

***In Memoriam***  
**Nancy Knight**  
**(1922 - 2011)**

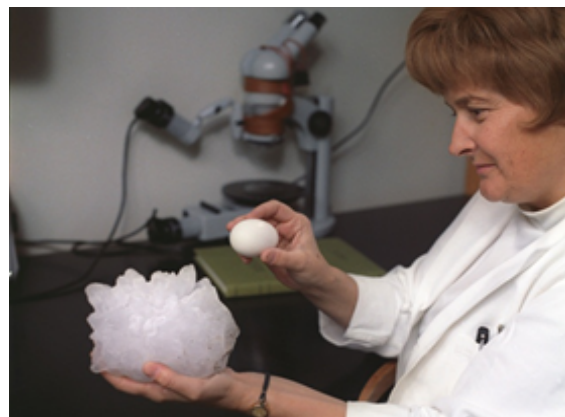
Nancy Chase Knight (1922-2011) was born in Boston. Although she attended Wellesley College, most of the knowledge gained during her 49-year career in the atmospheric sciences was accomplished through learning on the job. She took great pride in her lack of formal education.

Nancy's introduction to atmospheric science - and to her future husband, Charlie - resulted from an invitation to apply for a job at the then Department of Meteorology at the University of Washington. While there, Nancy worked for Project Husky, taking observations of the Arctic from encampments on the ice, and she eventually became assistant director. She and Charlie were married in Big Bend, Texas, in 1962, after which they moved to Colorado. They soon joined the National Center for Atmospheric Research (NCAR); there they learned that money was available through the U.S.-Japan Scientific Cooperation Committee to support scientists to make extended visits to Japan. Charlie welcomed the opportunity to visit the University of Hokkaido in Sapporo. While he worked on ice crystals, Nancy taught conversational English to faculty, people in the community, and children, and also helped professors write their papers in English.

By the time they returned to the United States in 1965, discussions of an American hail-modification research program were gaining momentum. A delegation of Americans visiting the Soviet Union had been led to believe that the Soviets had succeeded in suppressing hail; it was important to verify these results, and if valid, to replicate and even improve on their success. Even though there was little enthusiasm for the project, NCAR and the Knights became quickly involved in a series of hail experiments: Project Hailswath (1966), the North-east

Colorado Hail Experiment (1969-70), and the National Hail Research Experiment (NHRE; 1971-76). With Charlie's interest in ice, hail was a natural topic to pursue.

Nancy's work evolved into hailstone collection and analysis, first with Charlie and then independently. She participated in many hail and hail suppression research projects into the 1990s, both chasing storms to collect hailstones in real- or near-real time and collecting hail from farmers and ranchers afterward. Once back in the laboratory, Nancy would slice the stones into thin-sections and take photographs in both natural and cross-polarized light to highlight the crystal structure. These studies took her not only to northeast Colorado, but also to South Dakota, Montana, Oklahoma, North Dakota, Alberta, Bulgaria, Italy, Switzerland, and South Africa. It was often a challenge, particularly overseas, to find a cold room appropriate for storing and analyzing the hailstones she collected; often Nancy shared space with vegetables, ice cream, and dead animals.



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During the 1960s and 1970s, Nancy assisted Charlie on several studies of hail behavior as revealed from the stones collected; studies dealt with hail embryos, conical graupel, spongy hail, and the origin of hailstone lobes. Each of these papers represented analysis of hundreds

of hailstones, from many different storms, necessary to make reasonable conclusions.

By the late 1970s, Nancy was writing some articles as lead author, building on the previous papers with Charlie as well as statistics on an ever larger collection of hailstones. She synthesized data from previously collected hailstones from many parts of the world in a climatology of hail embryos (1983). It shows some tantalizing relationships between embryo type (frozen drop vs. graupel) and hailstone size or cloud-base temperature (in an average sense). She nonetheless concluded, in the careful style which characterized the earlier papers, that firm generalizations are hard to come by and the only firm-but-important conclusion was that one hail-suppression strategy cannot be applied to all regions.

In the late 1980s, Nancy started working on cirrus ice crystals as well as hail. Her primary duty was to photograph samples collected from aircraft in a preserving material, an effort that took her to Wisconsin, Kansas, and the Pacific (TOGA COARE and CEPEX). She also collaborated with Harry Orville on two NSF-sponsored Research Experiences for Undergraduates projects associated with major convective-storm field projects conducted in Bismarck, ND, in 1989 and 1993 to study the potential for hail damage mitigation using cloud seeding.

Nancy was a mentor to many younger scientists and an inspiration to women at NCAR and elsewhere. She taught by example a healthy skepticism, and shared her passions with those she inspired. Nancy had many passions; she loved the sea and sailing before moving to inland Boulder. Her love of birds and the ocean led to the purchase of a second house in the prime birding territory of Padre Island, Texas. She loved small dogs, fine food, wine and Armagnac and was an outstanding cook.

Nancy read voraciously and loved a good turn of phrase. She had a collection of stories and sayings, one of the most memorable being: "I change my mind often because I keep it clean that way." Nancy would also lend her blue pencil to both Japanese and American scientists in need of editing help, something she kept up to the end of her career.

Her character is best painted in bright colors rather than pastels. She was certainly one of the most colorful figures in the weather modification field. Many participants in field projects will recall her "holding court" at a group dinner session after a long day in the field, recounting tales of her many adventures. When she was present, meals were often rapid-fire exchanges punctuated by gales of laughter when Nancy drove a point to its target. Those who knew Nancy can quickly summon up a story on her driving habits (sudden stops for an interesting bird; driving at speeds associated more with catching up with storms than with road conditions or speed limits and the resulting exchanges with the Highway Patrol) or her dislike of flying.

That she commanded respect is illustrated by a story Charlie tells. During NHRE, Ron Rinehart asked all the participants to estimate the height of their colleagues and compared the estimates to their actual height. Nancy's estimated height was much greater than her actual height - a tribute to her stature in the eyes of her friends and colleagues.

*Based on the BAMS obituary by Peggy Lemone and colleagues.*