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absence from MIT, Weisskopf began his tenure as Director-General of CERN. On his return to MIT, he was made an Institute Professor. In 1967 Weisskopf became head of the MIT physics department, a title he held until his retirement in 1973.

With John Blatt, Weisskopf wrote *Theoretical Nuclear Physics* (Springer-Verlag, New York, 1979; originally published by Wiley, New York, 1952), and with Kurt Gottfried, he wrote *Concepts of Particle Physics* (Oxford U.P., New York, 1984 and 1986). Weisskopf has also written a book not aimed at a strictly scientific audience, *Knowledge and Wonder: The Natural World as Man Knows It* (MIT Press, Cambridge, Mass., 1979; originally published in 1962).

RASHID SUNYAEV WINS 1988 ROSSI PRIZE

The 1988 Rossi Prize of the high-energy astrophysics division of AAS has been awarded to Rashid Sunyaev of the Space Research Institute (IKI), Moscow. The prize is awarded annually for a significant contribution to high-energy astrophysics, with particular emphasis on original work. The prize is named in honor of Bruno Rossi, a pioneer in x-ray and γ -ray astronomy. Sunyaev's award is in recognition of his contributions to understanding cosmic x-ray sources, especially the structure of accretion disks around black holes, the x-ray spectra of compact objects and the hard x-ray

emission from supernova 1987a.

In the early 1970s Sunyaev helped develop what has become the standard model of plasma disks around black holes, both in interacting binary systems and in active galactic nuclei. The standard model made possible a qualitative understanding of many of the observed properties of these objects. In the late 1970s and early 1980s Sunyaev contributed to the understanding of the interaction of x rays and γ rays with a plasma cloud by showing how such a cloud can profoundly alter the appearance of emitted radiation. For example, such a cloud could give rise to power-law spectra like the x-ray emission of the black-hole candidate Cygnus X-1 and the visible and near-infrared continuum emission of many quasars.

Sunyaev is the leader of the Soviet team that used the Röntgen instruments on the Kvant observatory (attached to the Mir space station) to discover hard x-ray emission from SN1987a in mid-August 1987, several months earlier than x rays were expected. This work was done in collaboration with scientists from West Germany (FRG), The Netherlands and the UK. (See the news story in *PHYSICS TODAY*, January 1988, page 20.)

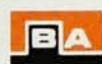
Sunyaev graduated from the Moscow Physical Technical Institute in 1966. In 1968 he earned the degree of Candidate of Science (equivalent to a PhD) in astronomy from Moscow University; in 1973 he was awarded the university's doctor of science degree. He worked with Yakov Zel'dovich as student, postdoc and col-



Rashid Sunyaev (right) and Bruno Rossi
at the Boston AAS meeting in January.

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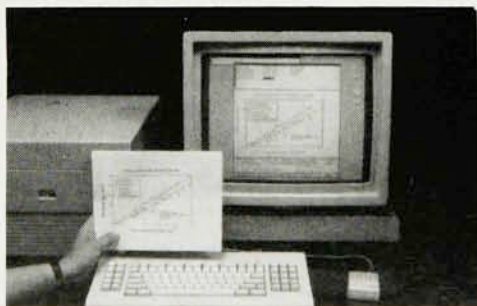


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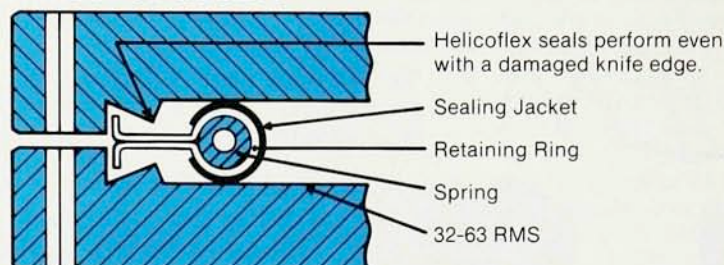
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league for 24 years until the latter's death on 2 December 1987. In 1974 Roald Sagdeev (director of IKI until 1988) invited Sunyaev and Zel'dovich to organize a theoretical group within IKI; in 1982, Sunyaev organized the department of high-energy astrophysics at IKI.

—PHA

EWEN AND PURCELL WIN TINSLEY PRIZE

The 1988 Beatrice M. Tinsley Prize of AAS has been awarded to Harold I. Ewen and Edward M. Purcell for the first detection of the 21-cm hyperfine transition radiation of neutral hydrogen. The discovery "has had enormous impact on our understanding of the structure and dynamics of our own and other galaxies and the interstellar medium," according to James Gunn, chairman of the prize committee. The prize, first presented two years ago to Jocelyn Bell Burnell for the discovery of pulsars, honors astronomical or astrophysical research of an exceptionally creative or innovative character.

Ewen and Purcell mounted a horn antenna built of plywood and copper foil outside an upper story of the Lyman Laboratory at Harvard University. They used a "switched-frequency" method of signal detection: to improve sensitivity, a double superheterodyne receiver with 17-kHz passband was switched 30 times a second back and forth between two reference frequencies 75 kHz apart. On 25 March 1951, during a scan of the sky by Earth rotation lasting a few hours, the fixed horn antenna detected an emission line (with 80-kHz width and 25 K peak temperature above the background) at a wavelength of 21 cm.

Ewen and Purcell provided details of their detection method to groups in the Netherlands and in Australia, who confirmed their discovery in May and in July 1951, respectively. The reports of discovery and confirmation were published in a single issue of *Nature*.

The discovery had been anticipated in 1945, when Hendrik van de Hulst, then a graduate student, was encouraged by Jan Oort to make a theoretical study of the feasibility of detecting spectral lines of neutral hydrogen in the Galaxy. Van de Hulst predicted that neutral hydrogen should have a hyperfine transition at a wavelength of 21 cm. In 1949 Iosif Shklovskii confirmed van de Hulst's theoretical prediction; his paper, translated from the Russian by Purcell's wife Beth, stimulated Ewen and Purcell to make a search for the line.



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