

physicists and those his age wanted to imitate. He showed that it was possible to have an excellent school of theoretical physics in Italy, as demonstrated by the accomplishments of his students and younger collaborators, including Maiani, Roberto Petronzio, Guido Martinelli, and me.

Cabibbo liked making objects by hand—for example, the mirror of an amateur reflecting telescope—not only for their possible use but also for the pleasure of crafting something well. He had always been a talented photographer, and in the digital era he would spend long afternoons improving the quality of a single photo. When I visited Cabibbo at home last July during his illness, I noticed on the walls large abstract pictures with strong, round spots of pure colors. I expressed my appreciation and asked who the artist was, and he said happily, “I made them.” He explained to me, with plenty of technical details, how he developed a technique to transform his digital photos and create such impressive images of sheer beauty.

Cabibbo had an infectious enthusiasm for physics. He was a born problem solver; to him, physics was a kind of play, like putting together the pieces of a puzzle to form a meaningful pattern from an incoherent data set. I will always remember him saying, “Why should we study this problem if we do not amuse ourselves in solving it?”

Giorgio Parisi

University of Rome I (“La Sapienza”)

George Samuel Hurst

George Samuel Hurst, a world-acclaimed scientist, inventor, and entrepreneur, passed away in Oak Ridge, Tennessee, on 4 July 2010 from a brain aneurysm.

Born 13 October 1927 in Ponza, Kentucky, Sam enrolled in Berea College at the age of 15 and graduated with a degree in physics in 1947. The following year he earned an MS degree in physics from the University of Kentucky. Sam then began a distinguished career spanning 40 years at Oak Ridge National Laboratory.

In Sam’s early years at ORNL, he was asked by Karl Morgan to perform research in the emerging field of health physics, where Sam made numerous contributions in radiation detection. He formulated the generalized concept of radiation dosimetry and was the first to apply the proportional counter technique to the measurement of neutron fluxes and the radiation dose absorbed

in tissue. The “Hurst fast neutron counter” became a standard instrument in early nuclear programs around the world.

In the 1950s Sam frequently traveled to Japan with a team of scientists to document latent radiation-related disease effects and mortality rates of the atomic bomb survivors. His desire to understand the radiation-matter relationship led him to study the energy pathways involved with it. He studied ionization and emission, atomic lifetimes, atomic collisions, radiation trapping, and the like, all properly measured to account for the various paths along which the energy could be dissipated. Those studies led naturally to his interest in atomic, molecular, and optical physics, where he made many important contributions to the understanding of electron transport and electron attachment in gas-phase atoms and molecules. Of particular importance was his work on novel methods to determine both the transverse and longitudinal electron transport properties of electrons in gases.

Sam earned his PhD in physics in 1959 at the University of Tennessee; his dissertation, “Capture of Electrons in Molecular Oxygen,” was done with Richard Present as his adviser. In 1966 Sam returned to the University of Kentucky to continue his fundamental studies of atomic and molecular physics. During that time he and his students confronted the problem of analyzing large amounts of data on strip chart recorders. They devised an electronic system capable of quickly and accurately graphing the data coordinates. Sam recognized the importance of the discovery at a time when computers were in their infancy and started a company in Oak Ridge to make use of his invention. Elographics Inc was devoted to developing and marketing the new technology, now known as the touchscreen.

Sam returned to ORNL in the 1970s and headed a group to study laser-based methods of ultrasensitive detection of single atoms or molecules, an area he called one-atom detection. He and collaborators Marvin Payne, Steve Kramer, and Jack Young wrote a highly cited *Review of Modern Physics* article called “Resonance Ionization Spectroscopy and One-Atom Detection” (volume 51, page 767, 1979). As an outgrowth of that work, Sam founded Atom Sciences Inc in Oak Ridge to facilitate new applications of that area of science. He also established the Institute of Resonance Ionization Spectroscopy at the University of Tennessee to serve as an academic home for the technology.



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From 1985 through 2001, the institute conducted biennial symposia and bestowed graduate student awards to promote the research internationally.

Sam’s love for his native Appalachia inspired him to stimulate the growth and development of clean scientific technologies in the region. In the mid 1960s, he established an organization called Scientists and Engineers for Appalachia. Sam was the founder or cofounder of five companies in eastern Tennessee and provided hundreds of jobs for the area.

Over his scientific career, Sam held 30 patents and was author or coauthor of more than 200 refereed publications and books. In retirement, he was especially interested in the confluence of science and religion. Together with longtime friend and noted scientist Rufus Ritchie, father of surface plasmonics, he began a series of lectures in Oak Ridge called the Forum on Religion and Science, which promotes tolerance and understanding among believers of all faiths and nonbelievers alike.

Sam had a generous spirit and gave freely of his time, encouragement, and ideas. His personality, much admired by his colleagues and friends, was best summed up by his friend Fletcher Gabbard: “Sam Hurst is a gentle man with a quiet and efficient manner. He is an irrepressible optimist and a delightful companion. Quiet and unassuming in his relationships, Sam brings out the best in fellow workers through congenial and encouraging direction. His criticism is gentle, his sense of direction is strong, and his praise filled with good will.”

Robert N. Compton

James E. Parks

University of Tennessee, Knoxville ■