

IN MEMORIAM

WILLIAM E. DRUMMOND

William E. "Bill" Drummond was born on September 18, 1927, in Portland, Oregon, and passed away December 14, 2016, after a long illness.

He attended Grant High School in Portland, where he was an outstanding tennis player, ranking nationally in both singles and doubles play, an avocation he continued for many years. Following high school, Bill enrolled in Stanford University, majoring in physics. He graduated in 1950 and enlisted in the U.S. Navy. In 1953, he married Stephanie Jones of Victoria, Canada, whom he met while visiting friends in New York. They had three children.

After discharge from the Navy, Bill returned to Stanford graduate school, obtaining his Ph.D. in Physics in 1958 under the direction of Leonard I. Schiff. Upon graduation, Bill joined and eventually became Director of the Plasma Turbulence Laboratory at General Atomics, a division of General Dynamics. While there, he met and worked with Marshall Rosenbluth and David Pines. His 1961 paper on the quasi-linear theory of weak plasma turbulence with Pines was the first systematic nonlinear theory of plasma turbulence and is among the most highly cited papers in the field of plasma physics. Quasi-linear theory remains the reference standard to this day for the nonlinearly saturated state of linearly unstable plasma turbulence, a ubiquitous phenomenon in plasmas. Even where the theory does not rigorously apply and has been revised by more precise theories, quasi-linear theory remains a first estimate and common denominator for comparison.

In the early 1960s, Harold P. Hanson, Chair of the Physics Department at The University of Texas, approached Bill Drummond about establishing a plasma physics research center at the University. The Texas Atomic Energy Research Foundation (TAERF), a group of Texas investor-owned electric utilities, had been supporting fusion research at General Atomics and was interested

in supporting this research in Texas. In 1964, Bill and his family moved to Austin. The first product of this effort at the University with TAERF support was the construction of a collision-less shock experiment directed by A. E. Robson from Culham Laboratory. Bill's leadership was responsible for the administration's support for building a world-class plasma program at UT Austin. This led to founding of the Fusion Research Center (FRC) together with the creation of new faculty positions in the plasma physics area that enabled Bill to recruit bright young creative plasma physicists who, over the years, have made breakthrough contributions to the plasma field. Bill, this core faculty, along with other UT Austin researchers were able to make the FRC one of the world's premier fusion and plasma physics centers with the largest academic group in any physics department in the nation. His energetic leadership further persuaded the University to add a large new laboratory to the Robert Lee Moore building during its construction phase. The new facility became the home of the first major academic fusion experiment, the Texas Turbulent Tokamak (TTT). The space set aside for TTT would be used, over the next fifty years for the construction of large new plasma physics experiments on the UT campus.

As TTT was completing its experimental program, Bill spurred the effort to convince the Department of Energy to build a new device, which was named the Texas Experimental Tokamak (TEXT). Its goal was to understand the physics phenomena in fusion plasmas, a purpose often neglected at other larger laboratory sites where setting plasma confinement records was the typical priority, often to the neglect of understanding new phenomena that were being encountered. The TEXT facility attracted plasma physicists from labs throughout the world to visit and collaborate with UT Austin researchers in developing and exploiting new measurement techniques and in studying fundamental plasma edge behavior.

As TEXT construction was finishing around 1980, the Department of Energy decided to fund a major new academic center for basic fusion theory. Bill spearheaded the successful proposal, which recruited Marshall Rosenbluth as the first director of the Institute for Fusion Studies (IFS). The IFS soon became an internationally recognized leader in fusion theory and the largest university fusion theory group in the world. To this day the IFS continues to contribute to new theoretical concepts and experimental interpretations, and to produce a steady stream of newly trained Ph.D. plasma physicists.

In addition to his professorial responsibilities, Bill also established a plasma physics related research company, Austin Research Associates (ARA). He employed a number of very bright young physicists and programmers who were early investigators of the use of large amplitude plasma waves in electron-beams to accelerate ions to high energies with table-top devices.

Throughout his career, Bill was recognized as one of the world's premier theoretical plasma physicists and a leading authority in the field of non-linear plasma dynamics, plasma turbulence, and plasma radiation. He was a United States delegate to the first International Conference on Plasma Physics and Controlled Thermonuclear Fusion in Salzburg in 1961, an historic event at which every nation working on fusion weapons (H-bombs) agreed to declassify magnetic fusion research and share its results, and the Second International Conference at Culham, England in 1965. He was a member of the first international faculty of the Seminar on Plasma Physics at the International Institute for Theoretical Physics in Trieste in 1964 and a member of the plasma physics panel of the National Academy of Sciences. He held the TAEFR Professorship from its establishment in 1983 until he retired.

Beyond his accomplishments in theoretical plasma physics, Bill possessed a unique breadth of vision and combination of talents. He recognized that plasma physics required both theory and

experiment; he chose the best people for the tasks, and then set them to work freely without his interference. He was a skillful leader, adept at convincing both Members of Congress and physicists of the importance of his goals. He was also as entertaining a raconteur giving after-dinner speeches as he was effective as a physics lecturer.

In addition to his professional physics interests, Bill continued to be active in sports competition throughout his life. Along with tennis, Bill was active in competitive sailing, which he started while he was with General Atomics in San Diego. Bill also began racing small sailboats, a sport he continued in Austin as an enthusiastic and highly competitive helmsman, and he became a founding member of the Austin Yacht Club.



Gregory L. Fenves, President
The University of Texas at Austin



Alan W. Friedman, Secretary
The General Faculty

This memorial resolution was prepared by a special committee consisting of Professors Kenneth Gentle (chair), Herbert Berk, and Melvin Oakes.