Geoffrey V. Chester died in Ithaca after a brief illness. Born in Totley, Derbyshire, England in 1928, he was six years old when his family moved to Edinburgh, Scotland. There he attended Daniel Stewart's College and graduated in 1950 from Edinburgh University, where he studied with and admired Max Born. When people referred to Geoffrey as English, as they often did, he would correct them: “Scottish.”

He received his Ph.D. in physics in 1954 from Kings College, London. In his thesis he acknowledges C. A. Coulson and H. C. Longuet-Higgins. He then came to the United States for postdoctoral work with Lars Onsager at Yale University and with Joseph Mayer at the University of Chicago. From 1957 to 1964 he was a member of Rudolph Peierls' renowned Department of Mathematical Physics at the University of Birmingham, England.

Geoffrey joined the faculty at Cornell in 1964, where he played a major role in the construction and leadership of the Cornell condensed-matter theory group, which attracted extraordinary
graduate students, postdoctoral fellows, and faculty visitors from all over the world. He served as Director of Cornell’s Laboratory of Atomic and Solid State Physics from 1968 to 1974, Associate Dean of Cornell's College of Arts and Sciences from 1978 to 1986, and Dean from 1986 to 1991. He retired in 1995, but maintained a lively and insightful interest in all aspects of physics and life up to his final week.

In the field of low temperature physics Geoffrey Chester has long been known for two theoretical predictions:

In 1955 he predicted that “we should expect a phase separation of the isotopes” in mixtures of liquid helium-3 and helium-4. Atoms of the two helium isotopes differ only inside their tiny nuclei: the common isotope helium-4 has two protons and two neutrons, while the rare isotope helium-3 has two protons but only a single neutron. Both helium isotopes liquefy only at a few degrees above absolute zero. According to classical (pre-quantum) physics the only consequence of the difference in their atomic nuclei should be a slightly greater gravitationally induced compression of the heavier liquid. If equal quantities of the two isotopes are stirred together in the liquid state, classical physics requires them to remain completely mixed when the stirring stops. Quantum physics, however, predicts that the missing neutron leads to profound differences in the two helium liquids and, as Chester [1955] showed, under appropriate conditions the two liquids should actually separate from one another, just as oil and vinegar do. This phase separation was observed in the laboratory the following year. Today it is now exploited in commercially available “dilution refrigerators” to reach temperatures a thousandth of a degree above absolute zero.

And in 1970 he made a surprising theoretical discovery about the solid form of pure helium-4. The liquid form of helium-4 had been found in the late 1930s to exhibit some very strange “superfluid” behavior. Superfluids can flow frictionlessly through passages so constricted that they completely block the passage of an ordinary liquid. And when a vessel containing superfluid helium-4 is slowly rotated, the liquid refuses to participate fully in the motion; the motion of the walls is unable to communicate itself to the entire
fluid enclosed by those walls. It was soon realized that superfluidity was associated with a phenomenon predicted theoretically in the mid-1920s, named (after its discoverers) Bose-Einstein condensation. Chester [1970] points out that it is possible for helium-4 near absolute zero to undergo Bose-Einstein condensation, while, at the same time, taking on not the uniform spatial density characteristic of the liquid state, but the periodic spatial variation of the density characteristic of the orderly crystalline arrangement of atoms in solid helium-4. This work launched the theoretical and experimental study of “supersolids,” an endeavor that remains active and controversial to this day.

Starting in the late 1970s, Geoffrey was among the first physicists to use extensive computation as a crucial component of rigorous theoretical analysis, in the spirit of Richard Hamming’s injunction that “The purpose of computation is insight, not numbers.” This work, done in collaboration with postdocs and graduate students both at Cornell, and with the group associated with one of us (Kalos) at the Courant Institute at New York University, led both to scientific knowledge of the systems studied, and to important advances in computational methodology.

The group investigated dense collections of many individual particles, ranging from liquid and solid helium-4, to models of enormous atomic nuclei (“nuclear matter”). Quantum physics is essential in accounting for the behavior of such systems. But numerical computations of large quantum systems face a seemingly insuperable barrier. The numerical computations needed to make accurate quantitative predictions rapidly become inefficient as the number of particles increases. What saves the day are “Monte Carlo” computations. These deliberately inject randomness into the numerical procedure. Geoffrey and his collaborators developed and exploited significant advances in the application of Monte Carlo methods to quantum systems, finding a method for calculating directly from the known interactions among a few atoms, the properties of large numbers of helium-4 atoms in both the liquid and the solid state. The errors in these computations can be reliably estimated, and are small. They also studied large collections of neutrons, and of neutrons and protons, and their numerical results
for Hans Bethe’s famous “Homework Problems” in models of neutron and nuclear matter were widely influential. Geoffrey’s deep grasp of the underlying physics led to an understanding of what systems to study, and what questions to ask of the computations.

Instrumental in these successes were his love of physics, his integrity, and his warm encouragement of young people. His special gift was being able to picture the quantum phenomena before starting any calculations. His profound intuition was the key to the success of his theoretical constructions.

Several years before the advent of personal computers and text-editing programs, Geoffrey’s expertise in computational physics led him as Associate Dean, to introduce computers to humanists as surprisingly valuable aides in preparing manuscripts. As Dean he came to know the College of Arts and Sciences in every detail. His accomplishments included innovative and vigorous recruitment of women and minority faculty, and far-sighted long-term planning.

Geoffrey was a long-time assistant to, and collaborator with his wife, the ceramist Carolyn Chester. He built many of the wooden structures and frames for her ceramic sculptures, and introduced her to chemicals not ordinarily used in ceramics.

His family, friends, colleagues, and neighbors remember him as a modest, kind, and deeply ethical person, who possessed a ready and playful sense of humor and a tremendous curiosity about almost everything he came across. He had many interests and pursuits and enjoyed talking with anyone who shared them: bread-baking, woodworking, art-book collecting. He loved the western islands and highlands of Scotland, and delighted in the wild turkeys that paraded across the family's backyard in Ithaca.

Geoffrey is survived by his wife, Carolyn; his children, Michael, Nicholas, and Sarah; and by his sister and brother-in-law, Dorothy and Gerald Grainger of Dunkeld, Scotland. He will be very much missed by them as well as by his friends, neighbors, and colleagues from his rich academic life.