

OBITUARIES

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Ronald Crosby Davidson

Pioneering plasma physicist Ronald Crosby Davidson died on 19 May 2016 in Cranbury, New Jersey, due to complications from pneumonia. Long-time editor-in-chief of *Physics of Plasmas*, he also directed the Princeton Plasma Physics Laboratory (PPPL) during a crucial period of its history and was a founding director of the Plasma Fusion Center at MIT.

Ron was born on 3 July 1941 in Norwich, Ontario, Canada. He grew up on a family dairy farm, where by age 11 he was driving a tractor and pitching in wherever needed. Ron learned at an early age how the annual cycle of farm activities comprised seasonal tasks, none of which could be postponed. Many years later, both as lab director and as editor-in-chief, Ron would be struck by similarities between farm tasks and administrative responsibilities. Likewise, his colleagues would be struck by Ron's early-riser habits, incredible energy, and penchant for getting things done as early as weather would permit.

Had he been the oldest child, Ron would have inherited and been expected to run the family farm. Instead, after he finished eighth grade in a one-room schoolhouse, Ron developed a passion for physics and mathematics in high school that drove his monumental impact in plasma physics.

Ron earned a BSc degree in physics from McMaster University in 1963. He received his PhD in astrophysical sciences from Princeton University in 1966 under the advice of Edward Frieman. After an exceptionally distinguished career at several institutions, Ron arrived at MIT in 1978 with the challenge of organizing and expanding its plasma-science research, especially the Alcator tokamak program. He established the MIT Plasma Fusion Center with a broad scientific agenda that included toroidal and mirror field confinement experiments, theory and computation, magnet engineering, and particle-beam research. Ron returned to Princeton in 1991 to serve as a professor of astrophysical sciences and, until 1996, as director of PPPL.



Ronald Crosby Davidson

Ron made fundamental theoretical contributions to several areas of pure and applied plasma physics, including non-neutral plasmas, nonlinear effects and anomalous transport, kinetic equilibrium and stability properties, propagation of intense charged-particle beams in high-energy accelerators, and coherent radiation generation by relativistic electrons. He is the author of more than 450 journal articles and several books. His 1972 book, *Methods in Nonlinear Plasma Theory* (Academic Press), served as a key early textbook on plasma physics. He also is known for his advanced research monographs, including *Theory of Nonneutral Plasmas* (Benjamin Press, 1974), *Physics of Nonneutral Plasmas* (Addison-Wesley, 1990), and, with one of us (Qin), *Physics of Intense Charged Particle Beams in High-Energy Accelerators* (World Scientific, 2001).

As director of PPPL, Ron oversaw the achievements of the Tokamak Fusion Test Reactor (TFTR) during its deuterium-tritium campaign. In December 1993, for the first time in the history of tokamak plasma devices, a reactor fuel mix of 50% deuterium and 50% tritium was used. Introducing that fuel mix into the TFTR released about 6 million watts of fusion power. In November 1994 the TFTR achieved 10.7 million watts of fusion power for one second, enough to momentarily power 2000 to 3000 homes.

Ron gave years of distinguished service to the physics community as the chair of two divisions—plasma physics and physics of beams—of the American Physical Society and as editor-in-chief for *Physics of Plasmas* from 1991 to 2015. One of the longest-serving editors at the American Institute of Physics (which publishes *PHYSICS TODAY*), Ron was an inspirational leader who conducted his editorial service with humble kindness. Shortly after becoming editor of *Physics of Fluids B*, he established *Physics of Plasmas* as its successor. Thereafter, his steady leadership, research excellence, and welcoming embrace of the international community of plasma physicists led to the expansion of *Physics of Plasmas* and its becoming the most highly cited journal in its field.

Among his many recognitions and honors, Ron received the Kaul Foundation Award for Excellence in 1993, the IEEE Particle Accelerator Science and Technology Award in 2005, the American Physical Society's James Clerk Maxwell Prize in Plasma Physics in 2008, and the Fusion Power Associates Distinguished Career Award in 2014.

To his students and young colleagues, Ron was a gentle, exemplary mentor with high standards for scientific quality, especially in the implementation of research projects. His moral compass was so clear that the rest of us would lean over his shoulder at critical moments to see which way it was pointing. As a scientist and friend, Ron will be greatly missed.

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Harold Walter Kroto

Harold Walter Kroto was an exceptional human being. Not only was he a groundbreaking scientist whose work earned him a share of the 1996