

IN BRIEF

Erich Bloch has joined the faculty of George Mason University as a distinguished visiting professor in the Center for Science, Trade and Technology Policy. Bloch was director of the National Science Foundation from 1984–90.

Four individuals were honored on 29 November by the Materials Research Society. **William W. Mullins**, a university professor emeritus of materials science and engineering at Carnegie-Mellon University, was given the Von Hippel Award. The MRS Medal Awards went to **Federico Capasso**,

head of the quantum phenomena and device research department at AT&T Bell Laboratories, and **Ruud Tromp**, manager of interface science at IBM's Thomas J. Watson Research Center. **Didier de Fontaine**, a professor of materials science and engineering at the University of California, Berkeley, was selected as the David Turnbull Lecturer.

Richard F. Casten is the new director of the Wright Nuclear Structure Laboratory and a professor of physics at Yale University. He is on a leave of absence from Brookhaven National Laboratory, where he has been a senior scientist.

axial U(1) problem. Dashen and collaborators Curtis Callan and David Gross—and, independently, Roman Jackiw and Claudio Rebbi—further discovered that the instantons implied the existence of an infinity of unsuspected vacuum states of quantum chromodynamics and an unsuspected new coupling constant, the θ -angle, on which all physical quantities depend in a nonperturbative way.

In the early eighties, Dashen turned his attention to the lattice approach to solving gauge theories. He and Herbert Neuberger realized that the axiomatic field theory results on the triviality of $\lambda\phi^4$ theory could be used to establish a theoretical upper bound on the Higgs mass.

At the time of his death, Dashen was working with Elizabeth Jenkins and Aneesh Manohar on applying the $1/N_c$ expansion of QCD (where N_c is the number of colors) to understanding the static properties of hadrons. A remarkable result was that the $1/N_c$ corrections vanished for certain quantities, such as the pion–nucleon couplings.

In parallel with his career in particle physics, Dashen had a second scientific career in applied theoretical physics. He borrowed methods from quantum field theory to illuminate some of the difficult problems of classical physics. His application of path integral methods to the problem of fluctuations in sound propagation in random media opened up new areas in acoustic oceanography. He made numerous contributions to the problem of scattering from rough random surfaces. His work in these areas was inspired by and applied to problems of submarine security. He served the US Navy as a high-level adviser in many capacities, and was particularly proud of his active role in the establishment of the NSF Institute for Theoretical Physics in Santa Barbara.

Roger Dashen was a brilliant scientist, a concerned citizen and a valued colleague. He possessed a rare combination of intellectual vision and breadth combined with personal warmth and accessibility. His great joy in doing theoretical physics was infectious, and he gave generously of his time and inspiration to younger collaborators. As a scientist, teacher, colleague and human being, he deeply touched the lives of many people and will long be remembered.

ANEESH MANOHAR

University of California, San Diego

La Jolla, California

CURTIS CALLAN

Princeton University

Princeton, New Jersey

OBITUARIES

Roger Dashen

Roger Dashen died of a heart attack on 25 May 1995 in La Jolla, California, at the age of 57. He was one of the most influential particle theorists of his generation and played a leading role in the development of our understanding of symmetries in quantum field theory.

Dashen was born in Grand Junction, Colorado, in 1938. He majored in physics (and played varsity football) at Harvard University, graduating in 1960. He received his doctorate in theoretical particle physics from Caltech in 1964. He spent the first few years of his career at Caltech but in 1967 went to the Institute for Advanced Study, where he was appointed professor in 1969.

In 1986 Dashen left the IAS to accept a position at the University of California, San Diego, where he served a six-year term as chairman of the physics department.

As a graduate student and young postdoc at Caltech, Dashen was a major player in the struggle to convert the new ideas of SU(3) symmetry and current algebras into a dynamical theory of hadrons. These efforts were inspired by the successes of Murray Gell-Mann's SU(3) symmetry and by Stephen Adler's and William Weisberger's conversion of the global SU(2) $\times$ SU(2) algebra into a successful sum rule for g_A . Dashen and Gell-Mann collaborated on ingenious attempts to turn the much richer local SU(2) $\times$ SU(2) current algebra into a predictive tool for hadron physics.

In the late sixties and early seventies, Dashen made major contributions to the theory of chiral symmetry in the strong interactions. He formulated a criterion for determining the vacuum state of the theory and obtaining the masses of the (approximate) Goldstone



ROGER DASHEN

bosons. The papers that Dashen and his collaborators wrote in this period developed many of the important ideas of chiral symmetry. Two important applications were the work with Ta-Pei Cheng on the pion–nucleon sigma term and Dashen's theorem on the equality of the electromagnetic contribution to the π^+ and K^+ mass.

In the mid-seventies, Dashen, Brosl Hasslacher and Andre Neveu developed the quantum theory of solitons using the path integral approach. Although the three researchers worked in the WKB approximation, they conjectured that many of their results were exact, a conjecture later verified by Sidney Coleman. Their papers are the standard reference for path integral quantization of solitons.

Semiclassical methods were finally brought directly to bear on particle physics with Polyakov's discovery of instantons in quantum chromodynamics and with Gerard 't Hooft's realization that these objects solved the