

## GM Scientists Make Magnequench Even Stronger

General Motors Research scientists have discovered how to further increase the strength of Magnequench magnets. The new magnets are stronger than any other commercially made permanent magnets and are based on relatively abundant and inexpensive materials.

Magnequench magnets, a new family of permanent magnets based on iron, neodymium, and boron, were first introduced by GM in November 1983. They are made by rapidly solidifying a molten stream of alloy on the surface of a rotating quench wheel. This results in delicate ribbons of fine crystalline alloy. When magnetized, these ribbons are about three times as strong as ferrite magnets.

The new method involves the carefully controlled application of heat and pressure to Magnequench ribbons. Pressure is applied in a die which allows the heat-softened ribbon to flow in a direction transverse to the pressing direction, producing magnets ten times as strong as ferrite magnets. The processing parameters can also be controlled to achieve a range of lower energy products to meet an almost unlimited spectrum of engineering applications. GM researchers say this hot-working method promises to reduce costs, simplify manufacture, and assure higher quality than any other known method for manufacturing neodymium-iron-boron based magnets.

The first commercial application of Magnequench will be a cranking motor made by GM's Delco Remy Division. The motor magnets will be made by mixing Magnequench ribbons with an epoxy binder and compacting them in a press at room temperature.

## Brimrose Corp. Develops Magnetically Tunable Infrared Detector

Brimrose Corporation of America has been awarded \$300,000 from the U.S. Space & Naval Warfare Systems Command for developing the first magnetically tunable frequency far infrared sensor using mercury manganese telluride (MMT). Applying a magnetic field to MMT can significantly change the bandgap of this material. Using a sophisticated color x-ray nondescriptive topographic technique developed at Brimrose, it is now possible to quantitatively evaluate the defect structure in materials before fabrication. These unique sensors have potential use in Strategic Defense Initiative (SDI) applications in land and satellite-based systems.

Brimrose also announced the opening of a

Customs Crystal Optics Division, offering a wide range of custom-made optics from plano to various types of lenses, prisms, and mirrors fabricated from conventional and exotic materials, including all irtran materials such as zinc, selenide, and germanium.

For more information contact Brimrose Corporation of America, 7720 Belair Road, Baltimore, MD 21236; telephone (301) 668-5800.

## Griscom and Pohanka Named Fellows of American Ceramic Society

David L. Griscom and Robert C. Pohanka were named Fellows of the American Ceramic Society during ceremonies conducted early in May during the Annual Meeting of ACerS.

Dr. Griscom is a research physicist in the Optical Sciences Division of the U.S. Naval Research Lab, Washington, DC. He is a member of the ACerS Glass Division, and he served as chairman of its George W. Morey Award Committee in 1982. He received the Washington Academy of Sciences Scientific Achievement Award in Physical Sciences in 1974, and the Naval Research Lab's Publication Award in 1979. Griscom is a member of MRS and co-chair of the symposium, "Defect in Glasses", at the 1985 MRS Fall Meeting.

Dr. Pohanka is program manager for non-metallic materials at the U.S. Office of Naval Research, Arlington, VA. Much of his work has concerned the processing-microstructural property relationships in ceramics. He is a member of the ACerS Electronics and Basic Science Divisions. He has served on numerous Division and Society committees and is the 1984-1985 chairman-elect of the Electronics Division. Pohanka is a member of MRS and co-chair of the symposium "Electronic Packaging Materials Science," at the 1986 MRS Spring Meeting.

## John Gilman to Head Center for Advanced Materials

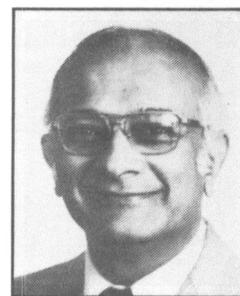
John J. Gilman, a widely experienced and recognized materials scientist, has been chosen an associate director of Lawrence Berkeley Laboratory (LBL) and director of its Center for Advanced Materials (CAM). Formerly manager of corporate research at AMOCO Corporation, Gilman took over the LBL post in July, succeeding Anthony G. Evans, who served as acting director for the past year.

Gilman will oversee CAM's research in areas of materials science that are vital to

U.S. industry. His major task, said LBL Director David A. Shirley, will be to formulate and implement scientific programs in close collaboration with advisory groups comprised of representatives of industry, academia, and government.

At AMOCO Gilman directed work in physical technology, biotechnology, synthetic fuel chemistry, and commercial development. Previously he spent 12 years at Allied Corporation, where he founded and directed the Materials Research Center and headed the Corporate Development Center. He started three business operations new to Allied: electro-optical materials, Alexandrite lasers, and METGLAS products. He has been a consultant to major companies and the U.S. Department of Energy.

Gilman is a member of the National Academy of Engineering and Fellow of both the American Physical Society and the American Society for Metals.



Rustum Roy

## Rustum Roy Vacates Directorship of Research Lab

Rustum Roy, Evan Hugh Professor of the Solid State and professor of geochemistry at Pennsylvania State University, will turn over the directorship of the university's Materials Research Lab (MRL) later this year to devote more time as director of the Science, Technology and Society Program. Roy has also headed this program for some years, and it has recently been expanded. He will continue his active research programs on novel materials synthesis and processing within the MRL.

Roy holds a BSc in chemistry and an MSc in physical chemistry from Patna University, India, and a PhD in ceramics from Penn State. He has served on the Penn State faculty since 1950. In 1960 he started and chaired the first interdisciplinary solid-state degree program in the United States, and in 1962 he was appointed to direct the MRL.

Roy is a Fellow of the ACerS and a member of the Basic Science Division, and serves on the Council of MRS.

## Awards Available to Purchase Science Teaching Equipment

Five \$2,500 awards for the purchase of science teaching equipment by colleges have been made available by The Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy. Eligible colleges must have a student enrollment of less than 2,500 and receive less than 25% of its operating budget from the Federal or state governments. For further information, contact Richard Obrycki, Koppers Company, Inc., 440 College Park Drive, Monroeville, PA 15146.

## Air Products Plasma Research at Lehigh

Air Products and Chemicals, Inc., announced the funding of a microelectronics research program to study plasma and reactive ion etching and the various combination of fluorine-based gases used in these technologies. The program will be conducted at Lehigh University at the Sherman Fairchild Laboratory for Solid Studies. The research will be directed toward expanding knowledge of the role of fluorine-based gases in dry etching technology and will include an evaluation of etching gases and combinations of gases thought to be useful in processing today's wide range of microelectronic materials. Processing information and fundamental mechanisms that lead to improving gases and processes will also be studied.

## MRC Invites Newsletter Subscribers

Materials Research Corporation (MRC) has begun publishing an industry newsletter with product and process information of interest to semiconductor and hybrid practitioners. The first issue contains an application laboratory report on advances in magnetron ion etching technology. The second issue features a report on recent silicide sputtering target improvements in purity, density, and homogeneity. Qualified industry representatives are invited to subscribe to these and future issues. Contact MRC Marketing Communication, Route 303, Orangeburg, NY 10962; telephone (914) 359-4200.

## SDI Grants Awarded

The U.S. Defense Department recently made the first awards in the Strategic Defense Initiative (SDI), which has been described as the biggest materials challenge

in history. Five universities (Auburn, Polytechnic Institute of New York, SUNY, Texas Tech, and the University of Texas) will share \$20 million to develop chemical or solar power systems for directed and kinetic energy weapons. A group of 10 universities and five corporations were awarded \$9 million to develop hybrid optical and electronic signal processors. A third grant, \$15 million, was awarded to a group of seven corporations and eight universities for development of strong, lightweight composite materials for use in large space structures such as orbiting weapons, platforms, and sensors.

## Battelle Columbus Proposes Space Center

Battelle Columbus Laboratories is proposing the establishment of an Advanced Research Center for the Commercial Development of Space under the auspices of NASA. The Center would perform generic research to help industry take advantage of opportunities in the 1990s when NASA's space station is operational. Through the station's Microgravity Materials Processing Facility, NASA will allow companies to process high value-added materials on a commercial scale in a microgravity environment. Technical areas will include electronic materials, metal alloys, glass, ceramics, fluid dynamics, and associated process technologies.

## EPRI Establishes Center for Metals Production

The Electric Power Research Institute (EPRI) has established the Center for Metals Production as a research and development applications center administered through the Mellon Institute of Carnegie-Mellon University, Pittsburgh, PA. The Center's purpose is to engage in collaborative research and technical development in order to enhance the competitiveness of U.S. metals production industries. The overall goal is to develop and transfer technical information that improves productivity and energy efficiency in primary metals production. Efforts are focused in three areas: reduction/smelting, refining/melting, and surface conditioning/protection.

## Hofmann Competition Open for Entries

Entries are invited for the seventh triennial Hofmann Competition for papers in lead research. Awards will be given for papers describing original research which, in the opinion of an international consortium of experts in metallurgy and lead technology,

adds significantly to the existing knowledge. There are two groups for entries: extractive metallurgy of lead, and physical and non-extractive metallurgy of lead. All work completed (published or unpublished) since the 1983 Hofmann Competition is eligible. Medals and certificates will be presented to the winners at the Ninth International Lead Conference scheduled for October 19-22, 1986 in Goslar, West Germany. Contact Administrator, Hofmann Medal Competition, Lead Development Association, 34 Berkeley Square, London W1X 6AJ, England. Entry information is not available from the Lead Industries Association in New York City.

## MRC Conducts Seminar on GaAs Processing

Materials Research Corporation (MRC) will conduct a seminar on GaAs processing technology December 4-5, 1985, in Newport Beach, California. GaAs practitioners including speakers from Exxon Research Labs and AT&T Bell Laboratories will join MRC scientists in an examination of current applications and potential extensions of the promising high-speed circuitry substrate. The program, titled "Thin Film Wafer Processing for GaAs," will include a technology overview plus such specific applications as sputtering of gold, silicon nitride and low-alpha high-purity silicides, GaAs devices, molecular beam epitaxy, and magnetron ion etching.

Tuition is \$475 (\$425 until October 31). Group rates are available. Contact MRC c/o Sputter School Office, Route 303, Orangeburg, NY 10962; telephone (914) 359-4200, extension 351 or 352.

## University of Pittsburgh Dedicates Surface Science Center

The University of Pittsburgh has dedicated a new \$3-million Surface Science Center. As part of the University's chemistry department, the Center has as its nucleus the Gulf Surface Instrumentation Laboratory, which was established with a grant of \$500,000 from Gulf Oil Foundation. The director of the center is John T. Yates, Jr.

## XPS Analyzer Has Multitechnique Capability

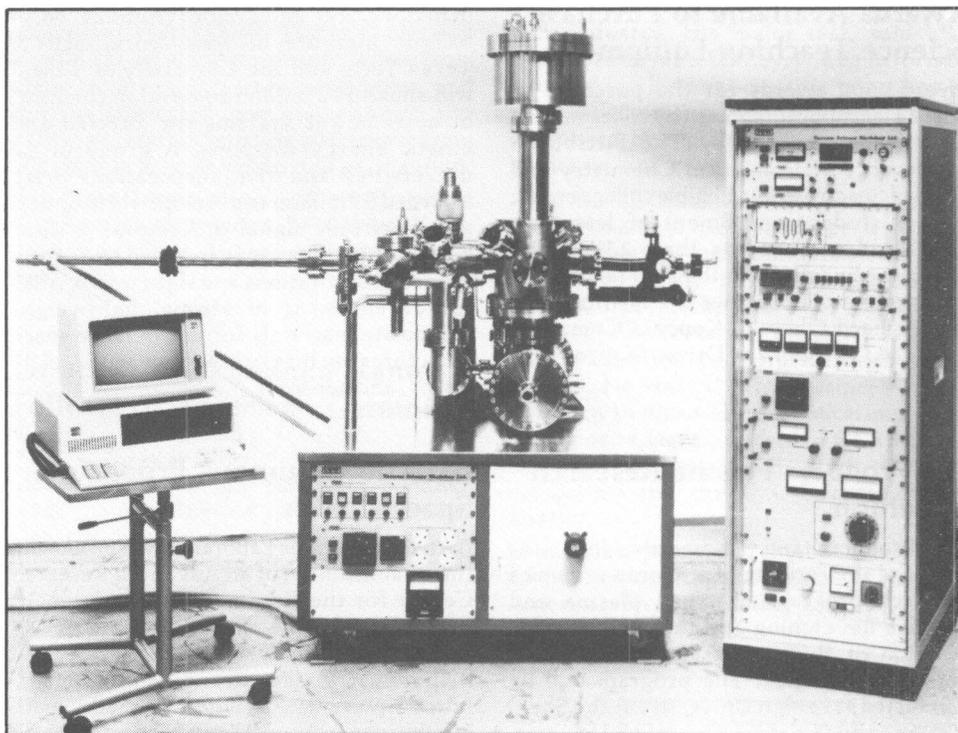
The ESCA 100, a new low-cost, surface science instrumentation package has been produced by VSW Scientific Instrument, Manchester, UK, to work with VSW's HA 100 hemispherical analyzer. The modular

ESCA 100 permits customization for R&D and budget needs while allowing for future expansion of the system

The basic ESCA 100 includes a UHV work chamber with vacuum system, hemispherical analyzer, twin-anode x-ray source, single-channel detection electronics, and power supplies. The analysis and detection system consists of a 100mm mean-radius hemispherical analyzer. A new variable (1:100) retard lens allows the analyzer to maintain high resolution at high count rates. The HA 100 is equally capable of high-resolution and sensitivity for low-energy (UPS) and high-energy (XPS) electrons.

The basic system can be expanded to include other sources for XPS, UPS, AES, and ISS. Other options include fast sample introduction, preparation chamber, multichannel detection, software for instrument control and data acquisition, and IBM or Apple computers.

For more information contact Microscience, Inc., Forbes Business Center, 182 Forbes Road, Braintree, MA 02184; telephone (617) 849-1952; telex 750 480.



ESCA 100 system, manufactured by VSW Scientific Instruments, can be expanded for XPS, UPS, AES, and ISS applications.

## 1986 AIP JOURNAL SUBSCRIPTION RATES for MRS Members

Members of the Materials Research Society are entitled to special subscription rates on 10 journals published by the American Institute of Physics. To order contact Subscription Department, American Institute of Physics, 335 East 45 Street, New York, NY 10017; telephone (212) 661-9404.

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|  | Domestic Rates |           | Foreign Rates<br>(Including Canada & Mexico) |           |
|--|----------------|-----------|--|-----------|
|  | Member         | Nonmember | Member                                       | Nonmember |
| <i>Journal of Applied Physics</i>                          | \$ 80.00       | \$495.00  | \$130.00                                     | \$545.00  |
| <i>Applied Physics Letters</i>                             | 40.00          | 300.00    | 65.00  | 325.00    |
| <i>The Journal of Chemical Physics</i>                     | 100.00         | 835.00    | 165.00                                       | 900.00    |
| <i>Journal of Mathematical Physics</i>                     | 50.00          | 530.00    | 68.00  | 548.00    |
| <i>The Physics of Fluids</i>                               | 45.00          | 475.00    | 67.00  | 497.00    |
| <i>Physics Today</i>                                       | 20.00          | 60.00     | 35.00  | 75.00     |
| <i>Review of Scientific Instruments</i>                    | 30.00          | 300.00    | 45.00  | 315.00    |
| <i>Current Physics Index</i>                               | 65.00          | 320.00    | 83.00  | 338.00    |
| <i>Journal of Physical and Chemical<br/>Reference Data</i> | 55.00          | 220.00    | 65.00  | 230.00    |
| <i>General Physics Advance Abstracts</i>                   | 12.00          | 150.00    | 24.00  | 162.00    |