



Contribution ID: 27

Type: **Talk**

From Clustered Environments to Common Envelopes: The first systematic identification of white dwarf-main sequence post-common envelope binaries in star clusters

Wednesday, 21 August 2024 14:45 (20 minutes)

Close binary systems are the progenitors to a variety of compact object mergers producing Type Ia supernovae and gravitational waves. While most short-period binaries are believed to have evolved through at least one common envelope (CE) phase, our understanding of CE evolution is limited due to the lack of observational benchmarks that connect the post-CE parameters with the pre-CE initial conditions. Identifying post-CE systems in star clusters can circumvent this issue by providing an independent constraint on the system's age, but only two white dwarf-main sequence (WD+MS) post-CE systems in a stellar cluster have ever been discovered. In this talk, I will describe our ongoing efforts to systematically identify the first population of WD+MS post-CE binary systems in Milky Way star clusters. First, I will describe our new catalogue of ~50 WD+MS binary candidates in ~30 open star clusters identified through multi-wavelength observations and supervised machine learning. Next, I'll detail the follow-up spectroscopy and monitoring of a subset of our systems that led to the characterization of new WD+MS post-CE systems in clusters. Our new sample will at least double the known population of post-CE systems in clusters, ultimately allowing for new observational constraints on one of the most uncertain yet important phases of binary evolution.

Affiliation

University of Toronto

Current Position

PhD Student

Primary author: GRONDIN, Steffani (University of Toronto)

Presenter: GRONDIN, Steffani (University of Toronto)

Session Classification: Stellar multiplicity, exotica, and transients in star clusters

Track Classification: Stellar multiplicity, exotica, and transients in star clusters