



# PHYSICS AND ASTRONOMY SEMINAR

## Dr. Marten van Kerkwijk

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### “Thermonuclear supernovae and the quest to understand why white dwarfs explode”

#### Abstract

If a carbon-oxygen white dwarf explodes, it will look like a type Ia supernova, with most of the carbon and oxygen fused to silicon- and iron-group elements. But it remains unclear both under what physical conditions the explosions are triggered and in what astronomical configurations these conditions are brought about. What is clear is that the standard picture, in which unstable fusion is ignited in white dwarfs that approach or are made to exceed the largest possible

(Chandrasekhar) mass, can easily reproduce neither the rates nor the properties of normal type Ia supernovae. I will discuss these and related conundrums, describe our efforts to see if supernovae could result generally from mergers of similar-mass carbon-oxygen white dwarfs, and try to summarize possible observational tests.

Friday March 27, 2015  
10:00 a.m.  
Elliott Building  
Room 161