

Thorne-Żytkow Objects: Observing exotic Red Supergiants with the Magellan Telescope

Anna O'Grady, PhD candidate
Dunlap Institute for Astronomy & Astrophysics
Department of Astronomy & Astrophysics
University of Toronto

DATE: Wednesday, March 20, 2019

TIME: 3:00 PM

PLACE: C2045

ABSTRACT: Thorne-Żytkow objects (TŻOs) are a strange, hypothetical subclass of red giants or red supergiants (RSGs) that contain neutron stars inside their convective envelopes. Supergiant TŻOs are formed either from a close binary system undergoing common envelope evolution after one companion has exploded as a supernova, or by an asymmetric supernova kicking a neutron star into its RSG companion. Confirming the existence, frequency, and lifetime of TŻOs would provide useful constraints on binary evolution. Unfortunately, it is difficult to identify TŻOs from photometric colours alone due to their resemblance to RSGs, but one strong candidate TŻO has been identified in the Small Magellanic Cloud by Levesque et al. (2014) through spectroscopic analysis. This candidate, HV2112, has very strong photometric variability and an unusual light curve. I've carried out a systematic search for HV2112-like variability in the Magellanic Clouds, identifying ~10 strong new candidate systems from amongst millions of stars. In this talk I'll present my results so far, including analysis of the pulsations, physical parameters and intrinsic nature of these sources. I will also discuss my experience observing at Las Campanas Observatory in Chile, where I observed for this project using the Magellan telescopes.

ALL ARE WELCOME!