

2020—2021 ASTROPHYSICS SEMINAR SERIES

Small But Mighty: The Tiniest White Dwarf and Other Stories

The advent of Gaia and of large photometric and spectroscopic surveys is changing the landscape of white dwarf studies. These incredible new data sets, together with improved models, have enabled tackling some unsolved mysteries concerning white dwarfs as a population, as well as discovering extremely peculiar objects that challenge our understanding of white dwarf formation and evolution. In my talk, I will show how the precise astrometry from Gaia has dramatically improved our capability of studying white dwarfs in young star clusters, and therefore probe the evolution of white dwarfs born from single progenitor stars. On the other hand, the Zwicky Transient Facility (ZTF) is shedding light on the evolution of white dwarfs in binary systems, substantially increasing the number of known eclipsing white dwarf binaries and finding the final products of such binaries. In fact, ZTF is discovering a large number of massive, rapidly rotating and highly magnetized white dwarfs whose extreme properties characterize them with high confidence as remnants of white-dwarf mergers. Finding a population of white dwarf merger remnants just below the Chandrasekhar mass can help constrain the number of mergers in the Galaxy and their contribution to the type Ia supernova rate, as well as help us understand the origin of strong magnetic fields in white dwarfs. I will present some early results of the search, including the discovery of ZTF J1901+1458, a moon-sized white dwarf that is extreme in almost every respect.

**Tuesday, October 12th**

3:30 - 4:30 p.m.

See website for Zoom details

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