at Oak Ridge National Laboratory, has been named a senior corporate fellow of Martin Marietta Energy Systems, a subsidiary of Martin Marietta Corporation that manages ORNL and three other government-owned facilities for the Department of Energy.

OBITUARIES

Theodore N. Sarachman

Theodore N. Sarachman, chairman of the physics department at Whittier College and a visiting professor of physics at Caltech, died of leukemia on 2 April 1987 at age 55.

He earned his AB and MS at the University of Chicago, and in 1961 he received his PhD in physical chemistry at Harvard University. His doctoral thesis was notable for the contribution it made to low-resolution microwave spectroscopy. In it Sarachman showed that useful information on the configuration of complex molecules could be obtained from spectra in which rotational lines were highly overlapped. While he was a graduate student, the breadth of his scientific interests set him apart from many of his fellow students and foreshadowed his later contributions to teaching. His somewhat philosophical approach made his presence of unusual value at group discussions.

From 1961 to 1963 he was a National Academy of Sciences–National Research Council postdoctoral research associate at the National Bureau of Standards, where he continued his microwave studies of internal rotation and nuclear quadrupole interactions in organic molecules. Again, his keen interest in all aspects of physics and chemistry led to many useful contributions to the research of his colleagues. He left NBS in 1963 to become an assistant professor of physics, with a research emphasis in microwave spectroscopy, at the State University of New York at Buffalo. In 1970 he was appointed professor of physics at Whittier College. There his focus turned to teaching undergraduate physics and to astronomy. He became a visiting associate professor at Caltech in 1984 and afterward divided his teaching time between Caltech and Whittier. His students loved him; the faculty respected his integrity and wit; and the whole community witnessed, and learned from, his heroic struggle with leukemia.

Through his efforts an astronomy library was started at Western Observatorium in Whittier, California. That library is now named the Ted Sarachman Library. His courageous five-year battle, against what he knew were poor odds, was evident only in his thin hair, not in any diminution of his zest for teaching and learning or his love of astronomy.

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Herbert H. Chen

Herbert Hwa Chen died on 7 November 1987 after a yearlong battle with leukemia. He was an outstanding person and scientist, and his passing is a deep loss to his family and colleagues.

Chen was born in Chungking, China, on 16 March 1942. The political changes China was then undergoing made his early childhood one of hardship and uncertainty. As a result of the Eisenhower Refugee Act, he was allowed to enter the United States. His undergraduate education was supported almost entirely by scholarship awards. He received his BS in physics from Caltech in 1964, and earned his PhD in theoretical physics from Princeton University in 1968 as a student of Sam Treiman. After graduation Chen joined the faculty of the newly formed Irvine campus of the University of California as an assistant research physicist in 1968. It was here that he began the transition from theorist to the talented, visionary experimentalist that we all remember.

Chen's long-standing interest in the weak force centered on the study of neutrino interactions. When the high-flux proton linac at the Los Alamos Meson Physics Facility was commissioned, Chen quickly appreciated the potential of this unique source of electron neutrinos, proposing in 1971 that it be used to search for the then unobserved elastic scattering reaction $\nu_e e \rightarrow \nu_e e$. By 1975 he had demonstrated via a feasibility study that such an experiment was possible. With farsighted support from the National Science Foundation, the construction of the detector was begun in 1978. (The related reaction $\bar{\nu}_e e \rightarrow \bar{\nu}_e e$ was observed in 1976 by Henry W. Sobel, Henry Gurr and Frederick Reines.)

The experiment was a resounding success, measuring the cross section to a precision of 18%—sufficient to be sensitive to the charged- and neutral-current interference. This was an extraordinary achievement for a first-generation neutrino experiment, and established the utility of LAMPF as a neutrino source. The vigorous program currently under way there owes much to Chen's foresight. He was among the pioneers in realizing that massive liquid ionization chambers offered a possible key to hitherto inaccessible neutrino physics, and he proposed such a detector to Fermilab in 1976. Chen initiated a systematic attack on the problems facing large liquid time-projection chambers, becoming one of the world's leading exponents of the development of massive liquid argon chambers. Although an early advocate of the argon time-projection chamber for detecting solar neutrinos, he was quick to recognize the possibilities (arising from the temporary surplus of heavy water and the success of light-water proton-decay Čerenkov detectors) of constructing a massive heavy-water Čerenkov detector. Thus was formulated, in 1984, the Sudbury Neutrino Observatory, an international proposal to address the solar neutrino problem by making real-time measurements of the spectral shape and the total flux of high-energy neutrinos originating in the Sun. Such a series of measurements would be a crucial first step in using solar neutrinos to study weak interactions.

Chen left us with a legacy of a bold and exciting program of physics, but further, he left us an example of how one man can be a positive influence on the lives of others. His concern for his students was legendary, as were the standards he set for them. In spite of his hectic schedule, he would make time to explain problems, listen to questions or create new opportunities, the hardships of his early life perhaps making clear the value of such opportunities offered to others. In discussion with colleagues, he was encouraging and helpful.

It required courage to undertake the notoriously difficult experiments that became Chen's hallmark, and he faced his illness with the same courage. Although frequently hospitalized after the onset of his illness, he continued to guide and advise from his hospital bed via modem and telephone, promoting the physics he loved. In a tragically short career he achieved much; the seeds of ideas he left behind promise even more.

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PETER DOE
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