

**COLLOQUIUM
DEPARTMENT OF PHYSICS
UNIVERSITY OF HOUSTON**

**Tuesday, April 6, 2010
4:00pm
Bldg S&R1 Room 634**

**Frozen in Time: Neutrino Physics with Liquid
Argon Detectors**

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The discovery just over a decade ago that neutrinos can change identities by oscillating between flavors was a revolutionary change to the Standard Model description of particle physics. This discovery implies that neutrinos are not massless, and that they could play a crucial role in answering some of the most fundamental questions in particle physics, such as whether the observed matter-antimatter asymmetry in the universe can be attributed to CP violating neutrino interactions. Many experiments are attempting to solve the remaining mysteries of neutrino behavior, but this is a challenging task due to the elusive nature of these particles. Liquid Argon Time Projection Chambers (LAr TPCs) are ideally suited for the study of neutrino interactions thanks to their precision detection capabilities that make them the modern day equivalent of bubble chambers. In this talk I will motivate the compelling questions in neutrino physics and introduce the LAr TPC technique, highlighting recent work in the development of this technology. Finally, I will discuss preliminary ideas for the ultimate experiment that could be conducted at the Deep Underground Science and Engineering Laboratory (DUSEL) in South Dakota as part of a world-class U.S. neutrino program that is currently being planned.

Dr. Ed Hungerford, Host