



Greg Dash (1923-2010)

Our dear friend and colleague, J. Gregory Dash, passed away on Sunday, November 28, 2010. A memorial, hosted by his family, will take place at Horizon House, 900 University Street in downtown Seattle, from 1:30 pm to 3:30 pm on Sunday, December 12.

Greg earned his BS from City College, NY, in 1944. After a short time in the US Navy as a radar technician during World War II, he entered graduate school at Columbia University. He earned his PhD in Physics in 1951, working on the subject of superfluid helium. He remained interested in this topic throughout his career. After his doctorate, he joined the scientific staff of Los Alamos National Laboratory and worked there until 1960 when he took a position as Associate Professor at the University of Washington.

At Los Alamos Greg made fundamental measurements of the heat of mixing of liquid ^3He and ^4He at low temperatures. These led to the prediction of isotopic phase separation in the mixtures, a prediction later confirmed. Today phase-separated mixing chambers in dilution refrigerators have made it possible to maintain, almost indefinitely, temperatures in the millikelvin range. This has permitted fundamental measurements to be carried out in quantum fluids and solids, magnetic materials, superconductors, and dark matter. Greg was measuring recoilless absorption of gamma rays, an unexpected phenomena, when Rudolf Mössbauer announced his discovery of the same effect, one for which he was awarded the Nobel Prize. Greg's group was the first to confirm the phenomena. He was elected Fellow of the American Physical Society in 1957, at age 34, and was awarded a Guggenheim Fellowship to Cambridge University for 1957-58, all before he came to Seattle. He and Joan, his wife of 65 years, remembered this time in Cambridge as a highlight of their life.

Greg's impact in shaping Condensed Matter Physics at the University of Washington was immense. He was the first full-time physicist in the Department in this field. He brought to

Seattle his expertise in low temperature helium physics and Mössbauer spectroscopy, and built a wonderful low temperature and Mössbauer facility. This was done with his own students and with Associate Professor Paul Higgs. He recruited Edward Stern, who started a large Solid-State Physics group, Michael McCormick, who worked in helium films and nuclear magnetic resonance, and Robert Ingalls, who took over the Mössbauer experiments. There was no Condensed Matter Theory Group; Professors Edward Uehling and Robert Puff served, part-time, in that capacity.

Greg, Ed Stern and Robert Williams wrote a proposal to the NSF, funded in 1967, for a Science Development Grant in both condensed matter and experimental particle physics. Under this grant Oscar Vilches was recruited in 1968, and Michael Schick, the Department's first full-time condensed matter theorist, in 1969. Sam Fain arrived in 1970. Henry Lubatti was recruited to start a bubble chamber group, or Visual Techniques Laboratory, as it was then called. This grew into our current Experimental Particle Physics Group.

With his students and new colleagues, developed and explored the field of Two-Dimensional Physics. He enticed Sir Rudolf Peierls to come regularly from Oxford University to the UW as a Battelle Professor and collaborate, and also began a very fruitful experimental collaboration with the groups of Professors Michel Bienfait and Jean Suzanne from the Faculté des Sciences de Luminy and their Center for the Growth of Crystalline Materials in Marseille, France. Greg's pioneering studies were recognized by the award, in 1985, of the Davison-Germer Prize of the American Physical Society. He received an honorary Doctorate from the Université d'Aix-Marseille in 1989.

As an outgrowth of his work on two-dimensional surfaces, Greg studied the way in which films do, or do not, grow into three-dimensional bulk material. His elegant experiments led to a renewed interest in wetting and related phenomena such as surface melting. In 1985 he began collaborating with UW faculty to study ice and its melting properties. In particular, Greg worked on the surface and interfacial melting of ice, often in collaboration with John Wettlaufer, then at the UW Applied Physics Laboratory and now at Yale.

Discussions among David Cobden, Greg Dash and Oscar Vilches concerning the micro-balance techniques utilized in surface adsorption led to Cobden's work using carbon nanotubes as ultra-sensitive balances. These balances consist of an oscillating, single wall, nanotube whose resonant frequency of oscillation changes upon the addition of mass. It has a sensitivity of just a few atoms.

Greg was a demanding graduate student advisor, guiding about 20 dissertations. After graduation, most of his students went on to prominent positions in industry, national laboratories and universities, or founded their own companies. He was also an excellent, and prolific, writer. In addition to his scientific papers, he wrote articles for a more general audience which were published in *Scientific American* and *La Recherche*. He also authored a widely used monograph "Films on Solid Surfaces" (1975).

He loved to engage in debates, often heated, with students and faculty on topics about which he was passionate. These included many science policy issues. Although little known now, Greg and Ed Stern were instrumental, in the late 60s and early 70s, in preventing the

location of an anti-ballistic missile silo in the Seattle area, one which would have made the city a prime target during these Cold-War years.

Greg and Joan were frequent and generous hosts to a wide range of guests from all walks of life. Countless visitors to the Physics Department remember fondly the warmth and engagement of an evening, sometimes peppered with lively debate, in their home.

At the age of seventy, still actively involved in research and teaching, Greg had to retire as required by then-existing law. However, he remained active in research as Professor Emeritus, and continued to teach, in collaboration with Ernest Henley, at the UW Transition School for gifted high school students.

The family has requested that memorial donations be made to Horizon House, Attn: Philanthropy Office, or to a favorite charity. The Department of Physics has a Jay Gregory Dash Graduate Fellowship in Experimental or Theoretical Condensed Matter Physics, and a Friends of Physics Fund. Contributions to either are tax deductible and can be accessed via the UW gift page or the Department of Physics web page (<http://www.phys.washington.edu>), "Support the Department" link.

Michael Schick, Oscar Vilches, John Wettlaufer, December 8, 2010