Western Michigan University
Department of Physics Colloquium

Speaker: Remco Zegers, Ph.D.
Michigan State University, National Superconducting Cyclotron Laboratory

“Core-collapse supernovae and the role of electron captures in late-stage stellar evolution”

Open to the public, free of charge

Monday, April 1, 2019

Refreshments: 3:30 p.m., Bradley Commons, 2202 Everett Tower
Talk: 4 p.m., 1110 Rood Hall

Abstract: Core-collapse supernovae are amongst the most energetic events in the universe we know and contribute to nucleosynthesis and galactic chemical evolution. Our understanding of how massive stars evolve into supernovae has improved significantly through observations and sophisticated and multi-dimensional models that contain a wide variety of physics inputs. Still, there are important open questions that require further improvement of these inputs.

One important ingredient for simulations of late stellar evolution are electron captures on light and medium heavy nuclei. Although one must largely rely on theoretical models for estimating electron capture rates, these models must be benchmarked and guided by experimental data. The best way to do this is by using so-called charge-exchange reactions, from which the nuclear structure information needed to estimate electron-capture rates can be deduced. Performing charge-exchange experiments with the goal to constrain the electron capture rates in core collapse supernovae and other astrophysical phenomena is one of the main goals of the charge-exchange group at NSCL. The presentation will focus on the interplay between the astrophysical, theoretical, and experimental efforts necessary to improve our understanding of core-collapse supernovae and the experimental efforts to constrain the electron captures rates.

Parking: Metered parking is available in Parking Structure #2, near Miller Auditorium.

More information: (269) 387-4940    Department of Physics email    Campus map