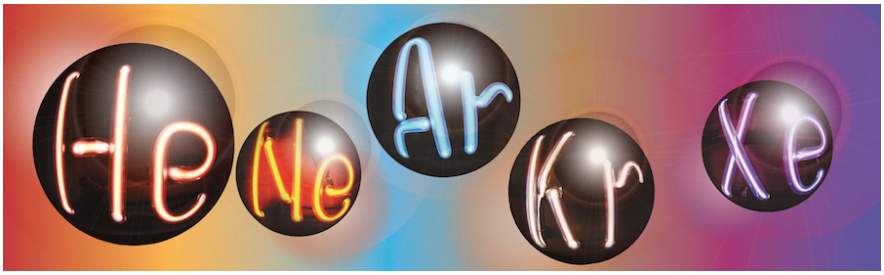

Contribution ID: **42** Type: **Presentation**

The LArIAT light detection system

Saturday, 23 September 2017 14:00 (15 minutes)

The LArIAT experiment utilizes a Liquid Argon Time Projection Chamber (LArTPC) at the Fermilab Test Beam Facility to study the response of LArTPCs to charged particles of energies relevant for planned neutrino experiments. In addition, it will help to develop and evaluate the performance of the simulation, analysis, and reconstruction software used in other LAr neutrino experiments. Particles from a tertiary beam detected by LArIAT (mainly pions, electron, protons, kaons and muons) are identified using a set of beam-line detectors. In its effort towards augmenting LArTPC technology for other neutrino experiments, LArIAT also takes advantage of the scintillating capabilities of LAr and is testing the use of light signal to help reconstruct calorimetric particle identification information. Two cryogenic photomultiplier tubes (PMTs) and several varieties of silicon photomultipliers (SiPMs) mounted to custom preamplifier boards are suspended behind the LArIAT TPC's wire planes. Reflective foils coated in tetraphenyl butadiene (TPB) line the field cage walls to downshift scintillation vacuum-ultraviolet (VUV) photons into detectable visible light. Additionally, in the most recent data taking period, a new light detection device (the ARAPUCA) was deployed for R&D studies. In this presentation we will highlight analyses underway which use the visible light to identify and reconstruct Michel electrons, improve particle identification, and present results from the ARAPUCA light device.

Primary author: Prof. KEMP, Ernesto (University of Campinas (BR) and Fermilab)

Presenter: Prof. KEMP, Ernesto (University of Campinas (BR) and Fermilab)

Session Classification: Saturday Afternoon

Track Classification: Light/charge readout (PMTs, SiPM, WLS, electronics, etc.)