

IN BRIEF

The recipient of the 18th Marconi International Fellowship Award is **James L. Flanagan**, Board of Governors Professor of Electrical and Computer Engineering at Rutgers University and the director of the Center for Computer Aids for Industrial Productivity there. The award, given by the Marconi International Fellowship Council, cites "his pioneering contributions to speech technology."

The 1992 Harvey Prize in Technology, which is given by the Technion in Haifa, Israel, was awarded in June to **Amnon Yariv**, the Thomas G. Myers Professor of Electrical Engineering and professor of applied physics at Caltech. The award recognizes his contributions toward human progress in science and technology.

The first International Ceramics Prize of the Academy of Ceramics was given to **Robert E. Newnham**, the Alcoa Professor of Solid State Science at Pennsylvania State University, in June. He was cited for "distinguished, creative and exceptional interdisciplinary contributions to the advancement of ceramic science and culture, especially in composite electroceramics, including intelligent ceramics."

The Royal Society gave the 1992 Rumford Medal to **H. N. V. Temperley**, emeritus professor of applied mathematics at the University of Wales. He was cited for his "contributions to applied mathematics and statistical physics, especially in the physical properties of liquids and the development of the Temperley-Lieb algebra." **M. J. Seaton**, emeritus professor of physics at University College, London, was given the 1992 Hughes Medal by the Royal Society for his "theoretical research in atomic physics, and leadership of the Opacity Project."

OBITUARIES

Francis Birch

Francis Birch died of cancer on 30 January 1992 at his home in Cambridge, Massachusetts, at the age of 88. Birch was a pioneer in applying condensed matter physics to physical properties of minerals and rocks and to the deduction of the Earth's internal composition, mineralogy and temperature.

Born in Washington, DC, Birch received his undergraduate degree in engineering from Harvard College in

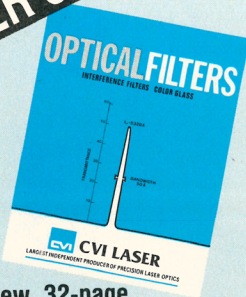
1924. He then worked for two years at the New York Telephone Company. An American Field Service fellowship enabled him to spend 1926-28 at the Institut de Physique in Strasbourg under Pierre Weiss. This experience reinforced his determination to do research, and he returned to Harvard, where he completed a PhD in physics under Percy W. Bridgman in 1932. Recognizing the need to understand geological materials at high pressures and temperatures in order to comprehend the nature of the Earth's deep interior, Bridgman and Reginald Daly of Harvard's geology department set up the Committee on Experimental Geology and Geophysics, and Birch headed its research efforts. This work was done in the Dunbar Laboratory until 1963, when they moved to the newly built Hoffmann Laboratory.

During World War II Birch was a Navy officer and worked at the MIT Radiation Laboratory and at Los Alamos on developing the atomic bomb, matters that he rarely discussed. He rose from his first position at Harvard, as research associate in 1933 to become Sturgis Hooper Professor of Geology at Harvard in 1949 and professor emeritus in 1974; he still continued his research after retiring. Through Birch's laboratory passed students and postdoctoral fellows who became leaders of geophysics in subsequent years.

One measure of a scientist's contribution is the number of new fields that develop from his initial work, and by this standard Birch stands as one of the creators of geophysics during its formative years in the middle of the 20th century. Several areas of research in Earth sciences virtually originated with his work on equations of state, thermal conductivity, determination of continental heat flow and inference of the Earth's composition.

Using Francis D. Murnaghan's finite-strain theory, Birch developed what is termed the Birch or Birch-Murnaghan equation of state for isotropic solids in 1938. With a single parameter, the isothermal bulk modulus, this equation of state provides density-pressure relations for compressions up to several tens of percent. It was a valuable guide for extrapolation to conditions of planetary interiors before diamond anvil cells and shock compression attained the corresponding pressures, and it is now widely used to interpret elastic properties obtained from those techniques. Combining equations of state with thermodynamic relations, Birch wrote one of the classic papers in

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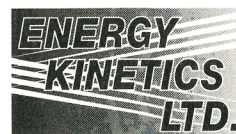
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