## R.W. Cahn Appointed Editor of Supplement to Materials Science Encyclopedia

Robert W. Cahn has been appointed editor of a series of annual supplementary volumes to the *Encyclopedia of Materials Science and Engineering*. The eight-volume work which appeared in the Spring of 1986 is published in Europe by Pergamon Books Ltd., Oxford, and in the United States by the MIT Press, Cambridge, Massachusetts. It contains almost 1,600 articles on an enormous range of materials-related topics, and is the most extensive compilation of information on the entire gamut of materials.

Pergamon decided in 1986 to ensure that the entire work is thoroughly up to day by commissioning a series of annual supplementary volumes, to be edited by Cahn. There will probably be three volumes; the first is now in press and the second is in preparation.

Prof. Cahn, a Principal Editor for *Journal of Materials Research* and a member of the Materials Research Society, invites readers of the MRS BULLETIN to offer their views concerning topics they think are inadequately treated, or not treated at all, in the *Encyclopedia of Materials Science and Engineering*. Prof. Cahn has stated he will reply personally to all communications from MRS BULLETIN readers. Contact Prof. Robert W. Cahn, Department of Materials Science, Cambridge University, Pembroke Street, Cambridge CB 3QZ, England; telephone (44) 223-33 43 81.

*Editor's Note:* See a review of the *Encyclopedia of Materials Science and Engineering* in this issue, p. 64

## D. Apelian Named First Howmet Professor at Drexel

Dr. Diran Apelian, professor of materials engineering and associate dean of the College of Engineering, Drexel University, Philadelphia, Pennsylvania, has been named the first Howmet Professor of Materials Engineering. The professorship, sponsored through a $1 million gift from the Howmet Turbine Components Corporation, will provide $100,000 a year in research funding for Apelian's work in advanced materials processing.

In addition to assuming the Howmet Professorship, Apelian was appointed associate dean of the College of Engineering on September 1, 1988. In this capacity, he will develop and coordinate all research activity in the College. He is also director of the Aluminum Casting Research Laboratory recently established at Drexel. Apelian has been a member of the Drexel faculty since 1975, and served as head of the materials engineering department from 1983-87.

Noted for his work in solidification modeling and plasma processing of materials, Apelian is a member of numerous professional societies, including the Materials Research Society, and is a Fellow of the American Society for Metals. Apelian was a symposium organizer for two MRS symposia on the Plasma Processing and Synthesis of Materials. He is also co-editor of the subsequent proceedings, volumes 30 and 98 in the MRS Symposium Proceedings series.

## Four MRS Members Elected to National Academy of Engineering

Four members of the Materials Research Society are among the 85 engineers and seven foreign associates elected to the U.S. National Academy of Engineering this year:

**Howard K. Birnbaum,** professor of physical metallurgy, University of Illinois, "for exceptional work on the effect of hydrogen and hydrogen embrittlement on properties of metals."

**Leroy L. Chang,** manager, quantum structures, IBM T.J. Watson Research Center, Yorktown Heights, New York, "for pioneering achievements in superlattice heterostructures."

**Neville G.W. Cook,** professor of mining engineering, University of California-Berkeley, "for pioneering work on rockbursts, major contributions to rock mechanics, design of deep mines, and underground nuclear waste repositories."

**Julia R. Weertman,** professor and chairman, Department of Materials Science and Engineering, Technological Institute, Northwestern University, Evanston, Illinois, "for exceptional research on failure mechanisms in high temperature alloys."

Election to the Academy is among the highest professional distinctions accorded an engineer. Total U.S. membership is now 1,417, and the number of foreign associates is 118.

## Magnetic Process Improves Electrically Conducting Plastics

A process developed by Matt Aldissi of Los Alamos National Laboratory uses a simple magnetic field to pull polymer fibers into a straight line between the positively and negatively charged poles. The development is a major step toward overcoming technical obstacles that have limited the manufacture and use of conducting plastics. Until now, the fibers were straightened by physically stretching the material, a difficult process often left until the end of the manufacturing process.

The magnetic field is applied while acetylene gas is sprayed into a liquid crystal bath. The acetylene forms long molecular chains characteristic of polymers, and the magnetic field draws the chains into straight fibers. Once the fibers are in a straight line, an electrical current can jump from fiber to fiber with little loss in energy.

Although conducting plastics carry electricity better than some metals, such as iron, they are not yet as good as copper. Aldissi's best conducting plastics, chemically treated forms of polyacetylene, polythiophene and polypyrrole, are about one-fourth as conductive as copper.

## Workshop to Discuss Surface Science Opportunities at the Advanced Light Source

A two-day workshop, April 28-29, 1988 at Lawrence Berkeley Laboratory, Berkeley, California, will bring together potential users of the Advanced Light Source (ALS) to plan scientific and instrumentation strategies. Construction on the ALS has begun, and completion is projected for 1992.

A major goal of the workshop will be to discuss the performance goals and priorities for the ALS insertion devices required to best meet the needs of the surface science community. The ALS Users Executive Committee that organized the meeting also hope the workshop will catalyze the formation of user groups that may, for example, center around a specific insertion device or bending magnet beamline.

The program will consist of several presentations by invited speakers and discussion periods with ample time for open exchange of ideas by all participants. ALS project staff will be present, including those responsible for its design and construction and specialists in optics and beamlines.

For information, contact the meeting co-chairs:

Wolfgang Eberhardt
Exxon Research and Engineering
Route 22 East
Annandale, NJ 08801
Telephone (201) 730-2567

or

Charles Fadley
Department of Chemistry
2545 The Mall
Honolulu, Hawaii 96822
Telephone (808) 948-6401

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## Aluminum Casting Research Lab Established at Drexel

The Aluminum Casting Research Laboratory (ACRL) was formally established at Drexel University, Philadelphia, Pennsylvania, during ceremonies held on March 11, 1988. The Laboratory will address scientific and engineering problems associated with the production and use of aluminum castings. The Laboratory's goal is to provide a forum where industrial and academic sectors can interact to solve industrial problems, transfer technology from academia to the industrial community, and advantageously participate in the training of future engineers.

Ongoing research projects at the Laboratory include the following studies: structure-property relationships in cast A-356 alloy, monitoring of grain refinement and modification via thermal analysis, development of modifying/alloying compounds, filtration of aluminum alloys, flow behavior of deformable inclusions, and effect of slip and fluidity.

The ACRL is funded primarily by participating industrial members and guided by an advisory board. The 14 currently participating companies include primary aluminum producers, casting manufacturers, and suppliers of foundry products. The director of the Laboratory is Prof. Diran Apelian.

## Ceramic Filter Investigated for Coal-Fired Power Plants

Under a research contract awarded by the U.S. Department of Energy, Westinghouse Electric Corporation (Pittsburgh, Pennsylvania) will scale up an innovative ceramic cross-flow filter and test it at a coal gasification pilot plant operated by Texaco Inc. in Montebello, California. Under development since the late 1970s, the filter is projected to be capable of capturing more than 99% of the tiny particles of mineral matter and ash released in the gas stream when coal is gasified.

The ceramic cross-flow filter can remove particles at temperatures of 1500°F or more, reducing the costly cool-down required by current conventional particulate removal systems. Current systems only work effectively at 200°F or less. Coal gases can be 1000° to 3000°F.

The filter, to be fabricated for Westinghouse by Coors Porcelain of Denver, Colorado, is essentially a box of corrugated layers each positioned at a right angle to the layer below. Particle-laden coal gases pass through the gas-permeable layers and emerge at right angles cleaned of their impurities.

Single filters six inches square by two inches thick have already been tested on small gasifiers. Westinghouse will scale up the filter element to hold two filters, each 12 inches square and four inches deep. In future commercial-scale plants, it is anticipated that several hundred of these filter elements will be arranged in a pressure vessel which could be up to 20 ft high and 13 ft in diameter.

## Castable Getter Absorbs Hydrogen Without Forming Water

A hydrogen getter based on a mixture of a polymer and a catalyst can take up relatively large amounts of hydrogen without producing water and can be cast into free-standing structures. Unlike systems which remove hydrogen catalytically, the thermoplastic material functions without oxygen.

A solution of triblock copolymer (polystyrene/polybutadiene/polystyrene) is combined with an iridium-containing catalytic compound (Crabtree catalyst). After removal of the solvent, the mixture consists primarily of polymer, with catalyst loadings ranging from 10% to well under 1%, depending on the intended application.

According to Laura R. Gillion, the Sandia National Laboratories scientist who developed the material, potential applications are to be found in weapon systems, radioactive waste storage and transportation systems, and devices for removing tritium.

The material was tested for gettering efficacy by adding hydrogen at low pressures. The normally rubbery material stiffens as it takes on hydrogen, eventually becoming a semicrystalline material as hydrogenation is completed. Analysis of the hydrogenation testing with proton NMR spectroscopy showed that hydrogen uptake is not affected by the presence of water vapor in the environment and that trimethylamine will act as an inhibitor, reducing both the reaction rate and hydrogen takeup capacity. While poisoned by carbon monoxide, the reaction is unaffected by the presence of molecular oxygen.

Experiments using a plug of getter slightly foamed by solvent evaporation showed an uptake of 250 $cm^3$ hydrogen per gram of getter (theoretical capacity is 275 $cm^3/g$) at an initial rate of 50-100 $cm^3/h$. The uptake rate is reduced when the same material is in pellets.

Gilliom is a member of the Materials Research Society.

## Argonne Superconductivity Research Merits DOE Award

Superconductivity research performed at Argonne National Laboratory merited an award in the U.S. Department of Energy's 1987 Materials Sciences Research Competition. The Outstanding Scientific Accomplishments Award in the solid state physics category was given for research entitled "Structure of High Temperature Superconductors." Argonne researchers on the project included Donald Capone, David Hinks, James Jorgensen, Ivan Schuller (now at San Diego State University), Mark Beno, and Lynda Soderholm. Capone, Hinks, and Schuller are members of the Materials Research Society.

## EPITAXX to Develop Large-Area InGaAs Photodetectors

EPITAXX, Inc. in Princeton, New Jersey will develop large-area indium gallium arsenide photodetectors for the 500-1,700 nm spectral range. The detector will serve as a single standard reference detector for both visible and near infrared light and eliminate the need to use two detectors (typically silicon and germanium). The development is being funded by a Phase II Small Business Innovative Research contract awarded by NASA Goddard Space Flight Center.

Under the Phase I contract EPITAXX delivered 5-mm-diameter InGaAs detectors which had quantum efficiencies from 40 to 70% over the 500-1,700 nm range. Phase II goals include improving vapor phase epitaxy techniques to utilize 2- and 3-inch-diameter indium phosphide substrates. The substrates improve uniformity and enable achieving 50% quantum efficiencies across the entire spectrum.

The detectors would find applications in NASA programs dealing with space astronomy, geophysics and remote sensing, as well as commercial use in fiber-optic and infrared test equipment. □

**Send NEWS to:**

*Editor*
MRS BULLETIN
9800 McKnight Road, Suite 327
Pittsburgh, PA 15237
Telephone: (412) 367-3036
Fax: (412) 367-4373



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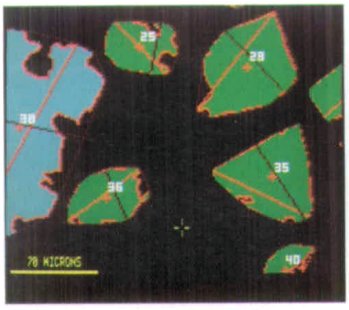


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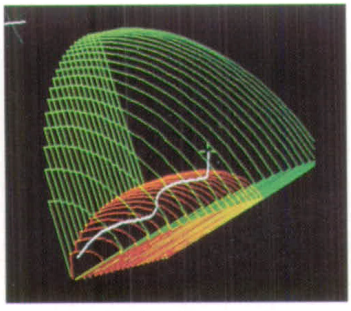

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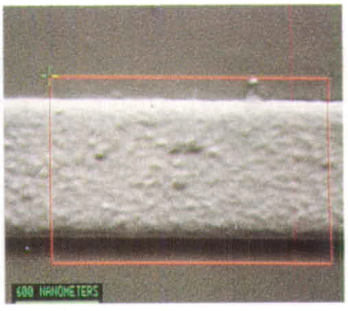


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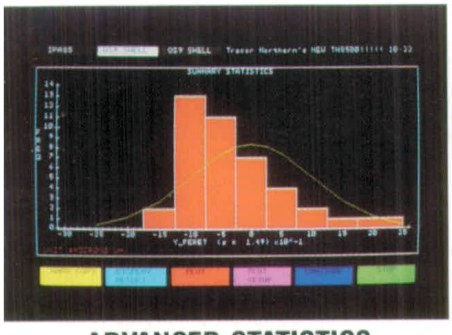
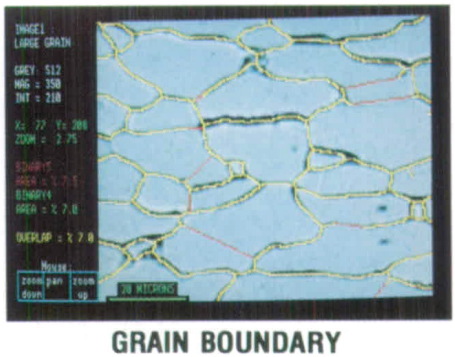


ADVANCED STATISTICS

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