ocean-monitoring systems: a low-cost wireless network that would report on water quality worldwide and a deep-water system for gathering and reporting general, continuous data that cannot be retrieved from a traditional single sample of ocean water. That system would use a low-light camera that can photograph underwater sea life without disrupting it or scaring it away, Widder explained. The camera uses a photomultiplier tube and a red LED activated by flashes of bioluminescence. "Nets capture only the slow, stupid, and greedy," Widder said. "We need to be able to see into the depths of the ocean without disturbing [anything]. This is an unobtrusive window into the deep sea."

The MacArthur grant, she said, is hugely significant because it publicizes her message, recognizes the value of her work, and provides funding to support it. "The money will be used directly for our efforts to protect the ocean," Widder stated. "It is a great stamp of approval from a major foundation, and the fantastic thing about it is the door it is opening. We now have a voice that otherwise would have taken many years to establish."

Zaldarriaga is a theoretical astrophysicist who analyzes faint signatures of the Big Bang to piece together the early history of the cosmos, the foundation said. Early in his career, Zaldarriaga cowrote computer software known as CMBFAST, which has become a standard tool for astronomers interpreting observations of the cosmic microwave background (CMB); it has been used to estimate the total density of mass and energy in the universe. His analyses reveal the power of lensing, polarization, and other observations of the CMB for generating gravitational maps of the early universe and for indirectly exploring the properties of otherwise undetectable matter in the intervening space. Zaldarriaga is also adept at identifying the interpretive pitfalls in analyzing experimental data; his insights have directly affected the design of telescopes currently being constructed.

Recently, he and his colleagues have argued that the period after the Big Bang but before the formation of the first stars could be indirectly observed by examining CMB variations at the 21-cm wavelength. That proposal, said the foundation, may offer an experimental window into events that previously were matters of conjecture.

obituaries

PHYSICS TODAY has changed the way it publishes obituaries. Some will continue to appear in print, but most will be available only online (see PHYSICS TODAY, October 2005, page 10). Subscribers can visit http://www.physicstoday.org/obits to notify the community about a colleague's death and submit obituaries up to 750 words, comments, or reminiscences. Each month, recently posted material will be summarized here, in print. Select online obituaries will later appear in print.

Melvin Schwartz

Melvin Schwartz, who shared the 1988 Nobel Prize in Physics for the experimental demonstration that more than one type of neutrino exists, died on 28 August 2006 in Twin Falls, Idaho. Mel distinguished himself as a researcher, professor, administrator, entrepreneur, and devoted family man and had a major influence on all those arenas. He pursued each in his own style—optimistic, creative, passionate, and anti-bureaucratic. His first love, though, was physics, especially novel ideas.

Mel was born to immigrant parents in the Bronx, New York, on 2 November 1932. He graduated in 1949 from the

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Melvin Schwartz

Recently posted death notices at http://www.physicstoday.org/obits:

Alvin Weinberg
20 April 1915 – 18 October 2006
David P. Olsen
27 May 1939 – 11 October 2006
Dwight H. Damon
21 February 1931 – 15 September 2006
George Randolph Kalbfleisch
14 March 1931 – 12 September 2006
Yong-Ki Kim
20 February 1932 – 9 September 2006
Neville V. Smith
21 April 1942 – 18 August 2006
Wesley Emil Brittin
27 April 1917 – 1 August 2006
Ziemowid "Ziemek" Sujkowski
13 July 1933 – 9 July 2006
Markus Eduard Fierz
20 June 1912 – 20 June 2006
Wilbur Hummon Goss
16 June 1911 – 8 May 2006
Roman Evsey Glazman
26 June 1948 – 24 April 2006

Bronx High School of Science, where he had been exposed to the beauties and excitement of science. He then went to Columbia College, from which he received an AB in physics in 1953.

His entrance into the Columbia Graduate School of Arts and Sciences in 1953 was at a most auspicious time. Among the faculty were I. I. Rabi, T. D. Lee, Charles H. Townes, Leon Lederman, Polykarp Kusch, and Jack Steinberger, who became Mel's thesis adviser; fellow graduate students included Val Fitch and Leon Cooper. The concept of strangeness as a new quantum number for particles had just been introduced, and the bubble chamber invented. Steinberger decided to pursue both those subjects with three new graduate students—Mel, Jack Leitner, and me. Over the next few years, the group elucidated the properties and decay modes of many new elementary particles. Mel received his PhD in 1958; he worked at Brookhaven National Laboratory from 1956 to 1958 and at Columbia from 1958 to 1966.

In 1962 Mel, Lederman, and Steinberger—assisted by the talented younger physicists Dino Goulianos, Nari Mistry, and Gordon Danby—performed the simple and elegant experiment for which they earned their Nobel Prize. Mel was fortunate to be at Columbia in the 1950s and 1960s when it was the center for studying the weak interactions. It was there at the daily coffee hour that he conceived his idea of producing a high-energy neutrino beam from a high-intensity proton accelerator. A high-energy, high-intensity proton beam impinging on a solid target, such as beryllium, produces a huge number of charged pions that quickly decay into a beam of neutrinos. Those neutrinos can then be used in various experiments to explore the nature of the weak interaction. The technique opened up a new field of physics. The first experimental results from this approach demonstrated that at least two types of neutrinos exist—one associated with the electron and one with the muon. The Nobel Prize–winning experiment was performed at Brookhaven's Alternating Gradient Synchrotron (AGS). The detector was a novel 10-ton optical spark chamber in which the neutrinos from pion decays were observed to interact and produce only muons, not electrons.

After several more years at Columbia, Mel decided a change might be beneficial and in 1966 went to Stanford University to teach. He also became a group leader at SLAC and continued to work at Brookhaven, where he pursued a search for π–μ atoms. During the time of the 1974 October revolution, teams at Brookhaven (Samuel C.C. Ting and collaborators) and SLAC (Burton Richter and collaborators) were actively investigating vector mesons. Mel was at Brookhaven and, in his puckish way, became a communications link between the East and West coasts, disclosing preliminary results of the experimental groups. When the J/Ψ was discovered, priority issues were nicely resolved with both Ting and Richter sharing the 1976 Nobel Prize.

Mel spent substantial effort teaching and wrote a textbook on electromagnetism. He enjoyed guiding young students and exposing them to the pleasures of physics, which leads to a story Mel told me several times. It may be apocryphal, but I believe it to be true. Two Stanford students approached him about auditing one of his courses, to which he agreed. They met with him periodically to get his advice on a concept they had developed. Mel told them that their plan had two deficiencies: First, no one is interested in personal computers, and second, the name they chose, "Apple," wouldn't fly.

High-energy physics was becoming too theory-driven and bureaucratic, with program advisory committees, large detectors, and large teams, and Mel eventually became disillusioned with it. He left Stanford in 1983 to be an entrepreneur and started Digital Pathways, which provided secure communications to businesses. I believe Mel embarked on the venture not only to challenge himself in a new arena but also for the remote prospect of accumulating sufficient wealth so he could go to any lab and fund any experiment without having to get a committee's approval. He ultimately sold the successful enterprise.

It was around 1991 that I approached Mel about coming back to Brookhaven. His return was successful for several reasons: Eight years in industrial life was enough for him, and it was time to try something new; the experimental program at Brookhaven's AGS was well suited to his taste, with relatively small experiments and the opportunity to explore novel ideas; and Brookhaven had started building the Relativistic Heavy Ion Collider, which would greatly benefit from guidance from someone with Mel's interests and inclinations. He molded both programs, especially RHIC. Mel and his advisory committee rejected the 11 original RHIC proposals and remolded them into 4 unique experiments that resulted in the discovery of the strongly interacting quark–gluon plasma.

At Brookhaven Mel again demonstrated his disdain for bureaucrats. During an annual high-energy physics review by the US Department of Energy, Mel and a high-level official had a heated exchange. In effect, Mel was told that he would have to shut down the AGS program in a few years, which to him sounded unreasonable, and he strongly objected. Words were exchanged, and Mel told the official to go fly a kite, but in more earthy language. High-energy physics at the AGS was closed down in 2003.

After a fruitful tenure as associate director of high-energy and nuclear physics at Brookhaven, Mel returned to Columbia in 1994, where he became the I. I. Rabi Professor of Physics. Columbia honored him with both the John Jay Award and the Alexander Hamilton Medal. He retired in 2000, moving to Ketchum, Idaho, where he spent his final years.

Among Mel's attributes was his ability to get along with and befriend a large portion of the high-energy community. Amazingly, he was on close terms with a diverse group of strongly opinionated individuals, including Luis Alvarez, Valentine Telegdi, and Martinus Veltman. We have all benefited from having known Mel, and it is refreshing to note that a smile appears on people's faces when his name is mentioned.

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