

became a full professor in 1959. A year later, he was directing the university's laboratory of atomic and solid-state physics (LASSP). He was not only instrumental in the actual design of LASSP and its staffing, but during his four-year tenure as director helped mentor it through its golden era that was capped by its remarkable impact on physics work done during the 1970s that led to Nobel Prizes in the 1980s and 1990s. In 1981, Jim was named Cornell's Horace White Professor of Physics.

Intertwined with Jim's academic career were several important government and industrial positions. During 1954–59, he was a member of various advisory committees for the US Atomic Energy Commission and concurrently was briefly the associate director of corporate research of National Carbon–Union Carbide Corp (1954–56). Jim took pride in cofounding, with Robb Thompson, the Materials Research Council for the Department of Defense's Advanced Research Projects Agency around 1960. Jim was a senior fellow of Los Alamos National Laboratory (1975–79). Most notably, he was the assistant director for mathematics, physical sciences, and engineering for NSF from 1977 to 1979. For that tenure, he received the foundation's distinguished service award for program development in microscience and computer systems. During that same period, he was a member of the board of directors of Allied Chemical Corp. He also spent many years on Allied's science advisory board (1979–87).

Jim's service to the physics community was equally impressive. He was the editor of the *Journal of Applied Physics* (1958–64), an associate editor of *Solid State Communications* (1963–70), and an associate editor of *Reviews of Modern Physics* (1968–73). From 1974 to 1977, he was the editor of *Physical Review Letters* and transformed many of its structures and procedures into those still used today. In 1989, he began his post as president of the American Physical Society. As president in the years following the massacre at Tiananmen Square, he became well known for his support of visa and immigration reforms for Chinese students, postdoctoral associates, and visiting scholars. He also helped usher the move of APS headquarters from New York to College Park, Maryland.

Never one to shy away from taking strong principled stands on major scientific issues, Jim testified before Congress in 1987 against the con-

struction of the Superconducting Super Collider because its expense would divert funding from many other important and promising areas of research. He also was a proponent of human rights. In addition to supporting Chinese scholars, for example, he also vehemently opposed the imprisonment, without any charges filed, of an Argentine physicist in Argentina during 1975–77.

Jim characterized his own research style as that of a gadfly. Peripatetic would be more fitting. Through his scientific endeavors, he traveled through communication and information theory, applied mathematics, theoretical condensed matter physics, materials science, nonlinear physics, statistical mechanics, and biophysics. He had a special talent for seeing the connections between fields and linking workers across those fields. For example, he advocated the notion of phonons to metallurgists and, with Robert Schrieffer, the concept of solitons to materials scientists. His contributions (with Schrieffer) to the statistical mechanics of structural phase transitions and (with Gerhard Barsch) to martensitic twinning without dislocations are particularly noteworthy. He had a strong belief in the inherent unity in science. Accordingly, he was an advocate of broader training for physicists. Cornell established in 2004 the J. A. Krumhansl Postdoctoral Fellowship, which, very much in line with Jim's style, offers an independent and unrestricted choice of theoretical research directions for the selected candidate.

Jim remained on the Cornell faculty until his retirement in 1990, and then held adjunct professorships at the University of Massachusetts Amherst and at Dartmouth College. One month before his death, he delivered his last invited lecture, on multiscale modeling of materials and biological matter, at the Dynamic Energy Landscapes and Functional Systems Conference in Santa Fe, New Mexico. A memorial symposium was held at Los Alamos in January 2005 to thank him for his service to the laboratory and to celebrate his remarkable life and its impact on physics and science policy. He is remembered by his students, postdoctoral associates, colleagues, and collaborators for his quick mind, humor, and unlimited energy.

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Gustav Konrad Medicus

Gustav Konrad Medicus, who had a long and illustrious career at the organizational predecessors to the present Air Force Research Laboratory at Wright–Patterson Air Force Base (WPAFB) in Dayton, Ohio, died of heart failure on 6 June 2004 at his residence in Spencer, Indiana. His talents covered the scientific spectrum from highly innovative laboratory vacuum and electronics techniques, to sophisticated theory on how patchiness in the metallic-surface work function affects probe measurements, to an explanation of the exceptionally low-voltage “ball-of-fire discharge.”

Born on 28 April 1906 in Augsburg, Germany, Medicus received his MS and PhD in technical physics in 1933 and 1935, respectively, from the Technical University in Munich. Apart from a year with the R. Bosch Co in Stuttgart in 1936, he performed research and lectured at the TUM, and became an associate professor in 1947. He worked in the “electrophysics” department of Winfried Schumann.

At the Bosch Co, Medicus investigated metallized paper capacitors and designed and constructed secondary-emission multipliers. After he returned to the TUM, his work expanded to include the corona discharge, Geiger counters, and polarization by reflection. He immigrated to the US in 1949 under Operation Paper Clip, a US Department of Defense program to bring talented German and other European scientists to work in the US following World War II.

Medicus became a member of WPAFB's advanced electronic devices branch in the electronic technology division of the Wright Air Development Center. He conducted research on low-voltage arc tubes, especially by means of Langmuir-probe measurements, and investigated some of the original approaches to thermionic energy conversion. He worked with Gottfried Wehner to produce some of the first reliable quantitative data for cathodic sputtering by low-energy ion bombardment. In 1962, Medicus became a senior scientist in the newly organized avionics laboratory at WPAFB.

Medicus is renowned for his development, in 1964, of a system for the automatic plotting of Langmuir-probe curves. His research team introduced the electronic second-derivative system, which measures the energy-distribution function of the plasma electrons. Their work made the sys-



Gustav Konrad Medicus

tem a versatile and more useful diagnostic measurement tool that is still used today in plasma dry-processing for microelectronics. In 1966, he introduced the guard-ring probe and a number of novel techniques for economically fabricating miniature spherical probes. His other accomplishments include making several improvements in gas lasers, developing ultrahigh-vacuum gas valves, inventing matrix-cathode material that is shapeable by plastic deformation, and creating an excenter mill (replacement for a ball mill). He received patents for all of those achievements.

An internationally acclaimed researcher, Medicus was invited to lecture at many of the International Conferences on Ionization Phenomena in Gases and at prominent universities in the US and overseas. He produced numerous publications during his career.

In recognition of his research excellence and his contributions to the air force, Medicus was granted, in 1962, a public-law appointment, one

of the highest-level civil-service positions in the US government. During his civil-service career, he received many awards, including the Air Force Scientific Achievement Award in 1962 and the Air Force Systems Command Certificate of Merit in 1970.

After Medicus retired in 1977, he remained active in his field and consulted for Systems Research Laboratories in Dayton, Ohio. During those years, he also pursued his lifelong interests in the flora and fauna of exotic places. He traveled extensively with his daughter Berta and visited such places as South Africa, Costa Rica, and Madagascar. His colleagues and friends miss his excited accounts of those experiences.

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MIKKO BERGROTH



Martti Mikael Salomaa

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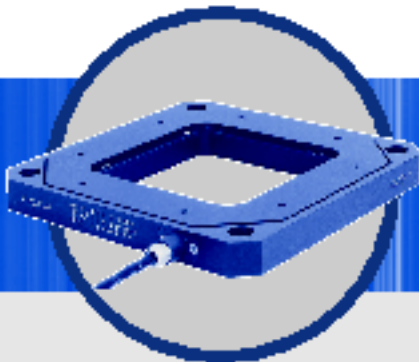
Martti Mikael Salomaa, a professor of theoretical materials physics at the Helsinki University of Technology (TKK), died of natural causes on 9 December 2004. He contributed to many areas of condensed matter theory, including superfluid helium-3, Bose-Einstein condensation (BEC) of alkali atoms, superconductivity, quantum computing, and acoustic-wave propagation in solids.

Salomaa was born on 6 October 1949 in Kotka, Finland. He was one of two Finn students who were the first to receive a scholarship to study at Atlantic College in Glamorgan, Wales. He completed his secondary education at Atlantic, where his lifelong love for the sea and sailing began. His successfully designed high-speed lifeboat for a student project was one of his proudest accomplishments. Building was a passion, and his final years of

life were enlivened by the construction he and his wife, Margaretha, undertook of a summer cabin on an island in the Baltic.

Salomaa took his undergraduate and graduate degrees at TKK, where he received his Licentiate of Technology degree in 1974 and his PhD in 1979. Building on earlier work on normal ^3He , his thesis, which was carried out under adviser Christopher Pethick and in collaboration with Gordon Baym, laid the foundation for the theory of the mobility of negative ions and electrons in the superfluid phase. That work fitted squarely into the ultralow-temperature experimental program at TKK's Low Temperature Laboratory.

After spending time as a postdoc first at UCLA and then at the University of Virginia in Charlottesville, Salomaa returned to Helsinki in 1982 to become director of the Low Temperature Laboratory's theory group. The next period of his career saw the elucidation of vortex structures in rotating ^3He . Salomaa, with Grigory



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