


## DOCUMENTS OF THE GENERAL FACULTY

**REPORT OF THE MEMORIAL RESOLUTION COMMITTEE FOR  
JOHN A. WHEELER**

The special committee of the General Faculty to prepare a memorial resolution for John A. Wheeler, professor emeritus, physics, has filed with the secretary of the General Faculty the following report.

  
Sue Alexander Greninger, Secretary  
The General Faculty

**IN MEMORIAM  
JOHN A. WHEELER**

John Archibald Wheeler had an extraordinary life as a distinguished scientist, citizen, family man, teacher, and peerless mentor. Those who came in contact with him were impressed with the intensity of his dedication, the rigor of his analysis, and the depth of his questioning. He died at his home in Hightstown, New Jersey, on April 13, 2008, at age ninety-six.

Wheeler was born in Jacksonville, Florida, on July 9, 1911. Growing up, he liked tinkering and mathematics. He received his Ph.D. in Physics from Johns Hopkins University in 1933 under the direction of the eminent physicist Karl F. Herzfeld. At Johns Hopkins, he used the then-new framework of quantum mechanics to study scattering and absorption of light by helium atoms. He began his postgraduate work with a National Research Council Fellowship, taking a first year with Gregory Breit at New York University and then a second year with Niels Bohr in Copenhagen. Upon his return to the United States, he married Janette Latourette Zabriske Hegner, with whom he remained married for seventy-two years. She died a few months before him. He is survived by three children: Letitia Wheeler Ufford of Princeton, James English Wheeler of Ardmore (Pennsylvania), and Alison Wheeler Lahnston of Princeton, as well as eight grandchildren, six step-grandchildren, six great grandchildren, and eleven step-great grandchildren.

In 1935, Professor Wheeler joined the faculty at the University of North Carolina. Three years later, he moved to Princeton University, where he stayed much of the rest of his life. At Princeton, he was the Joseph Henry Professor and later Joseph Henry Professor Emeritus.

Nuclear physics dominated Dr. Wheeler's early career. He invented the notion of the scattering S-matrix in 1937. He was one of the first people in the world to hear about nuclear fission when Niels Bohr visited Princeton in 1939. In the same year, he co-authored, with Bohr, a pioneering paper on the liquid-drop model of the nucleus, which provided a theoretical understanding of nuclear fission. Wheeler worked on the Manhattan Project during World War II, in particular on the design and operation of the reactors at Hanford, Washington, which produced plutonium. He continued his service to the government after the war, at Los Alamos from 1950 to 1952, as chairman of the Advanced Research Projects Agency of the Department of Defense in 1958, and in work on the hydrogen bomb under the auspices of Project Matterhorn at Princeton. In the wake of the launch of Sputnik in 1957, he advocated the consultation of scientists on important defense issues, first in what he termed Project 137 (named for the inverse of the fine structure constant) and then in what evolved into JASON, an institution that still operates today. He did not cease his work on fundamental questions in nuclear and particle physics, and he was instrumental in starting a cosmic ray laboratory at Princeton.

In 1952, Wheeler began work in a new direction. He turned his attention to what was then a backwater, the notions of curved space and time in Einstein's general theory of relativity. Wheeler's attention revitalized the field, both theoretically and as an experimental science, and helped to bring about the golden age of relativity, during which Princeton and Texas were two of the major recognized centers. He carried out seminal work on ultra-heavy stars and on the final stages of stellar evolution and introduced exotic structures, such as geons and wormholes, which have continued to fascinate theorists.

Upon retiring from Princeton in 1976, Wheeler joined the faculty of The University of Texas at Austin, where he founded the Center for Theoretical Physics. He was the Jane and Roland Blumberg Professor of Physics and Ashbel Smith Professor. During this time, his attention shifted from the fields of general relativity to issues of information and the quantum. His ability to state fundamental conundrums succinctly stimulated a great deal of thinking and commentary on the most profound problems facing physics. It was during this time that his "delayed choice" experiment on the collapse of the quantum wave function was performed by colleagues at Texas A&M University. From this time also came seeds of the understanding of quantum demolition, the transition from quantum to classical behavior in ever-larger systems. Wheeler returned to Princeton in 1986 and was named emeritus on his retirement from UT Austin.

Throughout his career, Wheeler regarded teaching and mentoring younger people as a critical aspect of his life. He left a cadre of famous students. With Richard Feynman, he developed key ideas concerning positrons and electrodynamics. With Kip Thorne, he brought new life to studies of neutron stars and black holes. The famous textbook, *Gravitation*, by Charles Misner, Thorne, and Wheeler has been a classic since its publication in 1973. Other general relativists who studied with Wheeler at Princeton include Jacob Bekenstein and William Unruh. While he was Wheeler's student at Princeton, Hugh Everett formulated the "many histories" approach to the interpretation of measurements in quantum mechanics, which has become increasingly influential. Among the graduate students supervised by Wheeler at The University of Texas at Austin were Wojciech Zurek, a pioneer in the development of the idea of decoherence in quantum mechanics, and William Wootters, who has made important contributions to quantum information theory.

In addition to his deep understanding of physics and concern for guiding students, Wheeler had a remarkable talent for wordsmithing. Although he did not invent the phrase, he was responsible for promoting the term "black hole," which both stimulated research and has become an iconic phrase in modern culture. He also famously invented the phrase "worm hole," which has also long since been assimilated into popular thought. Less well known, but still powerfully influential, were the phrases Planck length, time and mass, and "quantum foam," notions that remain central to the quest for rigorous theory of quantum gravity. He summarized general relativity with the phrase "matter tells space how to curve and curved space tells matter how to move." He captured the profoundly simple essence of black holes with the phrase "a black hole has no hair." He defined the fundamental issues involved in existence in terms of information, "it from bit." And he commented, "topology is too important to be left to the mathematicians."

Wheeler published ten books as well as a voluminous record of research papers. He received many awards, among which were the Cressy-Morrison Prize of the New York Academy of Sciences, 1946; the Enrico Fermi Award of the U.S. Energy Research and Development Agency, 1968; the Franklin Medal of the Franklin Institute, 1969; the Einstein Medal, 1969; the National Medal of Science, 1971; the Herzfeld Award, 1975; the Niels Bohr International Gold Medal, 1982; the Oersted Medal, 1983; the J. Robert Oppenheimer Memorial Prize, 1984; the Wolf Prize in Physics, 1997; and fourteen honorary doctoral degrees from universities throughout the world. His teaching skills are attested by the following: the "Outstanding Graduate Teacher" award, The University of Texas, 1981; the Moni Ferst Award from Georgia Tech, 1981; the outstanding quality of his several texts and monographs; and, above all, the accomplishments of his many students.

In 1998, Wheeler co-wrote with Kenneth Ford a remarkable autobiography, *Geons, Black Holes, and Quantum Foam: A Life in Physics*. A special memorial issue of *Physics Today* was devoted to Wheeler in April 2009.

In 1986, on the occasion of John A. Wheeler's retirement from teaching, The University of Texas at Austin established an endowment for graduate fellowships in physics. At the time of his death, in recognition of his contributions to the United States, to Texas, to The University of Texas, and to science, the University named the largest lecture hall in the building housing the departments of physics, astronomy, and mathematics in his honor: *The John A. Wheeler Lecture Hall*.

This memorial resolution was prepared by a special committee consisting of Professor Steven Weinberg (chair), Austin M. Gleeson, and J. Craig Wheeler.

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