

days consisted of a piece of bicycle tube tightened with twisted 16- or 18-gauge copper wire, or flat glass flanges sealed with liberal quantities of plasticine and oil. Leaks were frequent and disastrous. It occurred to Jack that two ideally smooth parallel plates separated by an ideally smooth circular ring of precisely circular cross section should constitute a perfect vacuum seal. A telephone call to a company in Newcastle in the UK that made neoprene seals of all shapes and sizes for the oil and chemical industry yielded rings that worked perfectly the first time. Thus O-rings were born.

Jack always kicked himself for failing to appreciate Laszlo Tisza's suggestion to him to look for "ondes de température" (temperature waves), now called second sound. Jack's graduate student Ernest Ganz set out to measure the time a heat pulse took to traverse a capillary tube full of helium-II. The velocity turned out to be of order 100 meters per second, the same order of magnitude as second sound. Because pulses were also detected when only a film was present in the capillary, it is possible Jack was on track to find third sound as well. The war began a few months later and put a stop to basic research at Cambridge.

During the war Jack did work on anti-aircraft shells. The Board of Ordnance, which is believed to be the oldest committee in the world, oversaw this work. The board was formed in 1346 to improve English artillery after what was perhaps its first use in the field at the Battle of Crécy. Jack assured me the original members were still sitting.

In 1947, Jack moved to the University of St. Andrews, taking with him a group of fine low-temperature physicists to build up the department there. Among his major accomplishments at St. Andrews was overseeing the design and construction of a new physics building with special amenities for conferences. He served in several administrative posts at the university. His own contributions to research declined there as he approached retirement and his attention turned to matters such as the history of Scottish physicists. Perhaps that change of emphasis has something to do with the startling omission of Jack's name in the awarding of the Nobel Prize in Physics to Kapitza in 1978 for his "basic inventions and discoveries in the area of low-temperature physics." Surely Jack made equally important and basic discoveries in this field.

Jack's life was so varied and colorful, it certainly deserves a full-scale biography. I hope that will happen: Jack kept good records on practically everything.

RUSSELL J. DONNELLY
University of Oregon
Eugene

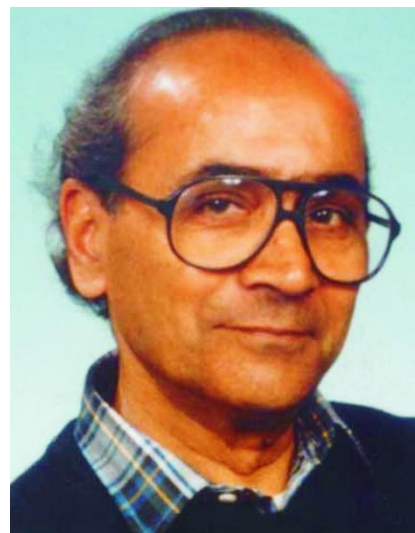
Dilip Kumar Das-Gupta

Dilip Kumar Das-Gupta, an eminent applied physicist in the field of dielectric materials, died on 5 January 2002 in Bangor, Wales, following a brief illness.

Das-Gupta was born on 16 September 1928 in Barisal, India. In 1949, he graduated from the University of Calcutta with a first-class honors BSc degree in physics. That same year, he obtained an MSc degree in radio physics from the university and then subsequently emigrated to England, where he worked as an electronics engineer, research engineer, and deputy chief instrumentation engineer for industrial companies in Cambridge and London until 1960.

From 1955 to 1960, in parallel with his job in industry, Das-Gupta pursued research at the University of London's Birkbeck College, where he earned his PhD in nuclear physics in 1962. From 1960 until 1965, he was a full-time research fellow in Birkbeck's physics department and worked on an absolute determination of internal-conversion electron energies of thorium B (lead-212).

In 1965, Das-Gupta was appointed lecturer at the school of electronic engineering science of the University College of North Wales in Bangor (UCNW). There, he immediately started research on the dynamics and heat transfer in fluidized beds (freely supported solid particles in a fluid). During the 1970s, he began research on the physics of dielectric polymers. Within a few years, he became a leading expert on charge trapping and conduction in insulating polymers and on piezo- and pyroelectric polymers—a new field that had begun only a few years before. In a seminal 1977 paper in *Applied Physics Letters*, he reported changes in the x-ray diffraction patterns of polyvinylidene fluoride caused by corona charging. This work led to the discovery of a new electric-field-induced crystalline phase of this semicrystalline ferroelectric polymer. The findings, as well as his systematic use of corona poling and structure analysis, resulted in seminal publica-



DILIP KUMAR DAS-GUPTA

tions on the link between the morphology and the ferro-, pyro-, and piezoelectricity of polyvinylidene fluoride and its copolymers.

Starting in 1979, Das-Gupta engaged in a series of highly successful research visits to several foreign laboratories. He became a consultant to the department of electrical engineering at the University of Southern California in Los Angeles, where he worked on conduction mechanisms in insulating polymers. During the decades that followed, he collaborated closely with colleagues in Australia, Brazil, Canada, China, Germany, Greece, Hong Kong, Israel, Italy, Portugal, Russia, Spain, and the US. In his collaboration with colleagues from industry, independent laboratories, and universities, and in his own work, Das-Gupta—a true applied physicist—maintained a good balance between the fundamental and engineering aspects of research and technology.

In 1982, Das-Gupta was promoted to reader at UCNW. During 1980, together with one of us (Lang), he introduced the laser intensity modulation method (LIMM), a nondestructive pyroelectric technique for probing space-charge and dipole-polarization distributions in dielectric films. Several laboratories around the world now use this low-cost, high-resolution technique. Das-Gupta continued to refine the LIMM, in particular through careful direct comparisons with related experimental methods.

Das-Gupta's outstanding scientific achievements were acknowledged through many honors. In 1989, he was elected as a fellow of both the UK's Institution of Electrical Engineers and Institute of Physics. In 1994, he was elected a fellow of the Institute of

Electrical and Electronics Engineers.

Das-Gupta formally retired in 1993, but was subsequently appointed honorary research fellow by UCNW (now called the University of Wales in Bangor). He continued and even increased his very fruitful research—in particular, his dedicated work with young talented scientists from all over the world. During the 1990s, he became one of the leading experts on polymer-ceramic composites and contributed often-quoted review articles to journals and books. His advanced materials characterization group at the university's school of informatics continues to study materials for high-energy storage, smart ferroelectric-polymer composite sensors, electrical and dielectric properties of chemically treated polymers, dielectric spectroscopy of polymers and ceramic-polymer composites, and AC-field aging of power cables in humid environments. Das-Gupta's unexpected death left much of this promising research only partly completed.

Das-Gupta consistently supported and encouraged students and young colleagues. For many years, he was involved in a European Socrates/Erasmus network and hosted, in his laboratory, students from all over Europe. His deep understanding of philosophy and culture and his sensitivity for others' feelings and thoughts were as important as his scientific excellence in making him a very successful teacher and promoter of students and scientists worldwide. Many of the students later had the privilege to become his friends and colleagues. Many of them will continue to promote science in research and teaching in his style, and will remember his generous and open personality with fondness.

Das-Gupta had the rare gift of combining scientific excellence and exactness with personal warmth, deep understanding, and a wonderful sense of humor. We all miss him and offer our sympathy to his family.

REIMUND GERHARD-MULTHAUPT

*University of Potsdam
Potsdam, Germany*

SIDNEY B. LANG

*Ben-Gurion University of the Negev
Beer-Sheva, Israel*



JOHN MYRICK DAWSON

from a kidney infection. John also was a professor of physics at UCLA.

John was born in Champaign, Illinois, on 30 September 1930. He received both his degrees in physics from the University of Maryland, College Park: a BS in 1952 and PhD in 1957. His thesis "Distortion of Atoms and Molecules in Dense Media" was prepared under the guidance of Zaka Slawsky.

On graduation, John joined the Princeton Plasma Physics Laboratory. Initially a research physicist, he rose to head the theoretical group from 1966 to 1973. He also spent two years (1969–71) at the Naval Research Laboratory in Washington, DC, where he started a plasma simulation group. He then joined UCLA in 1973 as a professor of physics and subsequently directed the institute for plasma and fusion research from 1989 to 1991.

John was a leading figure in the plasma physics community for more than four decades, with his contributions to science spanning all of plasma physics. He performed seminal work on magnetic fusion, inertial confinement fusion, space plasmas, plasma astrophysics, free-electron lasers, and basic plasma physics. He also proposed numerous controlled-fusion concepts. A visionary, he realized as early as the late 1950s the potential impact of simulations as a way to test both theories and large construction projects before they were built. He used simulations in 1959 to answer such fundamental questions as how large can a plasma wave become before breaking. During the late 1970s and 1980s, John was using simulations to test out new ideas such as plasma-based acceleration. By the 1990s, he was realizing his broader vision for simulations in such projects

as the Numerical Tokamak (see *PHYSICS TODAY*, March 1993, page 64). While others have made pioneering contributions to particle simulations, it was John who developed simulation into a third discipline of research, alongside theory and experiment, by showing how powerful a tool it could be.

In the late 1970s and 1980s, while at UCLA, John pioneered the field of plasma-based acceleration. He proposed letting particles surf on the plasma-wave wakes left behind by a laser or a particle beam as it moved through plasma. The fields in these wakes can be more than 1000 times higher than in conventional accelerators. He took great satisfaction in recent experimental successes of plasma-based accelerators and their potential for being greatly miniaturized in the future.

John mentored several generations of plasma physicists and touched countless others with his generously shared insight, bounty of new ideas, and encouragement. Tudor Johnston, a colleague and collaborator of John's from the Institut National de la Recherche Scientifique in Canada, remarked, "It was as if, among the cards lying face down on the table, he knew exactly which cards to choose to play the best hand. Many people with great talent cause discomfort to the less brilliant people around them. Not John, who had such a transparent and kindly nature that I've never met anyone who had a bad word to say of him." A true humanitarian, John believed that science was still the most noble of professions. He believed strongly in the importance of controlled nuclear-fusion research and was particularly proud of his invention of an isotope separation process that was used to detect cancer and, consequently, help save many lives.

John received the James Clerk Maxwell Prize for Plasma Physics in 1977 and the Aneesur Rahman Prize for Computational Physics in 1994; both are the highest honors bestowed by the American Physical Society's plasma physics and computational physics divisions, respectively. He was named California Scientist of the Year by the California Science Center in 1978.

John had successfully overcome life-threatening illnesses several times. Shortly before his death, he had been in improving health and had enjoyed attending APS's division of plasma physics meeting in Long Beach, California. Many attendees may have seen him there, running

John Myrick Dawson

John Myrick Dawson, who is considered the father of plasma-based accelerators and of computer simulation of plasmas, died in his sleep on 17 November 2001 in Santa Monica, California. He had been suffering