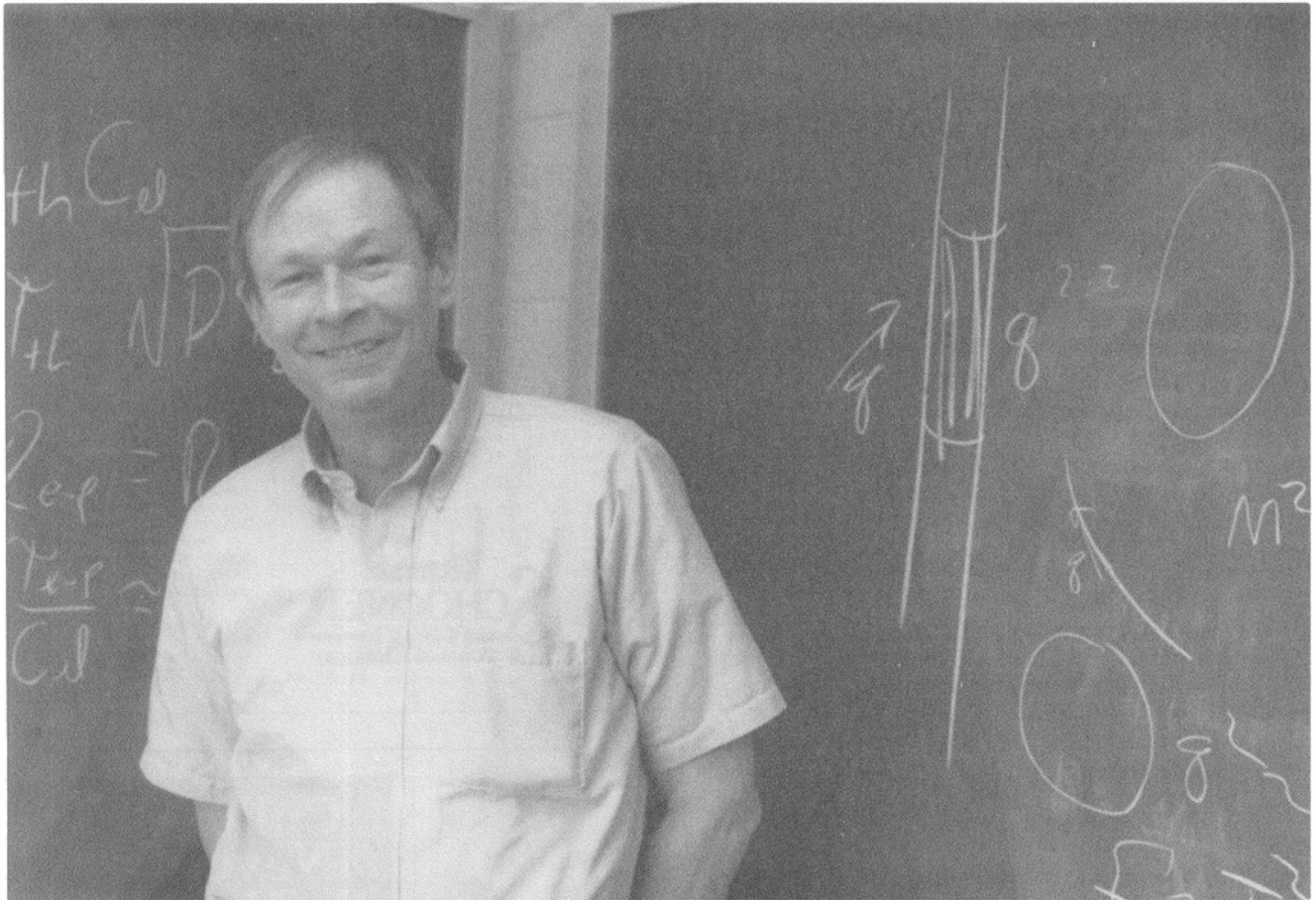


THE FACULTY



LAURIE SIEVERTS SNYDER '82

Record Temperatures

In the basement of Clark Hall, just down a piece from where physicists are searching for higher temperature superconductors (see "The Science of Superconductors," February 1988 issue), Prof. Robert Richardson, physics, is looking into what might be thought of as the Big Chill.

The rooms of the newly completed Microkelvin Laboratory are lined with butcher block wood and galvanized electromagnetic shielding. Here, Richardson and his colleagues run pilot tests in their studies to create temperatures lower than ever achieved by humans—as close to absolute zero as they can possibly get.

Absolute zero is very cold. On

the Celsius scale, it is minus 273 degrees, colder even than the coldest temperature in deep space. Scientists measure these temperatures on the Kelvin scale, which has degrees of the same "width" as the Celsius scale, but which uses absolute zero rather than the freezing point of water as its zero point. Thus, the freezing point of water is 273K.

At absolute zero, all form of heat energy is absent. Low-temperature science looks into how this absence of energy affects the behavior of certain matter when placed in such an environment.

Richardson explains: "The third law of thermodynamics predicts that as temperature approaches zero, matter will attempt to achieve a state

▲ *Prof. Robert Richardson and some of the formulas that explain his work at record low temperatures.*

of perfect order. The interesting part of low-temperature science has been discovering the details of how matter reorganizes itself to achieve perfect order."

An example of this near-perfect order was found in superconducting materials. When discovered by Kamerlingh-Onnes of the Netherlands near the beginning of this century, he had theorized that electrical resistance would decrease as the temperature was decreased. But instead of seeing a steady decrease in resistance, he found a temperature at which the electrical resistance dropped by a factor of more than a million. "We now know that the metal in such a state is a perfect conductor," said Richardson.

Achieving these low temperatures is no easy feat. The lowest temperature ever attained was 12 millionths of a degree Kelvin by scientists in Great Britain and Japan. But with the new laboratory in Clark in full operating order, scientists have a tool with which to study the properties of matter yet unknown. Says Richardson, "We think we can take it down to between 1 and 10 microkelvin (millionths of a Kelvin)." The Microkelvin Laboratory is the only one of its kind in the country, although one is under construction at the University of Florida.

"Most of the materials we wish to investigate, such as silicon, thin films of materials, or crystals of solid helium, will be cooled 100 to 1,000 times lower than in any previous work," says Richardson. "We can never be sure what will be found. Maybe we'll have the good fortune to stumble upon a new science."

Lowi Honored

Theodore J. Lowi, the Senior professor of American institutions, is a gold medal winner in the national professor-of-the-year program sponsored by the Council for the Advancement and Support of Education. He has held the chair since 1972. A survey of members of the American Political Science Association named him the political scientist who made the most significant con-

tribution to the field during the 1970s.

Cook to Leave

Robert E. Cook, director of Cornell Plantations for the past five years, is leaving to become the Arnold professor and director of the Arnold Arboretum in Boston. The appointment is by Harvard University, Cook's alma mater. A search is under way for his successor at Plantations.

Four Professors

Henry G. Booker, a former director of Electrical Engineering and associate director of the Center for Radiophysics and Space Research, died November 1, 1988, in La Jolla, California, at age 77. He was a faculty member from 1948-65, a designer of the radio telescope at Arecibo, Puerto Rico.

Prof. Herbert F. Newhall, PhD '42, physics, died November 6, in Sayre, Pennsylvania, at the age of 72. He did research in electronics during World War II, wrote *Introductory Analytical Physics*, and taught the introductory physics course. He became an instructor in 1942, a faculty member in 1945, and retired in 1981 but continued to teach until last year.

Prof. Chandler Morse, economics, emeritus, died December 5 in Sarasota, Florida. He was an active member of the faculty from 1950 until he retired in 1971. Before coming to Cornell he served in the Federal Reserve System. Africa was the focus of his research in economic development.

Prof. Albert "Shad" Roe, history of art, emeritus, died December 19 in Ithaca at the age of 74. He joined the faculty as department chairman in 1961, and retired in 1984. His scholarship centered on William Blake and on the transfer of decorative styles from Europe to the American colonies.



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