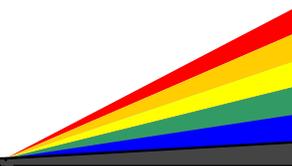


APS COLLOQUIUM SERIES



Speaker: **Hans Frauenfelder**
 Los Alamos National Laboratory

Hans Frauenfelder received his Dr. sc. nat. in experimental physics in 1950 from the Swiss Federal Institute of Technology in Zürich, Switzerland, where his primary teachers were Paul Scherrer and Wolfgang Pauli. From 1952 to 1992, he taught in the Physics Department of the University of Illinois at Urbana-Champaign, and since 1992 he has been at Los Alamos National Laboratory, currently as Director of the Center for Nonlinear Studies. His earlier research included studies of surfaces, nuclear energy levels, perturbed angular correlations, Mössbauer effect, and parity violation in nuclear physics. His current work concerns the physics of biomolecules, in particular, their energy landscapes and dynamics. He is a fellow of the American Physical Society and a member of several professional societies including the National Academy of Sciences and the American Academy of Arts and Sciences.

Title: **“Proteins Connect Biology, Chemistry, and Physics”**

Schrödinger called proteins aperiodic crystals, but they actually form a unique state of matter, with characteristics of solids, liquids, and polymers. Their structure, dynamics, and function permit studies of physical, chemical, and biological problems that are difficult to attack in man-made systems. Complex systems, such as proteins, do not exist in a unique structure. They can assume a very large number of related conformations and must be described by an energy landscape. Each valley in the energy landscape, called a conformational substate, corresponds to a particular structure, with corresponding physical, chemical, and biological properties. Studies of the energy landscape in some proteins has led to insight into their organization and their fluctuation and relaxation phenomena. The exploration of protein reactions provides information about chemical reaction mechanisms, from tunneling of molecules to the Kramers theory and fluctuating barriers. Combining the physical and chemical results helps to elucidate biological phenomena. In living systems, proteins do not exist in isolation, they are embedded in protein networks determined by the genome. Thus studies of protein networks may lead to insight into really complex systems.

Date: **Wednesday, October 3, 2001**

Time: **11:00 a.m.**

Location: **402 Auditorium**

Refreshments will be served at 10:45 a.m.