Abstract Submitted
for the APR20 Meeting of
The American Physical Society

Galactic Supernova Neutrino Detection with the NOvA Detectors JUSTIN VASEL, Indiana University, ANDREY SHESHUKOV, Joint Institute for Nuclear Research, Dubna, Russia, ALEC HABIG, University of Minnesota Duluth, NOVA COLLABORATION — Detectors around the world are poised to measure the neutrino flux from the next galactic core-collapse supernova in unprecedented detail and to shed light on the hitherto poorly-understood dynamics involved in these explosions, and on the nature of the neutrino itself. Because complete neutrino flavor sensitivity will be critical for extracting valuable physics insights from such an observation, a diverse array of capable detectors is desirable. NOvA is a long-baseline neutrino oscillation experiment designed to measure a neutrino beam with energies narrowly-peaked around 2 GeV. For a 27 solar mass supernova at 10 kpc, several thousand MeV-scale neutrino interactions are expected to occur in NOvAs liquid scintillator near and far detectors. Measuring these neutrinos requires overcoming several challenges: the supernova neutrino spectrum is close to detection threshold, the far detector is subject to a large cosmic muon flux, and each interaction generates a small number of depositions which can resemble electronic noise. In this talk, I present recent work in addressing these challenges to enable NOvA to make a measurement of the neutrino flux from the next galactic core-collapse supernova.

Justin Vasel
Indiana Univ - Bloomington

Date submitted: 10 Jan 2020 Electronic form version 1.4