

Kenneth I. Greisen

January 24, 1918 — March 17, 2007

Kenneth I. Greisen, Professor of Physics, Emeritus, and former Dean of the Faculty, died on March 17, 2007 at age 89, at the Hospicare of Ithaca residence.

Ken was born in Perth Amboy, New Jersey, January 24, 1918. After graduation from Franklin & Marshall College in 1938, he came to Cornell for graduate work in physics, completing his Ph.D. degree in 1942, working with Professor Bruno Rossi. A 1941 article in *Reviews of Modern Physics* by Greisen and Rossi entitled, “Cosmic Ray Theory,” became a standard reference in the field.

In 1943, with his new wife, Betty, he joined the large team of physicists working for the Manhattan Project at Los Alamos, New Mexico. He was a member of the team that worked on the detonation system for the first atomic bomb. After observing the “Trinity” test in 1945, he wrote an eye-witness report that has become part of the historical record of that event. His immediate comment: “My God, it worked!” provides a pungent summary of this watershed event in human history.

His two children, Eric (1944) and Kathryn (1946), were born in Los Alamos.

Ken returned to Cornell in 1946 as Assistant Professor of Physics. Thus came the beginning of a long and distinguished career as research physicist, physics teacher and mentor, and University leader, prior to his move to Emeritus status in 1984.

Ken was mentor and colleague to 21 physics Ph.D. students, six post-docs and many undergraduate physics major students. Ken’s relationship to his students and research associates was based on mutual respect, caring, and encouragement. His students remember his brilliance as well as his generosity, great patience, and unfailingly calm demeanor. He taught them to have confidence in themselves. Always practical, he saw to it that they had sufficient financial support. At a time when very few women attempted careers in physics, Ken was exceptionally encouraging to those whose lives he touched.

Greisen’s physics research activities centered in a deep and extended study of cosmic rays—those high energy particles and radiation that come to the Earth from outer space—and the showers of secondary particles produced in the atmosphere by the incident cosmic rays. With his collaborators, he installed arrays of cosmic ray activated scintillators on top of Cornell buildings, as well as 600 m below ground in salt mines near Ithaca. The data from

these detectors gave information about intensity, particle composition, and direction of the cosmic rays and their secondary air showers.

In the 1960s, he and his students and research associates installed an array of fluorescence detectors on the hills around Ithaca to study the extensive but rare showers of particles that are initiated by incoming cosmic “rays” with very high energies. Descended from this initial, so-called “fly’s eye” configuration of detectors, were more fully developed systems at the University of Utah in the 1970s, and a present day, large-scale international project located in the Andes mountains in Argentina, known as the “AUGER” experiment.

Remarkably, his contributions to the study of cosmic rays continue to influence contemporary research activities. In 1966, Greisen had postulated that cosmic rays from distant sources could not reach the Earth if their energies were above a certain limit. He realized that such particles, over their long paths, would lose their excess energy via interaction with the background microwave radiation that fills all of space. Two Russian scientists, Kuzmin and Zatsepin, made the same prediction independently, and the postulated energy limit of about 6×10^{19} eV became known as the “GZK Limit.” In a striking near-coincidence with Ken’s death in March 2007, the physics journal, *Physics Today*, reported strong evidence, collected by the HiRes research group at Utah, for suppression of cosmic-ray intensity above the GZK limit.

Growing out of the strong interactions of his research group with nearby activities in the Department of Astronomy and Space Sciences, he served as Chair of that department from 1976-79.

Following his personal role in helping to form a High Energy Astrophysics Division of the American Astronomical Society in the early 1970s, Ken served as the first chair of that Division. He was elected to the National Academy of Sciences in 1974.

Ken was a strong participant in efforts to improve the effectiveness of physics education at Cornell and elsewhere. Along with Philip Morrison and Hans Bethe from Cornell, he participated in the work of the Physical Science Study Committee in the late 1950s. Their work, based at the Massachusetts Institute of Technology, instigated a major review of the content of high school science courses in the U.S. He served for a period of years as chair of the major advisors group of the Physics faculty, as well as himself acting as major advisor to numbers of physics major students in the College of Arts and Sciences. A number of these major students participated in his cosmic ray research program.

In the late 1960s, Ken acted as leader of a team comprising faculty and graduate students from the Physics and Science Education Departments that engineered a complete redesign of one of the introductory physics courses at Cornell—that teaching pattern has continued to this day in 2007.

Beyond his physics research and teaching activities, Ken made significant contributions to the wider university life. He served as University Ombudsman, 1975-77. His service to the University community culminated in his leadership as Dean of the University Faculty from 1978-83.

Ken's wife Betty died in 1976. His equally happy second marriage, to Helen Wiltberger, ended with her death in 2007.

Ken greatly enjoyed the outdoors and music. Golf and canoeing were favorite recreations. He played the flute for his own pleasure, and joined several Ithaca singing groups—successively the Unitarian Church choir, the Ithaca Community Chorus in its early days, and the Presbyterian Church choir. Following his retirement in 1986, his persistent concern for the welfare of others led him to volunteer work with various Ithaca organizations that served people in the community who were marginalized by age or economic circumstance.

In the wake of Ken's death, Saul Teukolsky, a Cornell colleague and present chair of the Physics Department, responded,

“Ken was a wonderful, gentle person. It's no wonder he was so successful as University Ombudsman. Yet, at the same time, he was at the top of the field of cosmic ray physics, and the field today continues to be shaped by his work.”

Kenneth Greisen leaves a remarkable legacy.

Donald F. Holcomb, Chair; David G. Cassel, Edith Cassel