nuclear weapons had saved in excess of one million lives by avoiding an invasion of Japan. More than 10 years ago, he argued that nuclear testing was no longer necessary to ensure the safety and reliability of nuclear weapon stockpiles. This view, at first quite unpopular, has now prevailed in almost all sectors of our society. It is a fitting tribute to one of the great among us.

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Andrey Stanislavovich Borovik-Romanov

Andrey Stanislavovich Borovik-Romanov, a distinguished Russian physicist, died on 31 July 1997 in Cairns, Australia.

Andrey was born on 18 March 1920 in Leningrad. He began studying physics at Moscow State University in 1938, but his education was interrupted when he joined the Soviet army in World War II.

After the war, he returned to his studies and received a diploma in physics (the equivalent of a master's degree) in 1947. He then joined the Institute of Metrology in Moscow, where he spent several years, earning his candidate's degree (the equivalent of a PhD) there in 1950.

In 1956, Andrey was invited by Peter Kapitza to join the Institute for Physical Problems (now known as the Kapitza Institute for Physical Problems). Andrey spent the remainder of his career—and certainly the most fruitful part of his professional life—at the institute, serving as vice director (1963–84) and director (1984–91). After 1991, he continued to work at the institute.

A. S. BOROVIK-ROMANOV

Andrey will be remembered most for his research in the fields of magnetism and low-temperature physics. He first worked on the static magnetic properties of antiferromagnets in 1955. He discovered weak ferromagnetism in antiferromagnets in 1956 and suggested that the phenomenon could be explained by the noncollinearity of spins. That idea stimulated intense theoretical studies, which finally resulted in a comprehensive theory of weak ferromagnetism.

Andrey also observed piezomagnetism in some of the antiferromagnets in 1959 and investigated their spin dynamics. In particular, he generalized the theory of spin waves for weak ferromagnets, calculated and measured spin-wave spectra in particular kinds of antiferromagnets and observed the parametric excitation of spin waves in antiferromagnets in 1969.

In 1973, he also undertook magneto-optical studies of antiferromagnets and later observed inelastic scattering of light by spin waves and phonons. For these important contributions to the physics of magnetism, Andrey received the Lomonosov Prize from the USSR Academy of Sciences in 1972, the same year he was elected to membership in the academy.

At the end of the 1970s, Andrey changed his area of research. He initiated the construction of the first nuclear demagnetization cryostat in the USSR for studies of quantum liquids at superlow temperatures and became the leader of a research group that, in 1982, began nuclear magnetic resonance studies of superfluid helium-3. Although a full decade had passed since the discovery of superfluid ^{3}He, Andrey and his research group still obtained a number of exciting new results concerning the spin dynamics of superfluid ^{3}He. Their results included the macroscopic transport of spin due to spin supercurrents, spin analogs of the Josephson phenomena and phase slips and a new dynamical homogeneously precessing domain maintained by spin supercurrents. Andrey's group demonstrated that all these effects, although occurring in a spin system, have deep connections with superconductivity and superfluidity. For this work, Andrey was awarded the Russian State Prize in 1993.

Andrey was an outstanding physicist, as well as a great educator and organizer. He gave lectures at the Moscow Institute of Physics and Technology and was a mentor for many students. Until the end, he worked as an editor of the principal Russian physical journal, *Journal of Experimental and Theoretical Physics*. He was the founder of *JETP Letters*.

Although Andrey often called himself a lucky man, his luck was really the result of hard work and optimism, which helped him to overcome many difficulties. He was a good man, and his honesty, kindness and politeness were an example to all of us. He is missed and will be remembered by colleagues all over the world.

ALEXANDER F. ANDREEV
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Albert Louis Latter

Albert Louis Latter, one of the most influential scientists within the US defense establishment for more than 30 years, died at his home in Pacific Palisades, California, on 8 June 1997. He was 76.

Born in Kokomo, Indiana, Latter earned a BA at UCLA in 1941. Ten years later, at a time when the fields of nuclear energy and nuclear explosives were under rapid development and growth, he earned his PhD—also at UCLA—in nuclear physics, after which he immediately left to join the Rand Corp in Santa Monica, California.

For the next 20 years, he worked on many aspects of nuclear weapons, their effects and the weapons systems that employed them or were meant to survive them. Shortly after joining Rand, he, along with several other Rand physicists, participated in the establishment of the Atomic Energy Commission's laboratory at Livermore, California (later to become Lawrence Livermore National Laboratory). Over the next three decades, Latter worked with many of the lab's leaders and was credited with a number of nuclear weapons concepts, which he was also instrumental in developing.

In 1960, Latter was named head of the physics department at Rand, where he was active in designing and planning the basing of US intercontinental ballistic missiles (ICBMs), with emphasis on their surviving nuclear attacks on their silos. Latter contributed to the understanding of sophisticated warheads for missiles, particularly those known as MIRVs (multiple independently targeted reentry vehicles) for use against hardened ICBM bases and antiballistic missile (ABM) defenses.

Concerned about the possible hiding or muffling of nuclear tests, Latter led a Rand team that studied the issue. The summary of their report, which appeared in 1959, began: "It is shown theoretically that nuclear explosions can be effectively hidden in large underground cavities. An estimate of the effectiveness of the method indicates that a yield of more than 300 kilotons could be made to look seismically like a yield of 1 kiloton." The consequent attention paid to the details of seismically detecting blasts whose true power was surreptitiously decoupled from their detectable power led eventually to the limited test ban treaty of 1963.

Latter was the first to point out the significance of x-ray emissions from highly efficient nuclear weapons when detonated above the atmosphere. Such x-ray emissions became of vital concern to ABM systems and efforts to circumvent missile defense systems.

Latter wrote or cowrote more than 70 papers dealing with issues of importance to national defense and nuclear defense systems. In 1958, he and Edward Teller wrote the book *Our Nuclear Future: Facts, Dangers and Opportunities* (Criterion Books) in which they argued strongly for nuclear weapons testing and noted that a determined Soviet Union could hide its tests so that detection from the outside would be improbable.

He left Rand in 1971 to found his own defense research concern, R&D Associates, from which he retired in 1975.

Throughout his professional career, Latter was an imaginative and energetic problem solver. His role as an adviser to several defense institutions was frequently augmented by his less formal interactions with decision-makers in the Departments of Energy and Defense. He preferred to work with others rather than alone, which fitted well with his dual roles as an administrator and researcher. His relentless and lengthy pursuit of an interesting subject or unsolved problem often exhausted his fellow workers, but he seldom abandoned a matter until he understood it well enough to be bored with his own explorations. His strength of character was often hidden behind a gentle and courteous manner.

Harold L. Brode
Pacific-Sierra Research Corp
Santa Monica, California

Joseph Melvin Reynolds

Joseph Melvin Reynolds, Boyd Professor of Physics Emeritus at Louisiana State University, died on 11 June 1997 in Baton Rouge after an extended fight with Alzheimer's disease.

Joe was born on 16 July 1924 in Woodlawn, Tennessee. He graduated from Vanderbilt University in 1946 and then went to graduate school at Yale University, where he received his PhD in physics in 1950 under the direction of Cecil Lane. During his graduate school years, Joe also taught for a year at Connecticut College.

He joined LSU's physics department in 1950 and installed one of the first Collins helium liquifiers in the US. Working in a department whose research program was just beginning, he obtained some of the first experimental results on transport in low-temperature metals. Those experiments established the reputation of his laboratory, and he became one of the first scientists to receive a grant from the new National Science Foundation.

His experimental achievements included the first observation of Landau quantum oscillations (LQO) in the Hall effect (with Claude Grenier), the first direct measurement of the added mass due to the flow of the superfluid component of helium-4 (with Bill Good and Robert Hussey) and the detection of LQO in the Knight shift (with Roy Goodrich). And until his (by then) ancient helium liquifier died, he was in a close competition with Bascom Deaver and his Yale classmate William Fairbank to be the first to measure the superconducting flux quantum.

As a result of spending a sabbatical year at Stanford University, Joe helped establish the gravitational radiation detection program at LSU in 1970. He maintained an interest in gravitation experiments as long as his illness would allow him.

He served as head of the department of physics and astronomy from 1962 to 1965.

In 1966, President Lyndon Johnson appointed him to the National Science Board, on which he served for two terms. He also sat on the Naval Studies Board and on the National Academy of Sciences' Space Science Board. He participated in the Space Science Board's 1984 study *Major Directions of Space Science* and headed the task force that produced the report *Scientific Uses of the Space Station* for NASA in 1984. He also helped to initiate the space station's microgravity program and strongly supported the Schiff–Everitt experiment, which later developed into Gravity Probe B.

The LSU community especially appreciated Joe's leadership when, shortly after becoming vice president of the LSU system in 1968, he became the principal LSU coordinator for the desegregation program between Southern University and LSU. The 1950s were a difficult time in the deep South, and Joe had been one of the few who, when offered other positions, opted to stay and fight for academic integrity. That action gave him a great deal of political credibility and allowed him to work for cooperative programs that have benefited both institutions.

In addition to his lifelong commitment to physics and the academic community, Joe was an avid sailor. Most of the old-timers in low-temperature physics recall weekends spent with Joe and his family on their boat, *Lambda Point*, sailing on Lake Ponchartrain or occasionally out into the Gulf of Mexico. Joe also loved the guitar and had a good voice for a wide repertoire of folk music.

Roy G. Goodrich
William O. Hamilton
Louisiana State University
Baton Rouge, Louisiana

Karl Gunther Kessler

Karl Gunther Kessler, a leader in physics and metrology at what is now the National Institute of Standards and Technology (NIST), died of a heart attack in Bethesda, Maryland, on 7 July 1997. He was 77.

Kessler was born in Germany and emigrated to the US with his family in 1926. He did undergraduate as well as graduate work at the University of Michigan, where he earned his PhD in physics in 1947. He then joined the staff at the National Bureau of Standards (NBS), which later became NIST. His early research in optical spectroscopy involved energy-level analyses of complex atomic spectra, and he pioneered the use of electronic computers to unravel some of these structures. Subsequently, he turned to optical metrology, which remained his main research interest for the rest of his career.

Working with William F. Meggers from 1948 to 1950, Kessler made high-precision measurements of wavelengths of mercury-198, and demonstrated the superiority of this source over the existing wavelength standard, a discharge in cadmium-114.

In the late 1950s, Kessler developed an atomic beam as a light source of unprecedented wavelength precision, and took advantage of its low Doppler broadening to produce extremely sharp spectral lines. Unfortunately, the technique proved to be too advanced for easy transfer to other standards laboratories at the time.

With Gary Schweitzer, Kessler also invented a Zeeman filter that provided a simple method for narrowing the 253.7 nm line from a conventional mercury lamp to a width comparable to that from a beam source.

In 1959, he became chief of the spectroscopy section at NBS, where he fostered research in the increasingly important ultraviolet region and in the accurate determination of atomic transition probabilities, which are vital for