

Center for Neutrino Physics Seminar

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Neutrinos from Type Ia Supernovae, DDT vs. GCD

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4:00pm—5:00pm

304 Robeson Hall

Despite their use as cosmological distance indicators and their importance in the chemical evolution of Galaxies, the unequivocal identification of the progenitor systems and explosion mechanism of normal Type Ia supernovae (SNe Ia) remains elusive. The leading hypothesis is that such a supernova is a thermonuclear explosion of a carbon-oxygen white dwarf but the exact explosion mechanism is still a matter of debate. Observation of a Galactic SN Ia would be of immense value in answering the many open questions related to these events. One potentially useful source of information about the explosion mechanism and progenitor is the neutrino signal. In this presentation, I will describe our computation of the expected neutrino signal from two different explosion mechanisms and show how the flux at Earth contains features in time and energy unique to each mechanism. Then I will show the expected event rates in the Super-K, Hyper-K, JUNO, DUNE, and IceCube detectors. The detectable neutrino signal from each explosion mechanism is compared to reveal that the overall event rate is the most discriminating feature between the two scenarios followed by the event rate time structure.