obituaries

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Kazuhiko Nishijima

Kazuhiko Nishijima, a celebrated theoretical physicist who made significant contributions to the early development of particle physics, passed away from leukemia on 15 February 2009 in Tokyo.

Born on 4 October 1926 in Tsuchiura, Japan, Nishijima studied physics at the Imperial University of Tokyo right after World War II and in 1948 obtained his diploma. In 1955 he earned a doctor of science degree from Osaka University for his thesis on the nuclear potential. It was the time when Sin-itiro Tomonaga, with his students and in competition with other physicists across the globe, was developing the renormalization theory at the University of Education (the predecessor of the University of Tsukuba), located near the University of Tokyo. Also at that time, researchers were discovering new particles in cosmic rays.

Nishijima began his career in 1950 as an assistant at the newly created Osaka City University, where I also got a position. I formed a theory group of five members. Nishijima, one of the youngest members, worked on theoretical problems related to strong interactions in quantum field theory and on the phenomenology of the strange, or V, particles to try to make sense of their general properties. His first paper on the particles, done in collaboration with

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Kazuhiko Nishijima

me and other colleagues, was a hypothesis regarding pair production of strange particles, which explains, in terms of a weakly conserved quantum number, why each product has a long life. With his colleague Tadao Nakano, and independently of Murray Gell-Mann, Nishijima subsequently discovered what is now referred to as the NNG rule, $Q = I_3 + S/2 + B/2$, relating the electric charge Q to strangeness S, isospin I_3, and baryon number B for hadrons then known. The rule led to predictions about the Ξ hyperon and paved the way for establishing the flavor $SU(3)$ symmetry (by Gell-Mann and by Yuval Ne'eman) and eventually the quark model (by Gell-Mann and by George Zweig).

Nishijima's papers on field theory caught the attention of Werner Heisenberg, who was working on a unified theory, and in 1956 Nishijima was invited to Göttingen, Germany, where he spent a year and a half. In 1958 he moved to the US. After staying for a year and a half at the Institute for Advanced Study in Princeton, New Jersey, he became a professor at the University of Illinois at Urbana-Champaign. His work during that period again ranged from phenomenological to formal and included a postulate of a massless pseudoscalar field to conserve chirality—essentially a nonlinear realization of spontaneously broken chiral symmetry—and a formulation of composite particles in field theory.

In 1966 Nishijima ended his wandering years and returned to his alma mater, the University of Tokyo. He established a particle theory group and began to nurture the second generation of particle theorists, but he also served in administrative positions. He was director of the Research Institute for Fundamental Physics at Kyoto University from 1986 to 1989, and from 1995 to 2005 he was the president of the Nishina Memorial Foundation, which promotes physics in Japan. In those capacities, he displayed political skill and foresight, strengthening his institutions and helping others to get proper funding. But he also continued to work until near his death on various subjects in particle theory, such as color confinement and noncommutative spacetime. Among the prizes and honors he received are the Nishina Memorial Prize, the Japan Academy Prize, and the Order of Culture of Japan.

I had the good fortune to be one of Nishijima's oldest friends and colleagues. We called him Kaz, and we loved him for his gentle manners, broad-mindedness, and wisdom and for how he combined those qualities with sharp and witty comments and observations that did not hurt people but were to the point nevertheless—a sort of Wignerian Pauli-ism. Less known were his linguistic abilities. In a short period of time he mastered German and Italian to such a degree that he was able to give lectures in both.

I will end by quoting one of his witticisms. For a time at the University of Illinois, he shared his office with his close friend Rudolf Haag. Each frequently received students and collaborators, which disturbed the other. When Haag complained about it and tried to discuss a solution, Nishijima answered philosophically, "He whom it does not concern does not listen."

Yoichiro Nambu
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Alfred Brian Pippard

Alfred Brian Pippard, who pioneered the concept of nonlocal electrodynamics in normal and superconducting metals and was the first to map a Fermi surface, died in Cambridge, UK, on

Recently posted death notices at http://www.physicstoday.org/obits:

Jack Eddy
25 March 1931 – 10 June 2009
George K. Fraenkel
27 July 1921 – 10 June 2009
Jack Dainty
7 May 1919 – 29 May 2009
Morris Krauss
1932 – 29 May 2009
Thomas W. Stern
1923 – 23 May 2009
Roger Kelly
11 June 1933 – 2 April 2009

21 September 2008, following a stroke.

Brian was born in London on 7 September 1920. He spent his formative years in Bristol and attended Clifton Senior College, then considered the premier school in the country for teaching science, from 1934 to 1938. He was an undergraduate at Clare College, Cambridge, and earned his BA in physics in 1941. During World War II he made important contributions to the development of radar. He subsequently returned to Cambridge as a research student under David Shoenberg at the Royal Society Mond Laboratory, originally built for Pyotr Kapitsa in 1933. Brian received his PhD in physics in 1947 for his work on measurements of the surface impedance of superconducting and normal tin and mercury and of normal gold and silver. Staying at Cambridge, he moved progressively through the academic ranks and was elected Cavendish Professor of Experimental Physics in 1971. He remained in that position until his retirement in 1982. He was knighted in 1974.

Brian had returned from World War II with an assortment of microwave components and set to work to exploit them. Using microwave resonators, he measured the real and imaginary parts of the surface impedance. From his results on normal metals, Brian developed the idea of the "anomalous skin effect," which sets in when the electron mean free path exceeds the skin depth—the depth to which the microwaves penetrate. He realized that there must be a nonlocal relation between current and electric field, a seminal idea that was put on a firm theoretical footing by Harry Reuter and Ernst Sondheimer and by Robert Chambers. Brian's most important result on superconductors derived from his measurements of the magnetic penetration depth in pure tin. He concluded that, analogous to the behavior in normal metals, the relation between the supercurrent and the vector potential was nonlocal, with a coherence length ξ. This deduction demonstrated Brian's extraordinary insight: The coherence length is a central parameter in the microscopic theory of superconductivity developed by John Bardeen, Leon Cooper, and Robert Schrieffer.

While on sabbatical leave at the University of Chicago in 1955–56, Brian measured the anomalous skin effect in a large single crystal of copper for a variety of orientations. In a remarkable feat, he deduced the Fermi surface—the first-ever determination.

Brian passionately believed that research and teaching went hand in hand.


Alfred Brian Pippard

CAVENDISH LABORATORY, CAMBRIDGE UNIVERSITY

He felt that high standards of classroom teaching should be a requirement for faculty appointments and promotions. He played an ongoing role in revising the undergraduate teaching curricula at Cambridge. His interest in teaching extended to his supervision of research students and postdoctoral fellows. Although it is probably true that none of us ever won an argument with him because he was so quick-witted, he could be very kind and patient, and many of us recall with great affection his friendship and intellectual leadership.

Brian had a great influence on Cambridge's infrastructure. In 1966 he became the first president of Clare Hall. He oversaw the design of the college, which was founded to accommodate academic visitors of all disciplines during their sabbatical leaves. Clare Hall offered hospitality not only to its distinguished visitors but also to their families. Brian was also the driving force behind moving the Cavendish laboratory from its overcrowded site in the center of the city to its current site in West Cambridge. He was heavily involved in both fundraising for and the design of the new Cavendish. A guiding principle was that the design be sufficiently flexible to allow for laboratories to be reconfigured to accommodate new experiments and equipment. That idea has proved highly successful, and the laboratories have subsequently undergone many transformations.

Perhaps Brian's greatest strengths were his ability to pick the right experiment at the right time and his extraordinary insight into interpreting data without detailed calculations. Examples include his understanding of the coherence length in superconductors and his determining the Fermi surface of copper from largely geometrical considerations. But he never made use of the full formalism of quantum mechanics. When his graduate student Brian Josephson worked out the theory of Cooper pair tunneling between superconductors that was to win him a Nobel Prize, Brian claimed that he did not understand Josephson's calculations.

Aside from physics, Brian was a passionate piano player. He owned two grand pianos and played them until the last few months of his life. He loved to discuss and argue, as I well recall from the tea that he enjoyed with his students, postdocs, and colleagues almost every day. One of my favorite memories is a story he told about himself. After the war he served on a committee charged with naming various microwave components that had been invented for radar. A member of the committee proposed that one of them be named the "Pippard plate." Feeling that a mild display of modesty was in order, Brian murmured (as I recall), "We can't possibly call it that." To Brian's chagrin, the chair concurred: "No, I suppose we can't!"

John Clarke
University of California, Berkeley ■