733-4

Electronic Properties of Doped Semiconductors B.I. Shklovskii and A.L. Efros

Translated from the Russian by S. Luryi

Covers those phenomena on doped semiconductors that depend essentially on the disorder caused by randomly distributed space donors and acceptors, e.g., Anderson localization, hopping conduction, metal non-metal transition due to compensation of impurities or due to an increase of the doping level, and optical phenomena related to the tails of the density of states.

1984/388 pp./106 illus./hardcover \$49.00
ISBN 0-387-12995-2

Springer Series in Solid-State Sciences, Vol. 45

Adhesives in Engineering Design W.A. Lees

This practical manual reflects extensive industrial experience in the use of adhesives for the assembly of mechanisms and structures and considers 'shop-floor' realities of manufacturing and use. Particular attention is paid to the nature, uses, and function of adhesives and the problems of selecting the most appropriate adhesive for a specific application. A special section leads readers through the steps of the selection process — this section is also available in corresponding EASEL software for popular microcomputers.

1984/147 pp./46 illus./hardcover \$28.00
ISBN 0-387-15024-2

Published jointly with the Design Council, London, U.K.

New — The Structure of Surfaces M.A. Van Hove and S.Y. Tong

This book collects selected papers from the *First International Conference on the Structure of Surfaces*. The papers assess the status of surface structural determination and the relationship between surface or interface structures and physical or chemical properties. This includes solid and adsorbate-covered surfaces, well-established and new surface-sensitive techniques, experiments, and theory.

1985/435 pp./223 illus./hardcover \$49.00
ISBN 0-387-15410-8

Springer Series in Surface Sciences, Vol. 2

Landolt-Börnstein New Series Numerical Data and Functional Relationships in Science and Technology Editors in Chief: K.-H. Hellwege and O. Madelung

The New Series offers specialized, up-to-date, and reliable data in six classes of physical data: *I. Nuclear and particle physics, II. Atomic and molecular physics, III. Crystal and solid state physics, IV. Macroscopic and technical properties of matter, V. Geophysics and space research, VI. Astronomy, astrophysics, and space research.* Comprehensive indices for the New Series and the Sixth Edition are in preparation.

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