

Wolf Foundation honors Lederman, Perl, Pimentel and Polanyi

The Wolf Foundation has presented its annual prizes for "outstanding contributions on behalf of mankind." Leon Lederman of Fermilab and Martin Perl of Stanford University share the honors in physics. In addition, George C. Pimentel of the University of California, Berkeley, and John C. Polanyi of the University of Toronto share the chemistry award.

Each year since the prizes were first awarded in 1978, the Wolf Foundation has recognized contributions with substantial cash awards "given to promote science in all fields and art in all its forms." This year, prize winners in six fields, selected by an international committee that includes five Nobel laureates, received cash prizes totaling \$600 000.

Lederman and Perl were cited jointly "for their experimental discovery of unexpected new particles establishing a third generation of quarks and leptons," and equally shared the \$100 000 cash award for physics. Before their discoveries, eight particles were known, four quarks and four leptons, the number required by the Glashow-

Weinberg-Salam model that describes electromagnetic and weak interactions. "The discovery of a fifth quark and sixth lepton came as a complete surprise and opened a new direction in particle physics," the committee said.

Working with his associates at Fermilab, Lederman discovered the up-silon particle as part of his efforts in a long and fruitful experimental program devoted to the study and production of muon pairs. In the same experiment with the up-silon discovery, a fifth quark and its antiquark were discovered. In addition, "the spacings between the energy levels provided significant new information for the theories of quantum chromodynamics describing the binding of quarks into hadrons, while the very existence of a fifth quark raised much deeper problems which are still unresolved," the Foundation said. Lederman has made other substantial contributions to our understanding of fundamental physics, including the discoveries of the long-lived K^0 , the non-conservation of parity in muon decay, and the existence of two kinds of neutrinos.

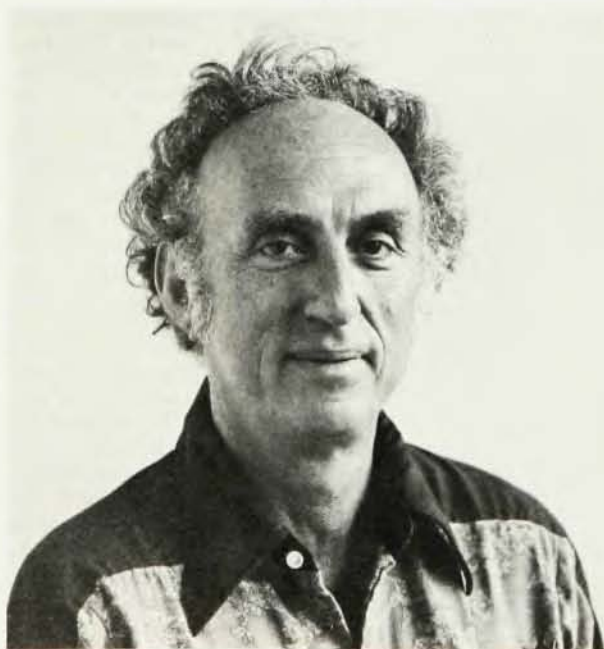
After receiving his PhD from Columbia University in 1951, Lederman joined the faculty there. He became director of the Nevis Laboratories in 1968 and Higgins Professor of Physics in 1973; since 1979 he has been director of Fermilab.

Perl's discovery of the tau lepton began with the pursuit of anomalous electron-muon pairs in the original SLAC-LBL magnetic detector at SPEAR. The Perl group designed the apparatus to provide an unambiguous signature of the production and decay of a pair of heavy leptons. Since each tau candidate decayed into a visible spectrum electron or muon and a neutrino, which always escaped detection, "the unambiguous identification of the tau presented unusual difficulty." As the evidence grew, however, anomalous events were attributed to a "U" particle and then to the tau lepton. The mass, spin and couplings of the tau have since been measured in experiments at SPEAR and DORIS; more recently, the Mark II detector at PEP has measured the lifetime of the tau. While discovery of the tau was made by

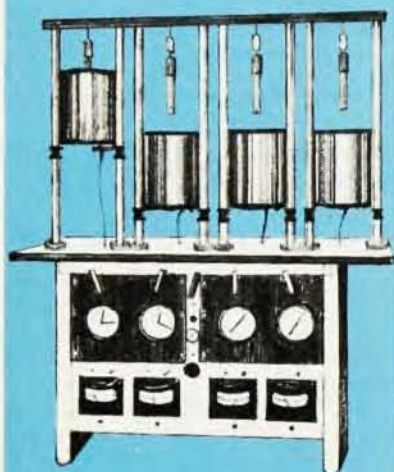
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an experimental group working together at SLAC, the prize committee noted that Perl "single-handedly pushed, inspired and directed the search for a new heavy lepton," and "it was his careful analysis of the early data which proved the existence of the new particle."

Perl received his PhD from Columbia University in 1955 and taught at the University of Michigan until 1964, when he came to Stanford University. He is now professor of physics there and active in high-energy physics research at SLAC.

The Wolf Foundation also recognized the "outstanding contributions in the field of chemistry" of John Polanyi and George Pimentel. They shared equally the cash award of \$100 000 that accompanies this honor.

Pimentel was cited "for development of matrix isolation spectroscopy and for discovery of photodissociation lasers and chemical lasers." Pimentel, now at the University of California, Berkeley, has also done work in infrared spectroscopy and molecular structure, chemical lasers, hydrogen bonding, infrared study of planetary atmospheres, rapid-scan infrared, and the thermodynamics of hydrocarbons. Since obtaining his PhD in chemistry from Berkeley in 1949, Pimentel has spent most of his career there. While pursuing his teaching and research activities he also found time to serve as deputy director of the National Science Foundation, from 1977 to 1980, and to contribute in numerous capacities as an adviser to



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the science community.

Polanyi was cited by the Foundation "for his studies of chemical reactions in unprecedented detail by developing the infrared chemiluminescence technique, and for envisaging the chemical laser." Now at the University of Toronto, Polanyi has worked in reaction dynamics, photochemistry and energy exchange; he has also investigated by many means the atomic and molecular motions underlying chemical reactions. He obtained his PhD in chemistry from the University of Manchester in 1952 and worked with the National Research Council of Canada in Ottawa and at Princeton University before coming to the University of Toronto in 1956.

Beams and Pegram medals awarded

The Southeastern Section of The American Physical Society has presented its annual Beams and Pegram medals. The Pegram medal was given to Robert G. Hussey of Louisiana State University, a special Pegram medal was awarded to Paul E. Shearin of the University of North Carolina at Chapel Hill, and the Beams medal was presented to Horst Meyer of Duke University.

The George B. Pegram Medal is given each year by the Southeastern Section to recognize excellence in teaching within the region. Hussey was described as "a man of warmth and humility whose primary concern has always clearly been for the well-being and progress of his students."

Hussey has been a member of the Department of Physics and Astronomy at Louisiana State University since he received his PhD there in 1962. Since 1971 he has also been Associate Dean of the College of Chemistry and Physics. He has worked in fluid dynamics with a particular interest in the flow of incompressible fluids and in flow at low

Reynolds numbers. In addition to his teaching and research contributions, he has been a leader in the Louisiana Section of the American Association of Physics Teachers and in the Louisiana Academy of Sciences.

The special Pegram medal is awarded by the APS Section to recognize outstanding physics teaching within the region by a person who was teaching when the Southeastern Section was formed. Shearin was noted by his colleagues because "as a teacher, he provided a shining example of quiet effectiveness and persistent thoroughness for generations of undergraduate and graduate students."

Shearin began his teaching career in a high school during the Depression years. By 1937, when the Southeastern Section was founded, he was already teaching physics at the University of North Carolina, Chapel Hill. He remained there, serving on the faculty and as chairman of the Department of Physics and Astronomy until his retirement in 1972.