Andrew Ludwig – HEP Seminar – April 12, 2022
Jet Propulsion Lab

Title: "Simulating Neutrinos for Space-based & Suborbital Experiments in the Radio and Optical with NuSpaceSim"

Abstract: In this talk, I describe a new comprehensive, end-to-end simulation package for modeling extensive air shower (EAS) signals from very-high energy (> PeV) cosmic neutrinos for sub-orbital and space-based observations. The NuSpaceSim collaboration aims to provide a practical and efficient cosmic neutrino EAS signal generation modeling package to the community that will provide a standard to gauge the neutrino measurement performance of experiments and aid in their development. I will discuss the modeling of tau neutrino interactions, propagation, tau-lepton decays, forming composite EASs, generating the air fluorescence, Cherenkov, and radio signals, the radiation propagation through the atmosphere, and show some preliminary results generated by the NuSpaceSim package. The latter part of the talk will detail planned improvements, as well as some as of yet unsolved problems, with a focus on the radio implementation.