James E. McDonald FREE

Physics Today **24** (9), 71 (1971);
https://doi.org/10.1063/1.3022955

a course in environmental physics in which he taught business majors to think quantitatively about energy sources, pollution, rapid transit and ecology. He also created a course in the "physics of seeing." He felt it a moral obligation of the university to interact with the surrounding community, and established a weekend program whereby black high-school students learned the physics of radios while building them. A true humanitarian and active anti-militarist, he terminated his Department of Defense grants a year ago.

JENSEN

Tony Jensen had the gift of making science a human and exciting experience. He will be easy to remember.

A. J. Heeger, J. A. Cohen,
P. M. Chaikin
University of Pennsylvania

James E. McDonald

A senior physicist at the University of Arizona's Institute of Atmospheric Physics, James E. McDonald, died on 13 June.

McDonald, who was 51 years old and held degrees in chemistry and meteorology as well as in physics, was a specialist in cloud physics and had also contributed to weather-modification research. A member of the National Academy of Sciences, he was a proponent of the possibility that unidentified flying objects might be controlled from beyond the earth. In July 1968 McDonald tried to convince the House Committee on Space and Astronautics that a serious study of "flying saucers" should be conducted. He accused the Air Force, which had commissioned a study of UFO's, of being "blissfully unaware" of the seriousness of the situation, and he later challenged the Air Force's Condon Report, in which most UFO sightings were linked to satellites, weather balloons, clouds, birds and other explainable phenomena.

At a private hearing of the Department of Transportation last year and again this year at a House Appropriations Committee hearing, he testified that a full fleet of supersonic transport planes would reduce the protective layer of ozone in the atmosphere that screens out some of the harmful ultraviolet rays of the sun. Although some members of the House Committee doubted his report, a National Cancer Institute specialist later concurred with McDonald, saying that McDonald's estimate of the impact of supersonic planes on skin cancer was, if anything, too modest.

Igor Tamm

Igor Tamm, head of the theoretical department of the P. N. Lebedev Physical Institute in Moscow, USSR and winner of the 1958 Nobel Prize for Physics, died on 12 April at the age of 75.

Among Tamm's many important contributions to theoretical physics was the theory of light scattering in crystals, which first demonstrated the fruitfulness of the conception of sound quanta (or "phonons," a term suggested by Tamm's friend and colleague Jacob Frenkel). In 1930 Tamm also proposed the theory of light scattering by free electrons in which he was the first to obtain rigorously the Klein-Nishina formula. He further showed that the scattering of even very soft quanta cannot be calculated correctly if Dirac's negative-energy states of the electron are neglected. And Tamm's work on the photoeffect of metals, formulated with Shubin in 1931, remains a basic theory even today.

Another of Tamm's important contributions was the theory of "Tamm's levels" of electrons in solid-state physics. He found that the particles in the Tamm levels are bound to the surface of the body and can move only along the surface. Explanation of various surface and contact properties of solid bodies is impossible without taking the Tamm states into account.

In the late 1950's Tamm performed what is perhaps considered to be his most important work when, together with Ilya Frank, he formulated a theory of the Cerenkov effect, discovered by Pavel Cerenkov in 1934.

Tamm made further advancements in physics with his prediction of the existence of the magnetic moment of neutrons and the correct prediction of its sign and his theory of controlled thermonuclear reactions, formulated with Andrei Sakharov.

In many cases Tamm's work led others to further important theoretical developments. The best example is his beta-theory of nuclear forces (1934)