

WUPHYS: HISTORICAL MILESTONES

- 1853** Washington University is founded by Wayman Crow and William Greenleaf Eliot. The infant university is housed in buildings in downtown St. Louis.
- 1857** Funds are acquired to build a “superior telescope”. The 6-inch refractor, made by Fitz & Co. and later refigured by Alvin Clark, is still in service, providing astronomical viewing to the Washington University Community.
- 1875** Francis Nipher becomes Chair of Physics and the first Wayman Crow Professor. His nationally recognized research is diverse and includes electromagnetism, weather forecasting, and early psychophysical experiments on short-term memory. He introduces one of the nation's first laboratory courses in physics.
- 1880s** Washington University's observatory provides a source of standard time for the region and the coordination of railroad schedules.
- 1904** The Hilltop Campus is established to the east of the grounds of the 1904 World's Fair, and serves as the venue for intellectual activities of the 1904 World's Fair, including public lectures by Boltzmann and Poincaré, and Rutherford. The fairgrounds ultimately become Forest Park, which now separates the Hilltop and Medical campuses.
- 1904-1934** Physics resides in Eads Hall, one of the original structures of the Hilltop campus adjoining the main quadrangle.
- 1920** Arthur Holly Compton is appointed Wayman Crow Professor and Chair of Physics.
- 1921** The Compton Experiment is performed in a basement laboratory of Eads Hall, demonstrating the particulate behavior of X-radiation.
- 1923** Compton departs for Chicago and Arthur L. Hughes becomes Wayman Crow Professor and Chair. Hughes is noted for definitive experiments on the photoelectric effect, confirming Einstein's theory. In subsequent years, he mentors Lee Dubridge and appoints Clarence Zener to the faculty.
- 1927** Compton is awarded the Nobel Prize for fundamental research in quantum physics carried out at Washington University.
- 1934** Construction of Crow Hall. Designed by Arthur L. Hughes to accommodate a modern physics department, it features specialized facilities for research and laboratory instruction. Costing only \$257,000, it was the cheapest physics building in the country on a square-foot basis, yet was widely regarded as the best of its time.
- 1940** Arthur Hughes' recruitment of support in the Medical School and from Edward Mallinckrodt leads to the acquisition of a cyclotron second only to the Berkeley machine, to be employed in basic nuclear research and in the generation of radionuclides for clinical use. At the time, there is no cyclotron in Germany;

Heisenberg casts envious glances at the machine in Niels Bohr's Copenhagen institute.

- 1942** The Manhattan Project commandeers the WU cyclotron to produce the first significant samples of plutonium.
- 1945** Compton returns to Washington University as Chancellor.
- 1945-1949** Under the leadership of Compton, Hughes, and Joyce Stearns, Washington University experiences a vigorous expansion in the sciences, particularly physics and chemistry.
- Theory: Feenberg & Primakoff (nuclear shell theory; inverse Compton effect)
- Cosmic Rays: Sard
- Magnetic Resonance: Pake, later Norberg
- 1947-1948** Physics is the most heavily funded department in university, with sponsored research support almost twice that of Internal Medicine.
- 1953** George Pake succeeds Arthur Hughes as Chair.
- 1956** Following Pake's departure for Stanford, Chancellor Ethan Shepley hires Edward Uhler Condon as Chair of Physics and (in 1958) Wayman Crow Professor, defying HUAC and the McCarthyites in a striking affirmation of the principle of academic freedom.
- 1956-1957** Advances in NMR: Richard Norberg and Irving Lowe invent magic-angle spinning to narrow NMR lines and study free-induction decay in solids, providing the groundwork for Fourier-transform NMR.
- 1957** Sputnik orbital flight spurs science education and research funding.
- 1962-1963** Richard Norberg becomes Chair, succeeding Edward Condon. Norberg chairs the department for the next 29 years, falling short of Hughes' record by one year.
- 1963** Appointment of Daniel Bolef to the faculty brings ultrasonics to WU.
- 1964** Construction of Compton Laboratory, designed by Richard Norberg and Franklin Shull so as to mirror the efficient modular structure of Crow Hall. The project is funded by an NSF Science Development Grant and local benefactors.
- 1964** Eugene Feenberg is named Wayman Crow Professor, succeeding Condon.
- 1966** Robert Walker joins WU as McDonnell Professor of Space Physics.
- 1966** Completion of Compton Laboratory, designed by Richard Norberg and Franklin Shull so as to mirror the efficient structure of Crow Hall. The project

is funded by an NSF Science Development Grant and local benefactors.

- 1969** Lunar samples are analyzed in Walker's 4th-floor Compton Laboratory.
- 1974** WUPhys alumnus Michael Ter Pogossian develops PET at WU Medical School. Active in the French resistance during WWII, he had immigrated to the U.S. and St. Louis to study under Compton.
- 1974** The McDonnell Center for the Spaces Sciences is created through an endowment from James S. McDonnell, with Walker as its first director.
- 1975** Edwin Jaynes succeeds Eugene Feenberg as Wayman Crow Professor (information theory & statistical mechanics; maximum-entropy principle; Bayesian probability theory as the logic of science).
- 1977** The department hires mathematical physicist Carl Bender, who in succeeding years will build the particle-theory group. He trains generations of winners in the undergraduate Putnam Math competition.
- 1979** The Heavy Nuclei Experiment is launched on the third High Energy Astronomy Observatory satellite. Martin Israel serves as co-principal investigator, along with co-principals at Caltech and University of Minnesota.
- 1980** James Miller's Ultrasonics Laboratory increases in international prominence as its association with Medical School cardiologists produces breakthroughs in ultrasound characterization of the beating heart.
- 1980-1983** John Clark and his engineering-school colleague T. J. Tarn establish the theoretical foundations of quantum control.
- 1985** Walker's 4th-floor space physics group pioneers a new field of laboratory astrophysics, based on the revolutionary SIMS ion probe, employed to analyze presolar grains (literally stardust) isolated from meteorites. (SIMS = Secondary Ion Mass Spectrometry)
- 1986** The first high-pressure NMR experiment in a diamond-anvil cell is performed by Sam-Hyeon Lee, K. Luszczynski, R. E. Norberg, and Mark Conradi.
- 1988** Two new icosahedral quasicrystals in Ti are discovered by Kenneth Kelton and Patrick Gibbons.
- 1991** Clifford Will, noted gravitational theorist, becomes Chair.
- 1994** Saturday Morning Physics Series, open to the public, draws enthusiastic fans.
- 1998** Carl Bender and former student Stefan Boettcher revitalize the idea of quantum theory based on a non-Hermitian Hamiltonian by imposing the physical condition of space-time reflection symmetry.
- 1998** Developments in the Conradi lab lead to novel clinical applications of NMR to lung imaging on the WU medical campus.
- 1999** Department launches new thrust in biological physics.

- 1999** John Clark succeeds Edwin Jaynes as Wayman Crow Professor; James Miller is appointed as the first Albert Gordon Hill Professor.
- 2000** Center for Parallel Scientific Computing established as a university-wide resource with funding from the NSF and WU Arts & Sciences, with Wai-Mo Suen as Director. Its 128 CPU SGI Origin 3000 supercomputer allows state-of-the-art simulation of black hole collisions and resultant gravitational radiation.
- 2001** The first Cameca NanoSIMS 50 ion probe, developed by Cameca engineers in collaboration with WU scientists, begins operation in the Laboratory for Space Physics on the 4th floor of the Compton building. This remarkable instrument provides unprecedented sensitivity along with submicron resolution, opening a new domain for laboratory study of stellar materials.
- 2001** The Laboratory for Experimental High-Energy Astrophysics achieves a record-breaking cosmic-ray balloon flight over Antarctica, in an experiment to record trans-iron elements in galactic cosmic rays. Robert Binns is principal investigator of the NASA-sponsored project.
- 2002** John Clark succeeds Clifford Will as Chair.
- 2002** Stuart Solin joins the department as the first Charles H. Hohenberg Professor of Experimental Physics.
- 2002** Experiments performed by Kenneth Kelton's group vindicate a 50-year old explanation of how liquid metals resist solidification: Diffracted X-rays reveal a sequence of structure changes as a levitated drop cools and freezes.
- 2003** Renovations begin in Crow Hall to provide modern research space for the planned materials research center.
- 2003** Creation of the multidisciplinary Center for Materials Innovation is announced by the WU Board of Trustees. Stuart Solin appointed Director.