

Department of Physics and Astronomy Colloquium Series

Tuesday, April 4th, 2:30pm in PSE 317

Speaker: Dr. Tejin Cai

Institution: York University

Title: Using anti-neutrinos for precision measurements on free protons at MINERvA

Abstract: Antineutrino scattering on free protons (or neutrino scattering off free neutrons) gives a unique measurement of neutron and proton structure and is a building block for predicting neutrino scattering on more complex nuclei. Previous measurements have had to rely on scattering neutrinos off deuterium and then correct for nuclear effects, or use low intensity anti-neutrino beams. In this talk MINERvA will present the first high statistics cross section measurement of the charged current elastic process $\bar{\nu}_\mu p \rightarrow \mu^+ n$ using the plastic scintillator (CH). The carbon background is significantly reduced and constrained with minimal model dependency using the kinematics of the reconstructed neutrons. The result can be directly compared with lattice QCD computations, and to electron scattering off free protons.