

## Black-hole theoreticians honored

Stephen W. Hawking, at age 33 the youngest member of the Royal Society, has been awarded two prizes for outstanding research in astrophysics and general relativity—the Royal Astronomical Society's Eddington Medal, which he shares with Roger Penrose of Oxford University, and the Pius XI Medal.

Hawking and Penrose have received the Eddington Medal for joint research on singularities (areas, such as black holes, where classical concepts of space and time are void) in general relativity. Their studies have led to the conclusion that singularities associated with very high densities must have existed in the universe in the past. Hawking has suggested that microscopic black holes might have been formed in the early universe and has proved theorems about the highest amount of useful energy that can be released by matter falling into a black hole.

The Eddington Medal is awarded

every three years and the Pius XI Medal is presented every two years to a scientist under 35 years of age who has achieved an international reputation. Hawking received the medal in Rome from Pope Paul VI.

Hawking earned his doctorate in physics from Cambridge University, where he is a research assistant in applied mathematics and theoretical physics. He is now pursuing his research at the California Institute of Technology as a Sherman Fairchild Distinguished Scholar.

Penrose has been Rouse Ball professor of mathematics at Oxford University since 1973. He earned his doctorate from Cambridge University and has been a NATO fellow and a visiting professor at several US universities. In appreciation of his contributions to relativity, he was awarded in 1971 the American Physical Society-American Institute of Physics Dannie Heineman Prize for mathematical physics.

and has written several text and reference books in the field. He is now studying polymer behavior in fire and ways to reduce the hazards of burning, and has extensive commitments as a guest lecturer in the US and abroad.

## Weinberg named director of energy-analysis group

Alvin M. Weinberg will assume the post of director of the Institute for Energy Analysis for Oak Ridge Associated Universities on 1 July. IEA examines energy problems from social, political, economic and technological points of view and provides its analyses to governmental policy-making groups.

Weinberg was involved in the Institute's establishment in January 1974 and served briefly as its director prior to becoming head of research and development for the Federal Energy Office. A specialist in nuclear physics and science policy, he earned his doctorate in physics from the University of Chicago in 1939. During Weinberg's absence from IEA, H. G. MacPherson, associate professor of physics at the University of Tennessee, served as acting director. Weinberg was director of Oak Ridge (now Holifield) National Laboratory during 1955-73.

## ACS Gibbs Medal awarded to Mark

Polymer chemist Herman F. Mark has been awarded the Willard Gibbs Medal by the Chicago section of the American Chemical Society. This medal is one of the highest chemistry honors presented in the US.

Mark, who is dean emeritus of Polytechnic Institute of New York, has been engaged in polymer research for more than 50 years. He collaborated on the first x-ray analyses of natural polymers and on early applications of radioisotopes and photochemical techniques to polymer studies. He and his colleagues were among the first to explain how a polymer's structure determines its mechanical properties and behavior over thermal gradients. An equation Mark developed with Eugene Guth relating solution viscosity and molecular weight is still regarded as the most convenient practical way to determine a polymer's molecular weight. During the 1950's Mark and his students helped to elaborate the process of copolymerization via work on graft and block copolymers.

In 1940 Mark established PINY's Polymer Research Institute, which in-



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side of ten years had developed the first complete polymer curriculum in the US. He founded and became editor of the *Journal of Polymer Science* and the *Journal of Applied Polymer Science*

## Engineers present major medals to five scientists

The Institute of Electrical and Electronics Engineers has presented its most prestigious awards to five scientists. John R. Pierce has received the Medal of Honor; Sidney Darlington, the Edison Medal; John Grist Brainerd, the Founders Medal; Harold B. Law, the Lamme Medal and Charles A. Desoer, the IEEE Education Medal.

The Medal of Honor—which includes a certificate, gold medal and \$5000—is IEEE's highest, and has been presented to Pierce in recognition of his achievements in communication satellite experiments and his work on electron-beam devices. In 1971 Pierce retired from a 35-year career at Bell Laboratories, where he was executive director of research in the communications sciences division. He is now professor of engineering at the California Institute of Technology.

Darlington holds a PhD in physics from Columbia University. He re-