

we hear that

Lawrence Awards for contributions to atomic energy

The Department of Energy has selected Martin Blume (Brookhaven National Laboratory), Yuan T. Lee (University of California, Berkeley), Fred R. Mynatt (Oak Ridge National Laboratory), Paul B. Selby (Oak Ridge), and Lowell L. Wood (Lawrence Livermore National Laboratory) to receive the Ernest Orlando Lawrence Memorial Award for outstanding contributions in the field of atomic energy. This award, presented annually by the DOE since 1959, includes a medal, a citation and a \$5000 prize for each recipient.

Blume was cited "for his definitive contributions to the theoretical analysis of magnetic phenomena in neutron scattering, for his work on relaxation and critical phenomena, and for his scientific leadership in solid state physics, especially for the emerging program based on the National Synchrotron Light Source."

After graduating from Princeton University, Blume obtained his PhD from Harvard University in 1959. He was a Fulbright fellow at the University of Tokyo from 1959 to 1960 and worked for the Atomic Energy Research Establishment in Harwell, England, from 1960 to 1962. He joined the staff at Brookhaven in 1962 as an associate physicist and is now a senior physicist there; also, since 1979 he has headed the National Synchrotron Light Source.

Blume's experiments in neutron scattering yielded information with far-reaching implications for our fundamental understanding of the solid state. He developed a systematic theory of the scattering of polarized neutron beams from magnetic crystals that included considerations of the interference effects in nuclear, magnetic and spin-orbit scattering. In addition, he and his co-workers measured and calculated the magnetic form factors of rare-earth elements. Blume has also been interested in the general theory of relaxation effects of spin systems in condensed matter. This interest led to his contributions to the understanding of how relaxation effects relate to the Mössbauer effect and perturbed angular correlations. Blume was also instrumental in the design and eventual



Lawrence Award winners from left to right: Martin Blume (Brookhaven), Yuan T. Lee (Berkeley), Fred Mynatt (Oak Ridge), Paul Selby (Oak Ridge) and Lowell Wood (Livermore).

development of the National Synchrotron Light Source.

The DOE recognized Lee for "his outstanding fundamental research contributions to chemical dynamics, with applications to laser dynamics and development, isotope separation, atmospheric chemistry and combustion."

Lee obtained his PhD in chemistry from the University of California, Berkeley, in 1965, and continued post-doctoral work there until 1967. He was a research fellow at Harvard University from 1967 to 1968, at which time he joined the faculty at the University of Chicago. In 1974 he left Chicago to return to Berkeley, where he is now professor of chemistry. Simultaneously, Lee also serves as the principal investigator for the Materials and Molecular Research Division of the Lawrence Berkeley Laboratory.

Lee's research interests have spanned the entire field of chemical dynamics. He is particularly noted for his definitive studies of noble-gas elastic scattering; the intermolecular potentials derived from these studies serve as the standard of comparison for quantum calculations and further experimentation. Lee has also used crossed molecular beams to evaluate the potential-energy function between

pairs of various atoms and molecules. Lee, in collaboration with Y. R. Shen, also at Berkeley, was the first to demonstrate directly the collisionless multiphoton dissociation of polyatomic molecules. They used a crossed laser beam and molecular beam to measure the translational energy distribution of fragments of SF_6 that dissociated. This method was later used to study the multiphoton decomposition of a variety of molecules, confirming the validity of statistical models for collisionless unimolecular dissociation, and permitting a stepwise approach to elucidate the activation of the molecule. Lee and Shen's work has made a substantial contribution to further research and to the laser isotope-separation programs that are based upon this research.

Mynatt receives the award for "the development of... discrete ordinate methods and... generalized perturbation theory for radiation shielding analysis and for leadership in the broad application of these methods to create safe and efficient shield designs."

Since 1961 Mynatt has been associated with Oak Ridge, where he is currently director of the instruments and controls division. He received his PhD in 1969, from the University of Tennessee, in nuclear engineering.

Mynatt and his coworkers have led in the development of computer codes for problems in radiation shielding for nuclear reactors. These codes, together with Monte Carlo and other techniques, now form the basis for the design of radiation shields throughout the world.

The citation for Selby's award recognizes his "development of a series of radiation-induced dominant skeletal mutations in the mouse that have important applications for the determination of risk estimates of low-level radiation exposure."

After receiving his PhD in biomedical science from the University of Tennessee in 1972, Selby spent three years at the Gesellschaft für Strahlen- und Umweltforschung in Neuherberg, West Germany. In 1975 he joined Oak Ridge, where he now is a research associate in the biology division.

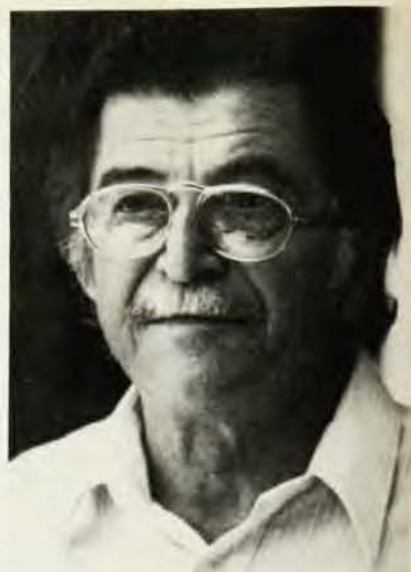
Selby's work, in providing a direct measure of the rate at which dominant mutations are induced in mammalian skeletal tissue, has contributed significantly to our understanding of genetic effects of ionizing radiation. Selby has also participated in the development of radiation-protection criteria for humans, and has contributed other studies on somatic and genetic effects of radiation.

Wood was honored for "his outstanding contributions to national security

in the areas of directed energy, inertial confinement fusion, underwater communications, nuclear weapon design concepts and computer technology."

In 1965 Wood received his PhD in astrophysics from the University of California, Los Angeles, where he remained as a teacher until 1972. During this period he also served on the staff at the University of California, Davis. He joined the staff of the Lawrence Livermore National Laboratory in 1966, and is now the special-studies group leader for the physics department.

Throughout his career at Livermore, Wood has contributed to the advancement of applied science as it relates to national-defense technology and to the training and recruitment of young scientists to work in defense research. In collaboration with others, Wood initiated research, including preliminary experimentation, that was necessary to develop one form of directed energy. In 1969 he and John H. Nuckolls proposed using high-power lasers to ignite thermonuclear reactions. Wood has also made significant contributions, with J. Marling, to the development of ultrasensitive isotropic blue-green light detectors for strategic communications. He has also done substantial work in the area of computer development, especially in the area of rapid, largely automated, hierarchical design of supercomputers.



RUDNICK

um, provided experimental confirmation of a theoretical prediction as well as detailed definitive measurements. Rudnick has also studied third, second and zero sound as part of his investigations in low-temperature physics. His work, for example, led to a simple physical understanding of zero sound in terms of the behavior of an ideal viscoelastic liquid. In addition, his guidance as a teacher and inventor has advanced the field of acoustics through the contributions of his many students.

The biennial award of the Acoustical Society of America honors a member, under 35 years of age, who has contributed substantially to the advancement of acoustics through papers published during the two or more years prior to receiving the award. Baer is recognized "for important contributions toward a better understanding of the propagation of sound in the ocean and, in particular, the effects of Rossby waves and eddies."

Baer specialized in applied mathematics and received his PhD in 1974 from Rensselaer Polytechnic Institute. He served as a research assistant under an Office of Naval Research contract from 1971 to 1974, studying underwater environmental acoustics. In 1974, he joined the Acoustics Division at The Naval Research Laboratory, where he is now head of the Stochastic Propagation Section of the Large Aperture Acoustics Branch.

His research accomplishments were attributed by the awards committee to "an uncommon ability to meld physics, mathematics, and computing." Baer's published research includes using geophysical fluid dynamics to determine the effects of an assumed Rossby wave on sound speed in the ocean, and the subsequent application of these results to studies of sound propagation through a Rossby wave.

Acoustical awards to Rudnick and Baer

The Acoustical Society of America has presented a gold medal to Isadore Rudnick of the University of California, Los Angeles, and its biennial service award to Ralph N. Baer of The Naval Research Laboratory.

The gold medal, given annually to

BAER



recognize contributions to acoustics, was presented to Rudnick "For his ingenious and masterly contributions to acoustical research and teaching, and for his distinguished leadership and service to the Society."

Rudnick received his PhD from the University of California, Los Angeles, in 1944. He served as a research physicist at Brown University from 1942 to 1945. He went on to teach physics at Pennsylvania State College from 1945 to 1948. In 1948 he joined the faculty of the University of California, Los Angeles, where he is now a professor of physics. During his career at the University of California he has served as a visiting professor at the Royal Institute of Technology in Copenhagen, The Israel Institute of Technology, The University of Paris and the University of Tokyo.

His research interests have included ultrasonics, high-intensity acoustics, cavitation, elastic-wave damping in metals and other nonlinear phenomena. In the 1960s he began to work on low-temperature physics and quantum liquids. His discovery of fourth sound, a propagating acoustic wave of superfluid in a tightly packed porous medi-