

T_cSUH Bi-Weekly Brown Bag Seminar

Texas Center for Superconductivity
University of Houston



Prof. John H. Miller, Jr.

Department of Physics and T_cSUH
University of Houston

“Novel Bioelectric Phenomena in Cellular Organelles”

Friday, February 3, 2006

Room 102, University of Houston Science Center
12:00 Noon – 1:00 p.m.

Abstract

We have been investigating unusual bioelectric phenomena using novel, generally noninvasive, sensors. Recent topics of interest include: (1) studies of harmonic response of active membrane pumps (P-type ATPases), which we have observed in budding yeast cells using superconducting quantum interference devices (SQUIDs); (2) nonlinear harmonics, in response to sinusoidal electric fields, produced by electron transport chain complexes and a molecular turbine, known as ATP synthase, in mitochondria; (3) similar studies of light-activated harmonics, which we have recently discovered in chloroplasts; and (4) studies of the dielectric and conducting properties of cytoskeletal proteins, such as tubulin heterodimers, which self-assemble to form microtubules.

Bio

Prof. Miller received his Ph.D. at the University of Illinois in 1985, where he studied the dynamics of charge density waves under the direction of John Tucker and two-time Nobel laureate John Bardeen. He was a faculty member in the Department of Physics and Astronomy at the University of North Carolina - Chapel Hill from 1986-1989, receiving the prestigious Alfred P. Sloan Research Fellowship in 1987. In 1989, he joined the University of Houston as a faculty member in the Department of Physics and the Texas Center for Superconductivity. Prof. Miller's research has included experiments probing the pairing state symmetry of high-T_c superconductors, applications of superconducting quantum interference devices, and noninvasive biosensors and their use to probe the electromagnetic properties of live cells and complex biological macromolecules.

Persons with disabilities who require special accommodations in attending this lecture should call (713) 743-8210 as soon as possible.



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