

and exemplary behavior as a boss and colleague. He was outspoken and often disarmingly quick witted, and could lash out against stubborn bureaucrats, dishonest people, or obsessed ideologists—whether they were colleagues, high-ranking politicians, superiors, or employees who reported to him. To those whom he opened his heart, he was a most enriching, stimulating, and caring friend.

His colleagues at the University of Konstanz feel privileged to have known Bömmel and are most grateful for his kind and exemplary leadership and keep fond memories of this great man.

Ernst Bucher

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Clifford V. Heer

Clifford V. Heer, a noted researcher in low-temperature, statistical, and laser physics, died 8 July 2004 in Columbus, Ohio, of complications from Parkinson's disease.

Heer was born 31 May 1920 in Burlington, Ohio. He received a BSc in engineering physics at Ohio State University in 1942. From 1942 to 1946, he served as a lieutenant in a radar unit with the US Army Signal Corps in the South Pacific. He returned to OSU and presented his PhD thesis, "Some Properties of Superconductors Below 1 K" in 1949, under the supervision of John Daunt. Heer became an assistant professor in OSU's department of physics and astronomy in 1949, a full professor in 1961, and retired as professor emeritus in 1990.

Heer's early research was in low-temperature physics, a field in which he made several outstanding contributions. In 1949, he and Daunt were the first to describe what is now called

a superconducting thermal switch, which uses the increase in thermal conductivity when a superconducting metal is made normal by a magnetic field. Their proposal was based on their own measurements on titanium below 1 K. They proposed using such switches in a cyclic magnetic refrigerator. Heer and Daunt also made notable advances in the study of mixtures of liquid helium-3 with helium-4. What is now known as the Heer–Daunt model shows that many thermodynamic properties of liquid mixtures closely resemble those of coexisting Bose and Fermi ideal gases. In addition to his experiments on helium mixtures, Heer made extensive measurements of superconducting critical fields, low-temperature specific heats of metals, and magnetic susceptibilities in paramagnetic solids.

During the latter part of the 1950s, Heer's research shifted from low-temperature physics to the study of electromagnetic waves. While working as a consultant at Space Technology Laboratories Inc in Los Angeles, he proposed and carried out a measurement of absolute rotation based on the beat frequency that results from the splitting of a degenerate mode in a rotating resonant cavity. The optical detection of rotation was well known as the Sagnac effect, but Heer was the first to convert the small difference in effective path length due to rotation into the frequency domain, where it could be measured with high sensitivity and accuracy. The invention of the laser allowed such a measurement at optical wavelengths with even higher sensitivity. Such interferometers, now commonly referred to as laser gyroscopes, operate on the principle described by Heer in a patent disclosure in 1959 and discussed at an American Physical Society (APS) meeting in January 1961. (See Heer's letter to *PHYSICS TODAY*, May 1982, page 134.)

In the early 1960s, Heer suggested a method of confining particles that have a magnetic dipole moment, such as spin-polarized hydrogen or very cold neutrons, in a magnetic bottle. A decade or so of research revealed that it was possible to obtain thermal moderation of neutrons to temperatures of the order of 10^{-2} to 10^{-3} K, and Heer's method became practical.

From the 1960s into the early 1980s, Heer continued his interest in laser physics. Before the wide availability of commercial lasers, he and his students built a carbon dioxide laser and studied photon echoes in sulfur tetrafluoride and sulfur hexafluoride gases. Insights from those experiments led to the study of electron-beam



Clifford V. Heer



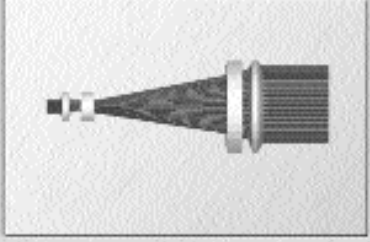
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pumped superradiance in nitrogen, and from there to the fabrication of nitrogen-laser pumped dye lasers, instruments that enabled Heer's group to examine coherent phenomena in atomic sodium vapor. He predicted, and later confirmed experimentally, unique focusing properties of photon echoes in that system.

Heer was keenly interested in the relatively new field of nonlinear optics, and he and his students applied their experience with sodium vapor to studying sum-frequency generation in that material, using simultaneous pumping with two dye lasers and making use of the sharp atomic resonance lines to enhance the optical nonlinearity. Combining that nonlinear effect with coherence effects, Heer's group then studied the optical properties of photon echoes that have been stimulated by three frequencies.

Heer also made significant theoretical contributions to other fields of physics, including the localization of orthopositronium in gases and the effect of weak neutral currents on cosmic hydroxyl.

Among Heer's published works are the textbook *Statistical Mechanics, Kinetic Theory and Stochastic Processes* (Academic Press, 1972), several laboratory manuals, and numerous publications on low-temperature physics, atomic and laser physics, general relativity, and statistical physics. He was a consultant for TRW Inc, Space Technology Laboratories, and Honeywell, and a technical consultant for the US Justice Department. In 1990, the Ohio section of APS honored him with the William Fowler Award.

Colleagues remember Heer with affection. Among the OSU physics faculty, he was known as a man of principle who did not hesitate to express his candid opinion when necessary. Sometimes his was the only dissenting vote in faculty meetings when a decision more convenient than honorable was being considered.

His interests outside of the university involved his great love of the outdoors. He led Boy Scouts on camping and canoeing trips and was an avid hiker and gardener. After retirement, he and his wife traveled extensively in South America, Australia, New Zealand, Egypt, and Turkey.

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Janet Akyüz Mattei

Janet Akyüz Mattei, director of the American Association of Variable Star Observers (AAVSO) for more than 30 years, died on 22 March 2004 in Boston after a valiant battle against acute myelogenous leukemia. Her passing generated an outpouring of remembrances of Janet from professional and amateur astronomers around the world.

Born Janet Hanula Akyüz on 2 January 1943, in Bodrum, Turkey, she was the eldest of five children. She came to the US in 1962 to attend Brandeis University, where she received a BA in general science in 1965. Janet returned to Brandeis in 1968 to spend a summer at the Maria Mitchell Observatory in a program directed for many years by Dorrit Hoffleit. That summer, she became acquainted with variable stars, the AAVSO, and her future husband, active AAVSO member and optics specialist Michael Mattei. She earned master's degrees from Ege University in Turkey (1970) and the University of Virginia in Charlottesville (1972), and subsequently took a position as assistant to the director of the AAVSO.

A year later, Janet became director of the AAVSO when the director retired. At the time, the organization occupied cramped quarters near the Harvard-Smithsonian Center for Astrophysics in Cambridge, Massachusetts. Founded in 1911 under the auspices of Harvard College Observatory, the AAVSO had become independent in 1954. During Janet's tenure, the international, nonprofit association grew from a small, history-rich but resource-poor organization that received 150 000 variable star observations annually and managed them entirely on paper to a fully modern, well-endowed organization that electronically processes 450 000 variable star observations yearly, operates the AAVSO international database, and provides real-time support to space- and ground-based observatories. Janet also oversaw the expansion of the headquarters staff and, thanks to the generosity of long-time member Clinton B. Ford, the acquisition of AAVSO's own building.

From the 1980s on, the AAVSO's traditional area of strength—observing variables over a very long timeline—was expanded under Janet's leadership through several new programs reflecting advances in the field. The first was monitoring cataclysmic variables and immediately alerting astronomers to eruptions so they could begin space- and ground-based observations. An-



Janet Akyüz Mattei

other was a program to pinpoint the sources of gamma-ray burst optical afterglows. In 1982, she earned her PhD in astronomy, under adviser Sezai Hazer, from Ege University for an analysis of long-term AAVSO data on dwarf novae.

Janet opened the door for serious amateur observers to contribute to astronomy. She recognized the value of their contributions and the effort represented by tens of thousands of observations from individual observers who worked voluntarily on their own time and equipment. She also took a personal interest in each AAVSO member and observer. In a 2003 radio interview with amateur astronomer David H. Levy, taped shortly before she was diagnosed with her final illness, she said that when she saw an observation and the observer's initials attached, she could picture that person at a telescope making the observation.

Education, especially of young people, was a passion of Janet's. A number of professional astronomers began their careers at the AAVSO or were mentored by Janet. She codeveloped a successful curriculum to teach the scientific learning process and mathematics through variable star observing and was active in United Nations international astronomy education programs.

Janet's enthusiasm for nature extended beyond astronomy to include flowers, particularly wildflowers, and at meetings people would vie for the opportunity to show her a new one. She delighted attendees at one AAVSO general meeting with a computer slide presentation featuring flowers that faded into astronomical objects with similar form and color. Her office was bright with a mixture of flower photos, astronomical photos,