

## Congressmen, Hewlett-Packard Board Chairman Receive NSF Distinguished Public Service Award

Congressman George E. Brown Jr., chairman of the House Subcommittee on Department Operations, Research and Foreign Agriculture; former Congressman Emilio Q. Daddario; and John A. Young, chairman of the board of Hewlett-Packard Corporation, received the Distinguished Public Service Award of the National Science Foundation (NSF) at ceremonies held May 10 at the State Department.

The award, the highest made to persons outside the agency, is given periodically to those who have distinguished themselves through leadership, public service and dedication in support of American science and engineering and science and engineering education.

"All three of these outstanding leaders recognized early and promoted consistently the value of basic research as the fun-

damental force behind scientific advancement and technological achievement," said NSF Director Erich Bloch.

Representative Brown began his congressional career in 1963 and has been a proponent of strengthening America's science and engineering research and education enterprise. His leadership led to the creation of the Office of Science and Technology Policy in 1976 and the establishment of the Office of Technology Assessment in 1972. He has served as a member of the Technology Assessment Board since its inception.

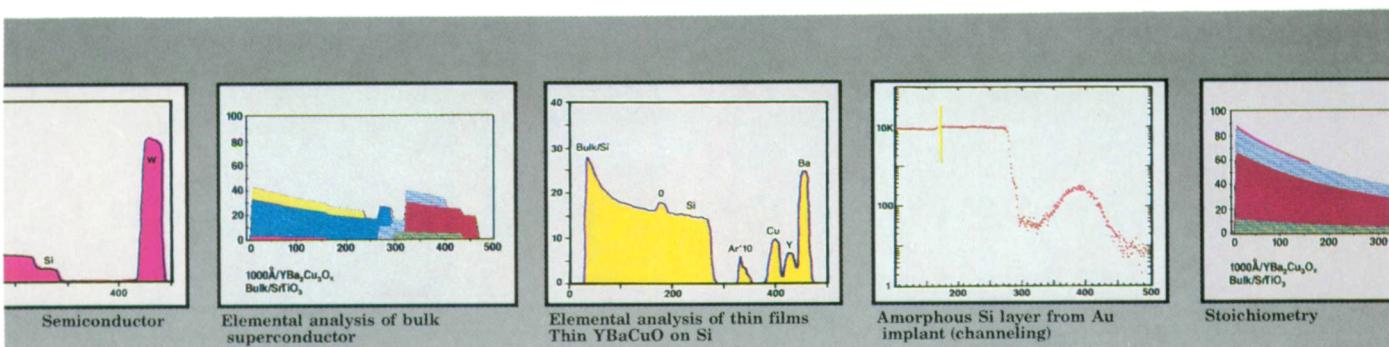
Daddario served as a member of Congress from 1959 to 1971 and as director of the Office of Technology Assessment from 1973 to 1977. As a member of the Science and Astronautics Committee, he established a new Subcommittee on Science, Research and Development and served as first chairman of that subcommittee. He was instrumental in guiding through Congress the legislation that led to the establishment of the Office of Technology Assessment.

Young joined Hewlett-Packard in 1958. He became president in 1977, chief executive officer in 1978, and chairman of the board in 1983. In that year he was named by President Reagan to be chairman of the President's Commission on Industrial Competitiveness. Young then created and served as chairman of the Council on Competitiveness.

*Editors Note:* Congressman Brown was the plenary speaker at the 1986 MRS Fall Meeting in Boston. See the *MRS BULLETIN*, Jan./Feb. (1987) p. 72.

## Chitosan-Coated Fibers Could Find Use in Bandages, Filters, Packaging Materials

Fibers coated with the polymer chitosan may open the door to numerous new biomedical applications and also find use in filters for removing toxic substances from air and water and in packaging materials that hold their strength when wet. According to researchers at the University of Washington, wood pulp and glass fibers



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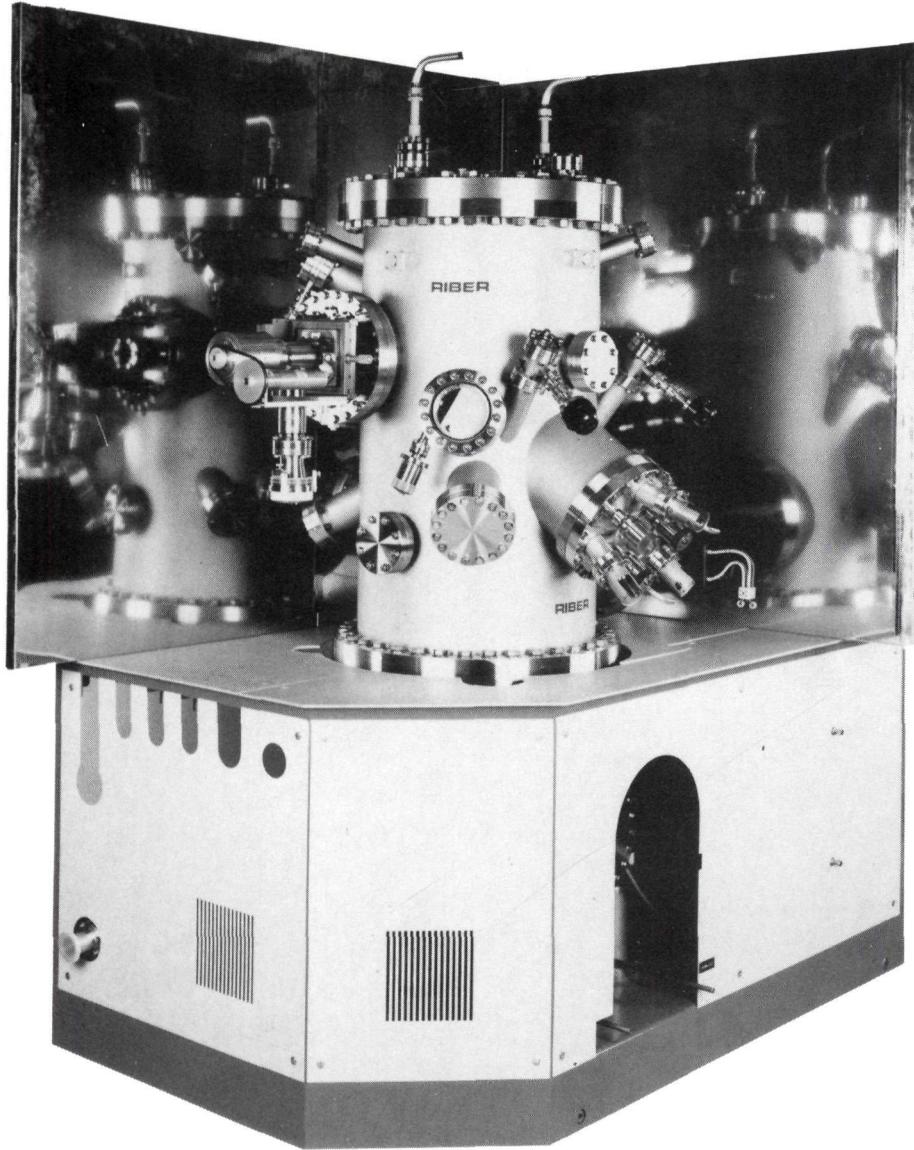
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can be coated with chitosan and formed into nonwoven paper sheets which have different properties than sheets made with noncoated fibers.

Chitosan, used commercially in Japan to remove suspended solid particles from sewage sludge, is derived from shrimp and crab shells by chemically removing the protein and minerals. Although chitosan is an expensive polymer at \$5 per pound, the researchers say that coating the large surface area of fibers makes a little of the chitosan go a long way.

University of Washington graduate student Jack Winterowd, a member of the research team, said that several studies have shown that drugs encapsulated in chitosan and applied to wounds were delivered in a time-release fashion, much like a 12-hour cold capsule, but in a surface application.

According to Winterowd, the coated fibers have a high affinity for heavy metals and could also be used in filters installed in waste water streams to remove toxic metals. The fibers also react quite readily with formaldehyde, he said, and potentially could be used in laboratory face masks and furnace filters.

Paper made from chitosan-coated wood pulp fibers has a much higher wet strength, Winterowd said. Glass fibers not coated with chitosan are difficult to form into paper because the fibers don't stick together well.

Wood and glass fibers coated with chitosan form a uniform suspension in water because they are hydrophilic and form a sheet with a uniform distribution of fibers. Chitosan seems to have an attraction to glass and wood pulp fibers, and makes an excellent "glue" to hold the fibers together. Winterowd was also able to coat polypropylene fibers, and although he was unable to form the fibers into a sheet, the chitosan coating enabled the fibers to be dyed.

The wood pulp, glass, and polypropylene fibers were coated with chitosan by suspending them in rapidly stirred acidic solutions of chitosan, followed by adding an alkaline compound such as sodium hydroxide. During this process, the chitosan precipitated out of solution and onto the suspended fibers.

Winterowd presented a paper detailing his research at the symposium on Materials Interactions Relevant to the Pulp, Paper, and Wood Industries during the 1990 MRS Spring Meeting in San Francisco. Co-authors and other members of the research team are G. G. Allan, John P. Carroll, Yasuhiko Hirabayashi, and Mutombo Muvundamina.

## Worcester Polytechnic Selects Apelian as New Provost

Diran Apelian has been named provost and vice president for academic affairs at Worcester Polytechnic Institute (WPI), Massachusetts. Apelian, who leaves his position as associate vice president for academic affairs and graduate studies and Howmet Professor of Materials Engineering at Drexel University in Philadelphia, becomes WPI's chief academic officer on July 1, 1990, succeeding Richard H. Gallagher, who left to become president of Clarkson University in July 1988.

Apelian served at Drexel University in various capacities since 1975, becoming associate vice president for academic affairs and graduate studies for all programs at Drexel in 1989. During his tenure at Drexel, Apelian was instrumental in establishing multidisciplinary research centers, and the college's research expenditures reached \$9 million per year.

Apelian earned his BS degree in metallurgical engineering from Drexel University in 1968 and his ScD in metallurgy and materials science from the Massachusetts Institute of Technology in 1972. His materials research activities span clean metal/melt refining, plasma processing, spray forming/casting, continuous casting, aluminum casting, and structure characterization. In April of this year he received the Scientific Merit Award of the American Foundrymen's Society.

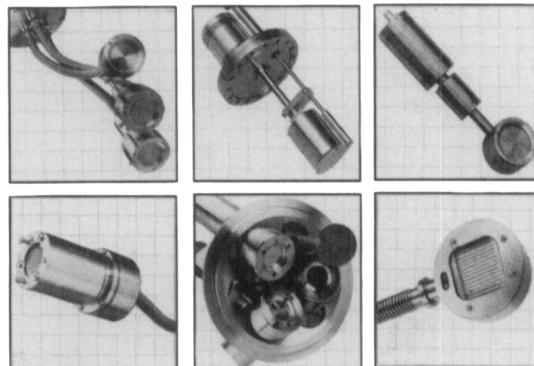
Apelian is active in national and international engineering organizations. He was elected a Fellow of the American Society for Metals in 1987 and is a member of numerous professional and honorary societies, including MRS. He has co-organized several MRS symposia on the plasma processing and synthesis of materials.

## FY1991 University Research Initiation Program Competition Announced

The Department of Defense has announced the opening of a competition to award \$15 million over three years for new projects starting in 1991 under the Research Initiation Program, one component of DOD's University Research Initiative (URI).

The Research Initiation Program was begun in 1989 to broaden participation in the URI and further strengthen the nation's overall infrastructure for university research and science and engineering graduate education in defense-critical fields. To encourage broader participation, the 1991 Research Initiation Program is open specif-

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ically to academic institutions that received less than \$3 million per year in DOD obligations for research and development in recent years. Historically Black colleges and universities, and other minority institutions will be considered regardless of the amount of funding they have received from DOD in previous years.

The Army Research Office, Office of Naval Research, Air Force Office of Scientific Research, and Defense Advanced Research Projects Agency are seeking proposals (in specific technical areas identified below) for three-year research efforts in the range of \$50,000 to \$250,000 per year. As in past years, proposers are encouraged to request major instruments needed to perform the intended research and to budget more for instrumentation than the 10-15% typically allotted within DOD's university research awards. To promote technology sharing and transfer, priority will be given to proposals that include nonfederal cost-sharing or cooperative agreements with state and local governments, national and defense laboratories, industry, and existing research centers of excellence.

Proposals must be received by the appropriate research office by **September 13, 1990**. Subject to the availability of appropriations, the Department plans to award \$5 million in first-year support during 1991 to the three-year projects selected in this competition.

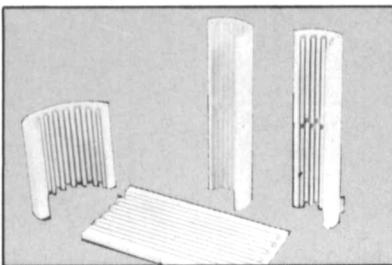
A brochure "Announcement for the DOD University Research Initiative, Research Initiation Program, Fiscal Year 1991" contains more detailed descriptions of the technical areas, as well as instructions for proposal preparation and submission. To obtain a copy, write directly to the research office soliciting proposals:

For smart materials and structures, write to: Materials Science Division, ATTN: URI '91, U.S. Army Research Office, P.O. Box 12211, Research Triangle Park, N.C. 27709-2211.

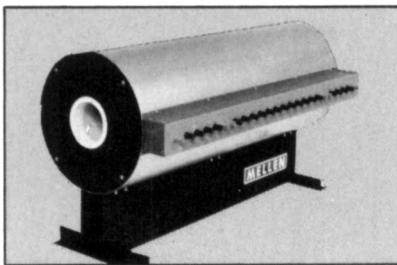
For material synthesis based on biological models and chemical routes, write to: Materials Division or Molecular Biology Division, Code 1131, Room 704, ATTN: URI '91, Office of Naval Research, 800 North Quincy Street, Arlington, Va 22217-5000.

*Continued...*

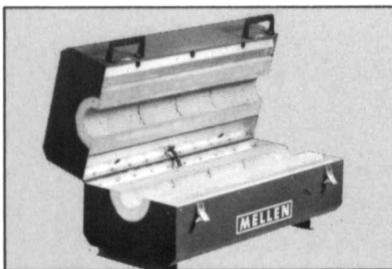
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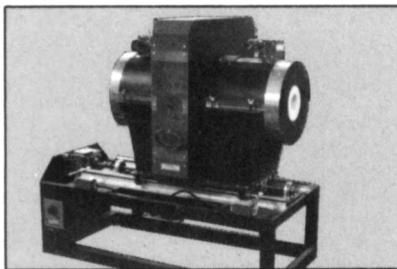
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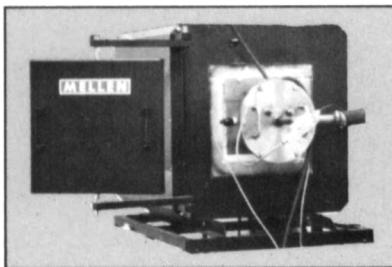
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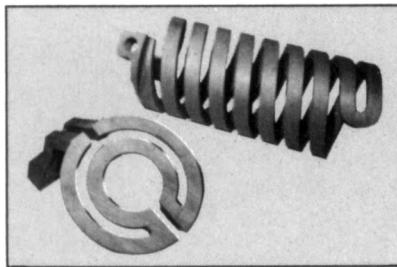
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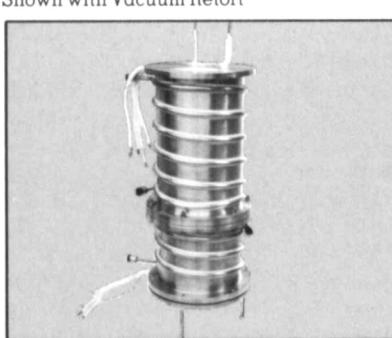
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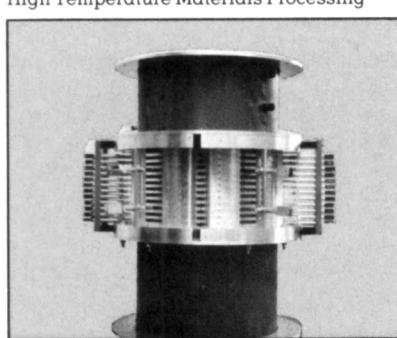
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For research related to high-speed/high-density digital electronic packaging, write to: Defense Sciences Office, ATTN: URI '91, Defense Advanced Research Projects Agency, 1400 Wilson Boulevard, Arlington, Va 22209-2308.

The text of the brochure is also available on-line from FEDIX, Office of Naval Research section, at (301) 353-9520 (data only). The telephone number for voice communication with FEDIX is (301) 353-9542.

### **Condrate Elected Fellow of Royal Society of Chemistry**

Robert A. Condrate Sr., professor of spectroscopy at the New York State College of Ceramics at Alfred University, has been elected a Fellow of the Royal Society of Chemistry, London, England. The honor recognizes Condrate's work in analyzing the structure of solid-state inorganic compounds. The Royal Society of Chemistry has a worldwide membership of about 40,000. Condrate was elected a member and chartered chemist of the Royal Society of Chemistry in 1984 on the recommendation of the American Institute of Chemists, of which he is also a Fellow. Condrate, a member of the Materials Research Society, has taught at Alfred University since 1967, and has had work published in more than 100 professional journals and textbooks.

### **Tech Transfers Issues and Materials Research are Focus of Dental Conference**

The Center of Excellence for Materials Science Research, funded by the National Institute of Dental Research, will hold a one-day conference on dental restorative materials on July 27, 1990, at the National Institute of Standards and Technology, Gaithersburg, Maryland.

Nearly 100 dental materials manufacturers and distributors have been invited to the conference, which will focus on issues relating to technology transfer and research being conducted at the Center, an agency of the American Dental Association Health Foundation.

Current research at the Center focuses on the development of resin systems that have minimal dimensional change, materials that are effective and easily fabricated into shields for patients undergoing head and neck radiation therapy, protective tooth coatings that will adhere to both

enamel and dentin, "synthetic dentin," and glass-ceramic inserts/inlays for composite dental restorations.

"One of the major objectives of this Center is to involve nondental materials scientists and engineers in dental materials research," said Director Rafael L. Bowen. Bowen, doctor of dental surgery, invented dental composites. "We are still in the early stages of developing an information network, which includes a monthly seminar series, a newsletter directed to dental materials R&D managers, and the annual conference on dental restorative materials," he added.

For information about the Center's research programs, the July 27 conference and other center activities, contact W.A. Marjenhoff, Administrative Manager, NIST Bldg. 224, Room A-153, Gaithersburg, MD 20899. The Center's telephone number is (301) 975-6806; fax (301) 963-9143.

### Oak Ridge Etching Technology Licensed to Sematech

Martin Marietta Energy Systems, Inc., has granted commercial rights to Sematech, Inc., for technology improvements developed at the Department of Energy's Oak Ridge National Laboratory that could enable U.S. manufacturers to produce better semiconductor chips for the electronics industry.

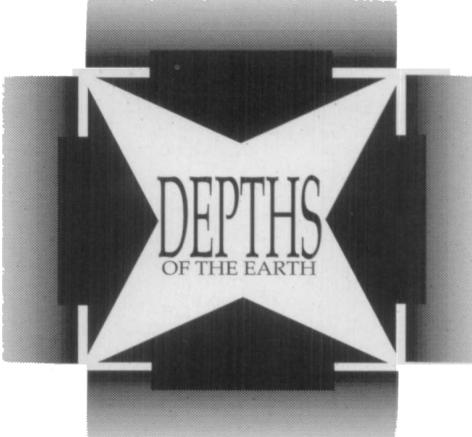
The technology involves precision plasma etching techniques for fabricating high-density semiconductor chips, and advances developed by Chin-Chi Tsai and Lee A. Berry of Oak Ridge's Fusion Energy Division and Steven M. Gorbatkin of the Solid State Division.

Under a Work-for-Others agreement with Sematech announced last year, Oak Ridge researchers will pursue additional refinements to the licensed technology and evaluate several experimental etching concepts for fabricating high-density semiconductor chips. After Sematech selects the best technology, it will be transferred to a U.S. tool manufacturer who will incorporate the technology into a production tool.

### NAE Elects New Officers, Councillors

Members of the National Academy of Engineering have elected a new chairman and vice president, and named a new member to the Academy's governing Council. In addition, the NAE's treasurer and two councillors have been reelected. All terms begin July 1, 1990.

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Richard M. Morrow, chairman and chief executive officer, Amoco Corp., Chicago, will become the NAE's new chairman, elected to a two-year term. Morris Tanenbaum, vice chairman and chief financial officer, AT&T, Basking Ridge, NJ, was elected to a four-year term as vice president. He currently serves as an NAE Council member. Tanenbaum, who began his career with Bell Labs in 1952, was the inventor of the first practical process for making silicon transistors and led the research team credited with discovering practical materials for

superconducting magnets. Newly elected to the Council for a three-year term was James F. Gibbons, dean of engineering, Stanford University.

Reelected to NAE posts were: Edward R. Kane, former president, E.I. du Pont de Nemours & Co. Inc., Wilmington, DE; treasurer, for three years; George Bugliarello, president, Polytechnic University, Brooklyn, NY; councillor, for three years; and John L. Lucas, chairman, Questech Inc., Falls Church, VA; councillor for three years.



### J. Taylor Awarded U.S. Patent for Superconductor Melt Processing

A basic U.S. patent for melt texturing processing of  $\text{Ba}_2\text{YCu}_3\text{O}_{7-x}$  has been awarded to Alfred University researcher Jenifer Taylor for work done in the Institute for Ceramic Superconductors. Taylor originally described the textured microstructure that resulted from high temperature sintering studies in 1987 at the November meeting of the American Ceramic Society. The work was done under her supervision by Prinya Sianamthip, a research associate, and David F. Dockery, a graduate student.

Thermal treatment recommended at the time avoided processing above the liquidus because of the decomposition of the superconducting phase to liquid and  $\text{BaY}_2\text{CuO}_5$ . An assumption was made that maximum volume percent  $\text{Ba}_2\text{YCu}_3\text{O}_{7-x}$  was the primary objective. Contrary to expectations, processing in the presence of a liquid phase did not degrade superconducting properties but led to the formation of a textured microstructure. Sintering for 2.5 hours at 1050°C followed by a high tem-

perature anneal at 980°C produced samples with significant grain orientation. In addition, the material was denser and resistant to water corrosion.

Other research groups trying to make bulk superconductors with a reasonable current density have refined and extrapolated melt processing as a fabrication technique. Working with a steep thermal gradient, researchers at AT&T Bell Laboratories have reported bulk superconductors with critical currents of approximately 20,000 A/cm<sup>2</sup>. Also using a gradient, K. Salama, working with Paul Chu's research group at the University of Houston, has reported transport current of 70,000 A/cm<sup>2</sup>. Scientists in Japan have developed a variation that involves quenching from the melt which also produces oriented microstructure.

### Academies Create Forum to Address U.S. Manufacturing Performance

In an effort to help U.S. companies compete more effectively in world markets, the National Academy of Engineering and the National Academy of Sciences have convened the Manufacturing Forum, a new

standing committee that will assess public policies and programs and private-sector actions affecting U.S. manufacturing performance.

Created by the Academies in response to a request from the White House Office of Science and Technology Policy and the National Science Foundation, the Forum is expected to discuss a broad range of topics, such as trends in manufacturing performance, technology development and utilization, incentives and disincentives for investment, improvements in management practices, trends in the labor force, and educational requirements for manufacturing excellence. The Manufacturing Forum is modeled in part on the Academies' successful experience with the Government-University-Industry Research Roundtable, created in 1984, which brings together leaders from government, universities, and industry for dialogue on themes of common concern.

The Forum is composed of senior government officials and leaders from the private sector with corporate, labor, and academic experience. Chairman of the Forum is Reuben F. Mettler, retired chairman and chief executive officer of TRW Inc., Cleveland, Ohio, and current chairman of the board of the California Institute of Technology. NAS President Frank Press and NAE President Robert White serve as ex-officio members.

### J.D. Mackenzie Appointed to University of California Chair

John D. Mackenzie has been appointed chair of the N.S.G. Professorship of Materials Sciences at the University of California, Los Angeles. Mackenzie, professor of engineering and applied science in UCLA's Department of Materials Science and Engineering, is the first chair of the new professorship recently endowed by the Nippon Sheet Glass Company of Tokyo, Japan.

Mackenzie received a BSc degree in chemistry and physics from Birkbeck College, London, and a PhD in physical chemistry from Imperial College, London. His professional career has spanned positions at Princeton University, Cambridge University (England), the General Electric Research Laboratory, and Rensselaer Polytechnic Institute. He has been with UCLA since 1969 and was chairman of the Materials Science and Engineering Department from 1979-1982.

The recipient of numerous honors, Mackenzie is a member of the National Academy of Engineering and several professional societies, including MRS. He has over 200 scientific publications to his credit and holds 13 U.S. patents. □

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