Born in Munich on 7 August 1936, Dietrich received his *diplom* in mechanical engineering from the Technical University Darmstadt in 1962. He subsequently pursued his doctoral work at TU Berlin under Rudolf Wille, who directed both the university's Hermann Föttinger Institute and DLR. Dietrich, who joined DLR in 1965 as a scientific collaborator, received his PhD in 1968 for his thesis on planar jets deviated by lateral flow. In 1986, TU Berlin awarded him the *habilitation*, and the DLR named him *Seniorwissenschafter* (chief scientist) in 1989.

For nearly 40 years, Dietrich worked at DLR, except for a brief stint at the Max Planck Institut für Strömungsforschung (Max Planck Institute for Fluid Dynamics; renamed the Max Planck Institute for Dynamics and Self-Organization in 2004) in Göttingen in 1971 and a sabbatical in the US at the University of Houston in 1980–81. The photo on page 66 shows him in 2000 next to a remaining section of the Berlin Wall, within which he had lived for 25 years.

Dietrich's remarkable scientific achievements cover acoustics, flow instabilities, turbulence, and biology-inspired fluid mechanics. They include the definitive experimental test (in 1975) of the unsteady Kutta condition at a nozzle lip, followed in the early 1980s by the only fully quantitative experiment on the coupling between an acoustic field and Kelvin–Helmholtz instability waves at the origin of a planar two-stream mixing layer. Beginning in the mid-1970s, he used the directional-microphone-array technique to resolve the question of whether the dominant noise produced by fast trains was aerodynamic in nature or came from the wheels. That research prompted a long-term collaboration on railway noise between DLR and German Rail.

His most widely noted research concerned the drag-reducing properties of shark skin and other structured surfaces. In the late 1980s he built a unique oil channel and a novel differential balance to measure turbulent skin friction to within a fraction of a percent. In the mid-1990s, after years of painstaking improvements to that flow facility, he clarified what large-eddy break-up devices, or LEBUs, do to turbulent boundary layer flows.

Also during the mid-1990s, he optimized the so-called riblet surface—a surface with tiny ridges running in the direction of the flow—and achieved the world record for drag reduction by riblet surfaces: about 10% relative to a smooth surface. Dietrich worked with the 3M Co on a riblet foil that was later used on a prizewinning America's Cup yacht (Cup rules have since barred its use) and tried on commercial airplanes. The foil did lead to substantial fuel savings, but its price and maintenance problems prevented its widespread use.

In later years, Dietrich became convinced that Nature had much to teach engineers; the difficulty was in seeing and understanding what Nature had to offer. Inspired by birds that raise their feathers on the suction side of their wings during a slow-landing approach, Dietrich started a research program on anti-return-current flaps in the late 1990s. That program successfully delayed and stabilized flow separation on a motorized glider plane. He was also closely involved in the German Research Foundation's (DFG's) priority program on control of complex turbulent shear flows.

Dietrich's outstanding scientific achievements have been internationally recognized. In 1986, he won the DFG's Ernst Mach Prize. The first Bionic Prize of the Society for Technical Biology and Bionics, Saarbrücken, and the Association for Bionics, Taufkirchen, was presented to him in 1992. He received the Philip Morris Research Prize in the transport and traffic category in 1998.

After he retired in 2001, Dietrich remained active on the lecture circuit and in the DFG's priority program on flow control. His last major talk was the 2004 Lanchester Lecture "Aerodynamics and Biology" at the Royal Aeronautical Society in London.

You are sorely missed, Dietrich, by your family, your friends, and the fluid mechanics community.

Peter A. Monkewitz
Swiss Federal Institute of Technology
Lausanne, Switzerland

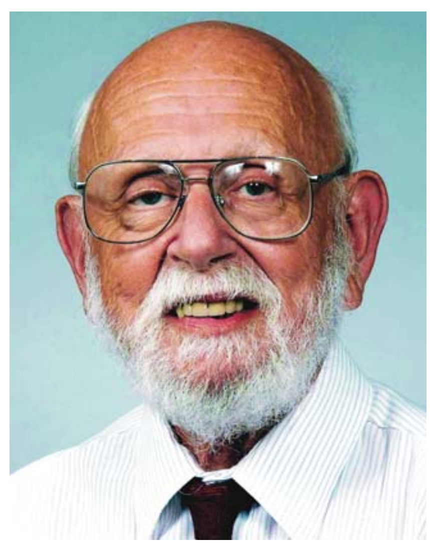
Martin Jacob Berger

Known as the father of electron and proton Monte Carlo methods, Martin Jacob Berger, chief of the radiation theory section of the National Bureau of Standards (now NIST) for more than 20 years, died in Bethesda, Maryland, on 6 November 2004 from the effects of a hematoma after a fall in which he struck his head.

Born in Vienna in 1922, Martin left Austria in 1938 just before its annexation by Nazi Germany. After 18 months in England, he immigrated to the US in 1940 and earned a BS in physics from the University of Chicago three years later. He became a US citizen in 1944, joined the Army, and served in the Aleutian Islands until 1946. Shortly after his discharge, he began his graduate work at the University of Chicago and earned an MS (1948) and a PhD (1951), both in physics. He prepared his doctoral thesis under Marcel Schein on "Multiple Scattering of Fast Protons in Photographic Emulsions" and stayed on for a one-year postdoctoral fellowship in mathematical statistics.

Martin had heard that Ugo Fano and Lew Spencer of NBS had been doing work on ionizing radiation, so he wrote to them, was invited for an interview, and was hired. In September 1952 he joined the radiation theory section, headed by Fano, within the atomic and radiation physics division, led by Lauriston Taylor. Twelve years later Martin became chief of the radiation theory section and was in charge of as many as 12 physicists; he held that position—through various reorganizations and a renaming—until his retirement in 1988.

At NBS in the 1950s, Martin concentrated first on the transport of gamma rays and the development of photon Monte Carlo methods. He pioneered Monte Carlo calculations in complex media and extended them to realistic configurations involving boundaries and inhomogeneities. For the work on photon transport, Martin collaborated with colleagues in the radiation theory section to survey and compile cross-section information. One such colleague was Rosemary McGinnies, who wrote several important early evaluations. In 1960 Martin married Rosemary; they later had three children and six grandchildren. Over the years, Martin retained his interest in photon-interaction cross sections and collaborated on critically evaluated databases that



Martin Jacob Berger

have become a standard for radiation-transport calculations.

Martin shifted his focus to charged-particle transport, with an emphasis on electrons and protons. His 1963 article "Monte Carlo Calculation of the Penetration and Diffusion of Fast Charged Particles," which appeared in *Methods in Computational Physics*, thoroughly delineated the taxonomy, methods, underlying single- and multiple-scattering distributions, and algorithms used in charged-particle Monte Carlo codes. That work was a departure from the few earlier papers done by other authors mostly for calculations of showers in high-energy approximations. In his study, Martin developed a comprehensive approach in which he used the most accurate distributions available to describe the transport of radiation at energies of interest in medical and radiation-protection physics.

With his 1963 paper, Martin literally established the modern Monte Carlo calculation of charged-particle transport. The methods he developed and the cross-section data for which he was largely responsible are imbedded in nearly all of today's coupled photon–charged-particle Monte Carlo codes. The use of electron–photon Monte Carlo calculations are now widespread, and the field has matured so much that scientists in many disciplines now rely heavily on the results of the better-known Monte Carlo codes rather than much more difficult measurements. Perhaps the most telling compliment is that his early pioneering work is still remarkably relevant today, more than 40 years later.

Martin was also responsible for an extensive body of critically evaluated radiation-interaction data. These data were not only necessary for his transport calculations but have become standard reference data for the radiological sciences. They include stopping powers and ranges for electrons, positrons, and heavy charged particles, and cross sections for the bremsstrahlung production by electrons and for the elastic scattering of electrons and positrons.

During his Monte Carlo development work, Martin was also busily applying his methods to important problems in radiological physics. He calculated detector-response functions for radiation spectroscopy; performed microdosimetric calculations; and conducted numerous studies of the absorbed dose and the penetration of photons, electrons, bremsstrahlung, and protons in materials of interest in dosimetry, radiation protection, radiation shielding, auroral physics, and radioactivity standardization. After his retirement, he continued that work as a consultant for NBS and other agencies.

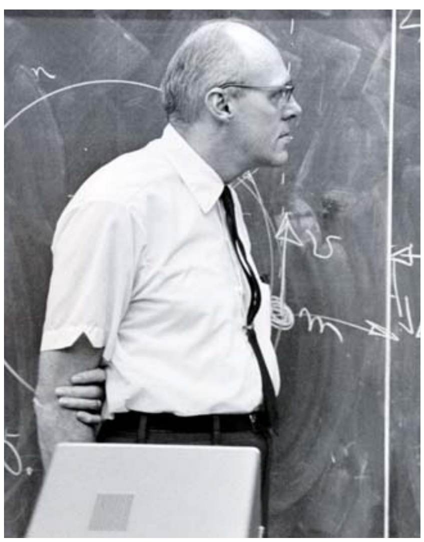
Martin's work was scientifically impeccable. He attacked each problem in his own way, which usually became the standard way. He frequently selected problems that others had not worked on and gave correct, straightforward, and useful solutions. In recognition of his enduring contributions, the International Commission on Radiation Units and Measurements awarded Martin its L. H. Gray Medal in 2003.

The radiological community has lost an important scientist.

Stephen M. Seltzer
National Institute of Standards and Technology
Gaithersburg, Maryland
Mitio Inokuti
Argonne National Laboratory
Argonne, Illinois

Charles Hosea Braden

Charles Hosea Braden, Regents' Professor of Physics Emeritus at the Georgia Institute of Technology, died at his home in Atlanta on 20 November 2004 after a long struggle with a form of cancer unique to asbestos exposure. He had likely been exposed to the substance during ship refitting some 50 years earlier.



Charles Hosea Braden

Charlie was born on 21 March 1926 in Chicago and spent his earliest years in the city. After completing his secondary-school education, and with the outbreak of World War II, he began training with the US Navy and ultimately served from 1943 to 1947 as a training and supply officer with the rank of ensign. His interests in science and engineering started to flower while he was in the service, and it is to the credit of the navy that it assigned Charlie to Columbia University in 1944. He enrolled as a student there and received his BS in engineering in 1946. Through most of 1946–47, the navy assigned him to duty with the supply corps in Boston and the *USS Crescent City* in the Pacific.

After completing his service in the military, Charlie pursued graduate studies in the physics department at Washington University in St. Louis, Missouri, where his skills as a nuclear experimentalist soon became evident. He joined Franklin Shull's group and within two years had collaborated on three papers in the area of beta-ray spectrometry. The Washington University cyclotron provided the focus for his doctoral research. By the time he completed his PhD in 1951, he had not only published his dissertation study on proton–alpha scattering but had collaborated on two other investigations into alpha–alpha and proton–proton scattering.

It has been said that Charlie's arrival at Georgia Tech as assistant professor in the fall of 1951 marked the turning point in establishing a significant research presence in physics at the university. Soon after his arrival, he and several other active young faculty members constructed and equipped an experimental nuclear physics research laboratory, lined up prospective graduate students, and obtained the necessary external support to fund the program. The first paper to come out of that Georgia Tech nuclear collaboration appeared in the *Physical Review* in 1954.

For the next 20 years, the group led by Lemuel David "Dave" Wyly and Charlie was responsible for a series of investigations into nuclear structure through observations of beta and gamma rays from radioactive nuclides. That successful nuclear program led to the creation of additional research areas and ultimately laid the foundation for the current level of research activity within the school of physics.

Howard McMillen, then program director for physics at NSF, invited Charlie to go to Washington, DC, to serve as an associate program director during 1959–60. Charlie and his colleagues in Washington spent most of that year studying the personnel situation in the burgeoning area of high-energy physics. A report of their findings was published in the December 1960 issue of PHYSICS TODAY.

Charlie's contributions, however, were not confined to research. He was