



The Beginnings and Ends of Double White Dwarfs

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Do sub-Chandrasekhar mass white dwarf explosions occur in nature?

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Carbon-oxygen WDs accreting a helium shell have the potential to explode in the sub-Chandrasekhar mass regime through the double detonation scenario, when a helium shell ignition propagates a shock wave into the the core of the WD causing a central ignition. I will present the results of a recent numerical parameter survey of hydrodynamic and radiative transport models of sub-Chandrasekhar mass white dwarf explosions. I examine a relationship between SiII velocity and luminosity which, for the first time, identifies a sub-class of observed supernovae that are consistent with these models. I will show the distinct observational signatures of sub-Chandrasekhar mass WD explosions predicted for early time, peak and nebular observations. I will also discuss the discovery of the peculiar Type I supernova, SN2018byg: the first observed sub-Chandrasekhar mass mass white dwarf explosion triggered by the ignition of a massive helium shell.

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