DOE HONORS SETLOW AND WEISSKOPF WITH FERMI AWARD

DOE has presented its 1988 Enrico Fermi Award to two physicists, Richard B. Setlow (Brookhaven National Lab) and Victor F. Weisskopf (MIT). The award, meant to recognize achievements in the development, use, or control of atomic energy, carries an honorarium of $100 000 to each recipient.

Setlow is cited for "his pioneering and far-reaching contributions to the fields of radiation biophysics and molecular biology, beginning with the discovery and conceptualization of the processes of DNA repair that have had an impact on research in genetics, recombination, mutation and carinogenesis."

In the early 1960s, Setlow and coworkers at Oak Ridge National Laboratory discovered the processes by which cells repair structural defects in their DNA molecules. Setlow first demonstrated that particular DNA defects induced by ultraviolet light cause biological damage; he then showed that certain enzymes in a normal cell could excise the defects. His discovery prompted an explosion of research in DNA repair, which uncovered other repair mechanisms, some occuring in humans, and it was found that certain genetic diseases are the result of inherited deficiencies in DNA repair.

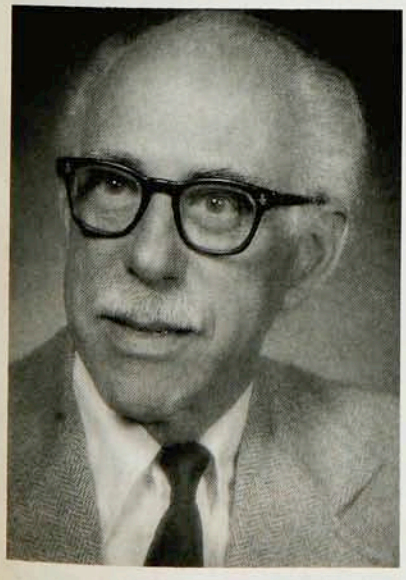
Setlow received his AB from Swarthmore College in 1941 and his PhD in physics from Yale in 1947. He was a faculty member in the physics department at Yale for 20 years and in 1961 began work in the biology division at Oak Ridge. In 1979 he became chairman of the biology department at Brookhaven National Laboratory, and since 1986 he has been the laboratory's associate director for life sciences.

Weisskopf's award cites his "many unique contributions to particle and nuclear physics, and to physics in general as a researcher, educator, and statesman of science."

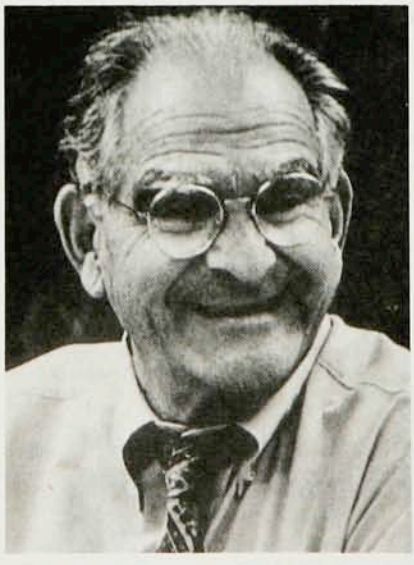
In his earliest work (1931), Weisskopf and E. P. Wigner showed, using the new field theory, that the width of an atomic emission line is equal to the sum of the widths of the initial and final states of the atom. Later, Weisskopf investigated the self-energy of the electron. He and Wendell Furry found that virtual electron-pair creation near the electron has an important effect on the electron's self-energy. Their calculations resulted in a much slower-diverging infinity for the self-energy for the electron than had been previously known. In 1934, Weisskopf and Wolfgang Pauli produced a consistent quantum theory of bosons, and later, in collaboration with Kenneth Johnson, Robert Jaffe and others in their group at MIT, Weisskopf helped to develop the model that characterizes hadrons as "bags" of quarks. Weisskopf and Herman Feshbach refined the theory of nuclear reactions by introducing the optical model, in which the nucleus is taken to act as a refracting and partially absorbing sphere.

Weisskopf received his PhD in physics from the University of Göttingen in 1931. He spent several years doing research in Europe, and in 1937 came to the US to join the faculty at the University of Rochester. In 1943 he joined the Manhattan Project at Los Alamos, where he was group leader and associate head of the theory division. In 1944 he helped to found the Federation of Atomic Scientists, which warned the public of the consequences of nuclear war and supported peaceful uses of atomic energy. In 1945, Weisskopf became a physics professor at MIT. In 1949, he joined the emergency committee of scientists, which fought for control of atomic weapons and an East–West understanding concerning atomic energy. In 1961, on a four-year leave of

Richard B. Setlow



Victor F. Weisskopf



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 SN 1987a 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.