

Dr. Donald G. Coyne

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Dr. Donald G. Coyne, Professor Emeritus of Physics, UC Santa Cruz, who enjoyed a distinguished career in experimental particle physics and astrophysics, died October 1 in Santa Cruz after many years of battling prostate cancer. He was 71 years old.

Professor Coyne was Adjunct Professor of Physics at the University of California, Santa Cruz since 1985. Though he retired from UCSC in October, 2002, he remained intellectually active. His most recent project was helping to establish the Milagro very-high-energy gamma-ray detector near Los Alamos, NM. For this he was the principal investigator of the National Science Foundation-sponsored Milagro subgroup of the Santa Cruz Institute for Particle Physics SCIPP. His group had major responsibilities in the construction and operation of the Milagro telescope.

Dr. Coyne also made important contributions to other fields in physics, including theoretical physics. He spoke at several conferences on his conceptual scheme to extend the mass of black holes below the Planck Mass, the current theoretical limit, without resorting to extra dimensions. His recently-completed paper with Dr. David Cheng on this subject predicted the detection of low mass black holes in the Large Hadron Collider LHC in Cern, Switzerland. He looked forward to the findings at LHC, but only lived long enough to see the collider start up.

For his lifetime of contributions in physics, Dr. Coyne was honored as a Fellow of the American Physical Society.

Don was born October 28, 1936, in Hutchinson, Kansas. In high school he was interested in art and astronomy, and was a leader on the prize-winning Hutchinson High School debate team. He graduated in 1954 with the Jolliffe, RCA, and Sommerfield scholarships. He went on to the University of Kansas, from where he graduated with a BA in Engineering Physics and a Woodrow Wilson Fellowship. Subsequently, he attended the California Institute of Technology, graduating with a PhD in elementary particle physics in 1967. He had a post-doctoral fellowship at UC Berkeley's Lawrence Radiation Laboratory, after which he worked at the Stanford Linear Accelerator SLAC for a number of years and at Princeton University before joining the University of California, Santa Cruz.

In addition to his research, Don was extraordinarily generous as a teacher and mentor. He actively promoted younger colleagues and never hesitated to stand aside, giving them opportunities for exposure and recognition. In addition to advising several Ph.D. students and

post-doctoral fellows, he devoted hundreds of hours to working closely with students on undergraduate theses. Over the course of his career, particle physics and astrophysics evolved from small projects to big science, where there is a risk of losing contact with the motivating science. Don's enthusiasm for the science always came through and inspired those around him.

Don loved science, debating ideas, building things, art, classical music, hiking, rock climbing, and wilderness camping. He designed his home in Bonny Doon, where he participated extensively in community functions, serving for many years as an officer of the Rural Bonny Doon Association. He recently fulfilled a life-long ambition by becoming a licensed pilot so that he could fly his ultra-light aircraft, a powered parachute, which he built himself.

Don is survived by his wife, Dr. Melanie J. Mayer, Professor Emerita, UC Santa Cruz; two daughters from a previous marriage: A. Heather Coyne, Washington D. C. and Laurel Gwendolyn Coyne, Monterey; a sister Juliet Johnson-Cassady, Taylorville, IL, and a brother Dr. Michael Coyne, Ashburn, VA.

Donald Coyne

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Donald G. Coyne, retired Adjunct Professor of Physics at the University of California, Santa Cruz, passed away on October 1, 2008 in Santa Cruz, after a decade-long fight against cancer. Don was the quintessential elementary particle physicist from the era in which researchers proposed, performed and published the results of experiments in two to three year cycles and were at ease with all aspects of the trade, from the craft-like to the more mathematical ones. Don's career spanned particle physics from hadron spectroscopy, pursued with bubble chambers, through the first decades of electron-positron storage rings up to the present times when collaborations of many hundreds of physicists build very large experimental facilities at colliders. In the last two decades, he led his group into very-high-energy gamma-ray astrophysics. To him, it was a way to approach the problems at the interface of particle physics and gravity, which he mused about during the decades he spent at particle accelerators and to which he actively contributed from the early 1990's continuing through the years of his retirement.

Don was born in 1936 in Hutchinson, Kansas. He obtained a B.S. in Engineering Physics from the University of Kansas in Lawrence in 1958, and a Ph.D. in Experimental Particle Physics from the California Institute of Technology in 1967. His postdoctoral years (1966-1970) were spent at the Lawrence Radiation Laboratory (LRL) in Berkeley, California, and were followed by fifteen years at Princeton University, first as Assistant Professor and then as Senior Research Physicist. In 1985, he moved with the research group he was leading to the Santa Cruz Institute for Particle Physics (SCIPP), where he served as Adjunct Professor until his retirement in 2002.

A description of the highlights of Don's scientific career necessarily begins with his thesis research, which consisted of performing a bubble-chamber photoproduction experiment from scratch at the CalTech electron synchrotron. He redesigned, rebuilt and put through its paces a heavy-liquid bubble chamber, designed and built the photon beam, performed the experiments to measure the reactions $\gamma p \rightarrow \pi^+\pi^-; p$ and $\gamma d \rightarrow K^0\Lambda^0, K^0\Sigma^0$, reconstructed and analyzed the final states and finally published the results. It was a one-man tour de force, during which he perfected

his characteristic mixture of intellectual strength, inventiveness, self-reliance, depth and scientific rigor.

This training served him well throughout his career, beginning with a number of experiments as a member of the Trilling-Goldhaber group at LRL, and continuing in the Princeton group initially led by the late G. K. O'Neill and subsequently by Don himself. During these years he was a co-discoverer and one of the main analyzers of ρ - ω interference. He then led a number of small experiments at SPEAR that produced evidence for the then-disputed τ lepton and helped to put in order the charmonium system during the heady years around the discovery of the J/ψ in 1974. His tenure as Senior Research Physicist at Princeton coincided with his leading the group into the Crystal Ball experiment, which discovered or made precision measurements of several states involving radiative transitions in the charmonium system. Among Don's more original ideas of those years was his proposal to search for gluonium states in the radiative decays of the J/ψ (and later of the Upsilon family). On the more experimental side, he was the first in proposing and later had a pioneering role in establishing the use of BGO crystal calorimeters in particle physics. This work resulted in several major experiments based on this technique, by groups other than his.

An amateur interest in astronomy nurtured since his youth took root professionally when Don's group joined the CYGNUS and Milagro very-high-energy gamma-ray experiments at Los Alamos. This was the initial step extending the scope of experimental work at SCIPP into astrophysics, which has now become a major area of research in the Institute. He used CYGNUS and Milagro to search for emission from gamma-ray bursts observed by satellite-borne detectors, as well as for bursts from the Hawking radiation of exploding small black holes. The latter initiative marked the beginning of his active involvement in research on the possible connection between the quantization of small black holes and the fundamental particle spectrum. He remained passionately engaged in this topic to his very last days, eagerly awaiting what the first data from the LHC would have to say on the subject.

Don was extraordinarily generous as a teacher and mentor. He actively promoted younger colleagues and never hesitated to stand aside, giving them opportunities for exposure and recognition. In addition to advising Ph.D. students and post-doctoral fellows, he devoted hundreds of hours to working closely with students on undergraduate theses. Over the course of his career, particle physics and astrophysics evolved from small projects to big science, where there is a risk of losing contact with the motivating science. Don's enthusiasm for the science always came through and inspired those around him.

Don had a love of mountains and the outdoors, manifest in his younger days by a passion for climbing and in more recent years by his choice to live in the rural Bonny Doon mountains above Santa Cruz, where he was active in the local community. In his retirement, Don became an avid flier of powered-parachute ultralight aircraft. He shared his exhilaration with family and friends whom he took aloft in the two-seat, open-air craft.

At all times of his life Don could be found to be deeply involved in one or several of the many projects he engaged in – physics, of course, ranging from the speculative to the highly technical – but also building houses of his own design for his family, flying, or cultivating personal relationships. Don freely communicated his original ideas, his opinions and his findings to those he was close to, personally or professionally, by word or by example. His influence on all these persons has been profound and will be long-lasting. He is survived by his wife, Melanie Mayer, Professor Emerita of Psychology at U.C. Santa Cruz, daughters A. Heather Coyne and

Gwendolyn Coyne, sister Juliet Johnson-Cassady and brother Michael Coyne.

More information

Submitted by: Matteo Cavalli-Sforza^{1, 2} and David A. Williams^{1, 2}

¹ Instituto de Física de Altas Energias, Universidad Autonoma de Barcelona

² University of California Santa Cruz