CHARLES A. DESOER

1926–2010

Elected in 1977

“For contributions to control and system theory, and for innovation in engineering education.”

BY SANJIT K. MITRA

CHARLES A. DESOER, professor emeritus of electrical engineering and computer sciences at the University of California, Berkeley, died November 1, 2010, in Oakland, California, at the age of 84, of complications from a stroke.

Charlie, as he was known universally, was born on January 11, 1926, in Brussels. He fought with the Belgian Resistance during the German occupation in World War II and joined the Belgian Army after the liberation. He obtained a degree as a radio engineer from the University of Liège in 1949 and an ScD in electrical engineering at the Massachusetts Institute of Technology in 1953. He then went to work at Bell Laboratories in Murray Hill, New Jersey, until 1958, when he left to join UC Berkeley as a professor of electrical engineering and computer sciences. He continued to serve the campus as professor emeritus after his retirement in 1993.

Charlie was a world-renowned researcher, research supervisor, and dedicated educator. His research focused on the analysis, design, and control of linear and nonlinear circuits and systems that contributed to the burgeoning growth in control applications and benefited the aerospace, transportation, process control, and other essential industry sectors.
He was an exceptionally gifted teacher, with a style that emphasized clarity of thought and elegance of presentation, both of which were evident in his seminal textbooks on circuit theory, linear systems theory, and feedback control. Some of his texts are still considered the most authoritative references on circuits, systems, and control, and “widely regarded as classics in the field [that] have set a high standard for their clarity of thought and presentation, as well as a deep commitment to intellectual elegance,” said Shankar Sastry, former PhD student of Desoer and now Dean of Engineering at UC Berkeley.

I met Charlie in the fall of 1958 when I joined the Department of Electrical Engineering at UC Berkeley as a graduate student and took his upper division course “Linear Systems.” He was an inspiring teacher and encouraged his students to think and solve homework problems using different approaches. I had planned to study computer engineering, but after taking the course with Desoer I switched to circuits and systems and decided to work on my master’s thesis under his supervision. The project involved developing a computer-based approach to design analog filters with lossy inductors and capacitors. Charlie also taught me how to write technical articles—he accepted my thesis after six revisions (it was then published as a paper in the *IEEE Transactions on Circuit Theory* with very little change). According to him, an MS thesis was not to be more than 30 pages and a PhD thesis less than 100 pages.

A much-loved colleague in the Department of Electrical Engineering and Computer Sciences, Charlie was known for his sharp repartee, yet he always had kind words for his colleagues. Former students and junior colleagues remember him for his dedicated mentoring and his strong emphasis on excellence in teaching. Ernest S. Kuh, professor emeritus and a former colleague of Charlie’s at UC Berkeley and Bell Laboratories, recalls: “Charlie Desoer was a true scholar who was dedicated to learning the fundamentals on any subject he encountered and then formulated the problems in an elegant way to solve them. Over the years I learned a lot from him. On teaching, his clarity of thought helped him to present every subject material clearly. His impact on students...
was significant. On writing, I was most fortunate to have coauthored with him two textbooks which greatly influenced professors, researchers, industrial workers, and students all over the world.”

Charlie graduated 42 PhD students, many of whom have established themselves as leaders in their fields in both academia and industry, a testimonial to his inspirational teaching and mentorship. Robert Newcomb, Charlie’s first PhD student and now a professor of electrical and computer engineering at University of Maryland, College Park, wrote: “It was one of the great pleasures of my life to have been a doctoral student of Charles A. Desoer. Fortunately for me Charles wanted to learn about network synthesis, which was the topic I wanted to pursue for my doctorate, having taken courses on the topic under Professors David F. Tuttle at Stanford and Hendryk J. Oorthuys at Purdue. Since Charles had just come from Bell Laboratories he was aware of the papers by Brockway McMillan on n-port synthesis so we met once a week to go through McMillan’s papers, from which I learned of Charles’ scholarly approach to a new topic.”

Frank Callier, professor of mathematics at the University of Namur, Belgium, recalls that “Charlie was very generous to his PhD students, as I experienced firsthand as one of them. Over the years I observed how humble Charlie was in his interactions with others, and how gentlemanly he was in handling even undeserved criticisms, letting time prove him right. I have also become more and more cognizant of his care for students to climb the ladder of learning.”

Shinzo Kodama, former PhD student and professor emeritus of Osaka University, Japan, mentions that Charlie’s ever inquisitive curiosity and strong desire to pursue the essence of a subject and his engineering viewpoint with an extensive mathematical background have continued to influence him and other PhD students long after they left Berkeley. He also says that he “was most impressed by his rare sense concerning the direction of research where significant findings lie. It makes me proud whenever I tell my students that I was one of the students of Professor Desoer.”
Professor M. Vidyasagar of the University of Texas at Dallas observes that, “While Charlie took his own research seriously, he was just as serious encouraging the next generation of researchers. In 1970 I naïvely mailed a copy of a paper to Charlie, requesting his comments. He promptly responded and made several constructive suggestions. It is difficult to imagine, in this day and age, anyone of his stature reading a paper from an unknown person and taking the time to suggest thoughtful comments.” He adds, “It was my privilege to have coauthored a book with Charlie. He had written the bulk of the book by mid-1973 but could not find the time to finish it. So he invited me to spend some time at Berkeley so that we could revise what he had written and write some new chapters. I was just 25 but he treated me as an equal partner in the writing enterprise.”

George Oster, professor of molecular and cell biology at UC Berkeley, remarked that, “Although I wrote but three papers with Charles, the process of writing them taught me one of the most important lessons of my scientific career: How to think clearly and express ideas precisely. The papers were written when I was a postdoc and subsequently a new assistant professor. I had inherited from my physics and engineering training a mode of thinking that Charles considered fuzzy and imprecise—and he was oh, so right! In my subsequent career, however, I fear that I have drifted a considerable way from Charles’s ideal. My excuse has been that biological modeling has not yet reached the precision of physics, or even of engineering. Nevertheless, his lessons always remind me that seeking clarity in writing leads to clarity in thought—not necessarily the other way round.”

Charlie received numerous honors and awards during his career, including a Guggenheim Fellowship (1970), the Medal of the University of Liège (1970), the UC Berkeley Distinguished Teaching Award (1971), the Prix George Montefiore from the Belgian Association of Electrical Engineers (1975), the James H. Mulligan Jr. Education Award from the Institute of Electrical and Electronics Engineers (IEEE; 1975), the American Automatic Control Council Education Award (1983), the IEEE Control
Systems Society Field Award (1986), the UC Berkeley Citation (1991), and the IEEE Gustav Robert Kirchhoff Award (2011) presented posthumously in recognition of his fundamental research in circuits and systems. He received an honorary doctorate degree from the University of Liège in 1976. He was a life fellow of the IEEE, a member of the National Academy of Engineering, and a fellow of the American Association for the Advancement of Science.

Charlie read widely on the history and philosophy of science, economics, and epistemology. And, according to his daughter Michele, he was a connoisseur of fine food and good music and loved to travel.

He is survived by his wife Jacqueline Desoer, of Berkeley, and three children, all in California: Marc Desoer of Thousand Oaks, Michele Desoer of Oakland, and Craig Desoer of Walnut Creek; and two granddaughters. He is also survived by a sister, Monique Bastiné-Desoer, and brother, Jean-François Desoer, as well as several nieces, great-nieces, and great-nephews, all of Belgium.