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Gerald Edward Brown

Gerald Edward Brown, a theoretical physicist who played a key role in the development of modern many-body physics, nuclear physics, and astrophysics, died at his home in Setauket, New York, on 31 May 2013. Gerry was a State University of New York Distinguished Professor Emeritus with the department of physics and astronomy at Stony Brook and the C. N. Yang Institute for Theoretical Physics. His influential research began in the years following World War II, as physicists turned from war work to fundamental research and delved deeper and more precisely into the motion of electrons in atoms and the internal structure of atomic nuclei.

Gerry was the author or coauthor of nearly 400 research papers that delved deeply into a wide range of topics. He was drawn to some of the most difficult problems; for example, in his early work in atomic physics, he worked out the Lamb shift in high- Z atoms. The methods he developed over the years to treat strongly interacting and many-body systems are still in use today.

One of Gerry's landmark achievements was to establish, through a renormalization group-based theory of nucleon-nucleon interactions, a microscopic basis for nuclear structure that unified multiple phenomenological fits to nuclear forces. He successfully applied the theory of nucleon-nucleon forces to the bulk properties of nuclei and effective theory parameters, in the spirit of Landau-Fermi liquid theory. His model for nucleon structure, known as "little Brown bag," put early emphasis on the pion and vector meson "cloud" surrounding the quark core.

Gerry was a consistent leader in applying the chiral symmetry of quantum chromodynamics to nucleon structure and nuclear physics. His use of hidden gauge symmetry for vector mesons is now naturally explained by holographic models.

Another famous program of Gerry's was devoted to supernovae. It included a game-changing analysis of the nuclear equation of state and entropy, which led



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to many insights into the formation of neutron stars and black holes.

Gerry collaborated widely; he was particularly proud of his scientific and personal relationships with those he called his "three eagles": Gregory Breit, his doctoral adviser; Rudolf Peierls, the leader of the theory group at the University of Birmingham in the UK; and Hans Bethe, his partner for 30 years in the study of supernovae. In the final years of Gerry's career, he served as Bethe's scientific executor, and with Chang-Hwan Lee he edited a biographical tribute, *Hans Bethe and His Physics* (World Scientific, 2006).

He had outstanding success in his own right as a teacher and doctoral research adviser. Gerry supervised more than 70 doctoral students and maintained strong professional and personal ties with many of them. He was known for his generosity and kindness as a mentor.

The son of a mathematics professor and nephew to several farmers, Gerry was born in Brookings, South Dakota, on 22 July 1926. In 1943 he left high school to enlist in the US Navy. The war ended while he was still in an officers' training program that included study at the University of Wisconsin. He used the GI Bill to attend the university, where he earned his bachelor's degree in physics in 1946.

In 1947 Gerry moved with Breit, his adviser, to Yale University; he received a PhD in physics in 1950. As a graduate student at Yale, Gerry involved himself in left-wing politics; he eventually joined the Connecticut State Communist Party but was quickly expelled for questioning the party line. Subsequently, he maintained a principled resistance to providing information on former associates. With the McCarthy era on the horizon, he moved to the University of Birmingham at Peierls's invitation. After earning a DSc degree in one year there, he continued on as a lecturer and eventually a professor.

For much of the 1950s, US authorities refused to renew Gerry's passport, which limited his ability to travel. He received a new passport only in 1958, after the US Supreme Court ruled that the State Department had acted without authority in denying passports to US citizens because of alleged Communist ties. In 1960 he joined the Nordic Institute for Theoretical Atomic Physics (NORDITA) in Copenhagen, and in 1964 he became a professor of physics at Princeton University and split his time between the two institutions. He moved from Princeton to Stony Brook University in 1968; he was drawn to the relatively new school by Nobel Prize recipient C. N. Yang, who had himself joined Stony Brook two years earlier. In 1985 Gerry retired from NORDITA and became a full-time professor at Stony Brook, where he stayed until his retirement in 2009.

Among his numerous awards and honors, Gerry received the 1982 Tom W. Bonner Prize in Nuclear Physics and the 2001 Hans A. Bethe Prize, both from the American Physical Society; the 1992 John Price Wetherill Medal from the Franklin Institute; and the 1996 Max Planck Medal from the German Physical Society. He was a founder and longtime editor of the journals *Physics Letters*, which specializes in short, high-impact papers, and *Physics Reports*, which is devoted to in-depth reviews.

Gerry's extraordinary insight, numerous acts of kindness, and wry sense of humor made him a legend in the worldwide physics community. In "Fly with Eagles," published in 2001 in *Annual Review of Nuclear and Particle Science* (volume 51, page 1), he left an engaging scientific and personal memoir.

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