

Raymond V. Adams
1920-2007
Professor of Physics, Emeritus
B.S. Kansas State University, Ph.D. California Institute of
Technology
California State University, Fullerton 1960-1989
Birth: October 5, 1920; Death: February 2, 2007

Ray Adams joined the faculty of California State University, Fullerton in 1960, the first year that the university, then known as Orange County State College, offered classes at its permanent location in Fullerton. He became the founding Chair of the Department of Physics the same year. Before coming to Fullerton he had served as an assistant professor at Yale University, as an associate professor at Mount Holyoke College, and as a professor of physics and acting department chair at Wayne State University.

Ray earned his Ph. D. in physics at Caltech under the supervision of Nobel Laureate Carl D. Anderson discoverer of the positron and the muon. Ray's research was in cosmic-ray physics. (This work earned him the nickname "Cosmic-Ray" among some of his colleagues.) Much of his research involved the analysis of cloud chamber photographs obtained from high-altitude aircraft and rocket flights. Ray served as a scientific advisor to the Army's Far East Air Forces during 1945, where he provided technical assistance in field training pilots in the use of rockets. Ray also was elected to fellowship in the American Physical Society in recognition of his contributions to the discipline.

Ray designed the facilities that were to house the new physics department in the first permanent building on campus, now known as McCarthy Hall. He also hired the first generation of faculty members to staff the department. Among them were Professors Harvey Blend, Roger Dittmann, Ron Crowley, Ed Cooperman, and Kurt Bengtson.

Ray and Harvey Blend were responsible for purchasing scientific equipment for the new department. Capital funds to equip the department were appropriated as part of the construction budget for the new building. Harvey convinced Ray to request the sum of \$1,000,000 for equipment (equivalent to more than \$7 million in today's dollars) though Ray initially suggested a much more modest equipment budget. To everyone's surprise the larger sum was approved; and, the department purchased enough equipment not only to outfit its teaching laboratories, but also enough

research-grade scientific equipment to attract faculty members to the department who had serious research interests even though Fullerton was a new university that, at the time, offered only a bachelor's degree in physics.

Another of Ray's tasks as founding chair of the department was the design of the curriculum. At the time, most undergraduate physics programs were very heavy on theoretical physics courses and very light on experimental, laboratory-based courses. The reasons for that were two-fold. First, the undergraduate physics major was viewed primarily as preparation for graduate study in physics. And, it was assumed that budding experimental physicists would learn their craft during their graduate studies. Second, laboratory courses were expensive to offer both in terms of equipment and faculty involvement.

Ray broke with tradition knowing that there would be a demand for bachelor-level physics graduates in the burgeoning high-technology industries in the area (aerospace and electronics companies were establishing a large presence in Orange County as the campus developed). He also appreciated the fact that many of our students were older, and probably would not want to spend the time needed for graduate school. An undergraduate physics degree with an emphasis on laboratory courses would equip these graduates with the background needed to compete for industrial positions.

Over the years the experimental courses in the undergraduate physics curriculum evolved to meet the needs of the department's students, but the tradition started by Ray Adams has continued to the present. The CSUF Physics Department has always provided a much richer offering of advanced laboratory courses than most undergraduate physics programs in the United States.

Ray could be a rigorous taskmaster both in the teaching lab and in the classroom, much to the chagrin of less ambitious students. But, he also was recognized as an inspiring teacher and mentor. Dr. Kurt Bengtson, a former CSUF physics faculty member and student of Ray's at Wayne State University notes that Ray was one of the most inspiring teachers that he has encountered. In fact, the quality and clarity of Ray's instruction was a major factor in Kurt's decision to choose physics as a career.

Fred Austin, one of Ray's early students at Fullerton recalled that Ray's focus was always on the student. He would train his students to understand and solve problems using first principles. New freshman physics majors often were "treated" to

a pamphlet he had written on the proper way to study and learn physics. Ray was fond of saying that it took more than a single reading to understand the full meaning of the material. He always had time for his students. He was tireless in this respect. If a student was interested in learning physics, Ray would spend as much time working with the student as the student was willing to devote. Ray also encouraged independent studies where students were guided through independent research projects learning how to take seemingly impossible problems and break them down into digestible bites. One of the most important things Ray would instill in his students was the ability to learn new material themselves. He emphasized that complex problems needed to be looked at from all perspectives, analogies considered, and first principles applied. Soon, that insurmountable problem was not as difficult as it first appeared.

Ray was an active member of the southern California Caltech Alumni Chapter. He often would invite physics majors to accompany him to Caltech Alumni Association dinners in Pasadena, where they would hear talks from eminent Caltech faculty members.

Two aspects of Ray's classroom teaching deserve special mention. First, was his extensive use of demonstrations during his lecture classes. While there is a long tradition of using lecture demonstrations to illustrate physical principles in physics classes, Ray raised the use of lecture demonstrations to a new level. In addition to using many of the standard lecture demonstrations that physics instructors had used before, Ray developed many original ones for use in his class. When I joined the department in 1970, I was amazed by the number of lecture demonstrations that were available, thanks to Ray. The selection rivaled those of much larger physics departments.

Second, was Ray's use of the overhead projector. While this device was commonplace in our classrooms and teaching labs before the advent of "smart" classrooms, Ray's techniques with the overhead projector went well beyond the usual. In courses such as optics and electromagnetic waves he would use overlays of meticulously prepared transparencies to bring to life the difficult theoretical concepts that he was discussing.

Many of Ray's Fullerton students have later returned to thank him for the education they received in his classes, which they credit for their success. Among them was Dan Black - one of the department's first physics majors, who used his training in the undergraduate nuclear physics laboratory that Ray helped to

develop to obtain his first job and later to establish his first business. Dan's recent major contributions to the Physics Department and to the University show the extent to which he valued his early training in the department.

Ray's research career in physics was over by the time he became Chair at Fullerton. Nevertheless, he was a strong supporter of research both by faculty and students within the department. He understood that scholarly activity on the part the faculty ensured that they would keep abreast of the latest developments in the discipline, and that the students who were involved in research projects under the supervision of faculty members would learn the lore of physics that was not usually found in textbooks.

Throughout his career Ray retained a keen interest in developments in electronics, computers, and experimental techniques. He received a grant from the National Science Foundation in 1981 to develop experiments in automated data collection for one of our undergraduate laboratory courses.

Ray enjoyed tinkering with the latest electronic equipment. He taught himself the basics of solid-state electronics; and, he used that knowledge to design experiments for our upper-division electronics lab. He also built computers and robots from kits for his own use. Another of his passions was the cultivation of orchids. He frequently brought the most beautiful of these into the department office for everyone to enjoy.

In addition to his work to develop the physical and intellectual structure of the Physics Department, Ray Adams was an early leader in faculty governance at Cal State Fullerton. He was instrumental in developing the first Faculty Council Constitution, and served as one of the early chairs of the Faculty Council (now the Academic Senate). He was one of a group of early faculty members who together with founding President William B. Langsdorf established the principles of shared governance that later became known as the "Fullerton way" throughout the California State University system.

Ray left no immediate survivors; however, his memory lives on in the physics department through the Constance B. Eiker and Raymond V. Adams Fund. This endowment, which memorializes both Ray and his stepmother, provides awards to physics majors who develop experiments that can be used in the department's undergraduate teaching laboratories.

Submitted by

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