

2025—2026 ASTROPHYSICS SEMINAR SERIES**A paradigm shift in the landscape of Type Ia supernova progenitors**

Type Ia supernovae have been the subject of intense study for decades, spurred in part by their important contribution to our understanding of dark energy, but the identity of their progenitors has remained a mystery. However, a coherent and satisfying explanation may finally be within reach. In this talk, I will present the mounting evidence that most Type Ia supernovae are explosions of sub-Chandrasekhar-mass white dwarfs (WDs) in double WD binaries, in stark contrast to the classical picture of a Chandrasekhar-mass WD accreting from a non-electron-degenerate companion. This evidence includes progenitor modeling, explosion simulations, and radiative transfer calculations that match observations with higher and higher fidelity; the prediction and discovery of an increasing number of hypervelocity surviving companion stars; and recent theoretical work showing that nearly all WDs can support detonations if impacted with sufficient strength. I will also describe recent work suggesting that most Type Ia supernovae actually arise from the detonations of not just one, but both, of the sub-Chandrasekhar-mass WDs in double WD binaries.

**Monday, April 6th**

2:30 - 3:30 p.m.

CAS 502

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