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Do Single-Degenerate Type Ia Supernovae Generally Lead to Normal Type Ia Supernovae? ROBERT FISHER, University of Massachusetts Dartmouth — Type Ia supernovae (SNe Ia) serve as crucial standardizable candles for cosmology, yet we still do not fully understand their origins. Recent observational and theoretical progress has favored merging and helium-accreting sub-Chandrasekhar mass white dwarfs (WDs) in the double-degenerate and the double-detonation channels, long thought to be the underdog models, as the dominant progenitors of normal SNe Ia. Thus the fate of rapidly-accreting Chandrasekhar mass WDs in the single-degenerate channel remains more mysterious then ever. In this talk, I will clarify the nature of ignition in Chandrasekhar-mass single-degenerate SNe Ia and demonstrate that the overwhelming majority of ignition events within Chandrasekhar-mass WDs in the single-degenerate channel are generally expected to be buoyancy-driven, and consequently lack a vigorous deflagration phase. I will show, using both analytic criteria and multidimensional numerical simulations, that the single-degenerate channel is inherently stochastic and leads to a variety of outcomes from failed SN 2002cx-like events through overluminous SN 1991T-like events. I will conclude with a range of observational tests which will either support or strongly constrain the single-degenerate scenario.

Robert Fisher
University of Massachusetts Dartmouth

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