

Electron-capture induced thermonuclear supernovae: explosion and nucleosynthesis

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Electron capture reactions may lead to a gravitational collapse of a massive oxygen-neon white dwarf. At the same time, they initiate thermonuclear burning that can counteract this effect. Therefore, the fate of the star – a core-collapse supernova producing a neutron star or a thermonuclear explosion – is uncertain. We present three-dimensional hydrodynamic simulations of the propagation of thermonuclear flames in oxygen-neon white dwarfs aiming to answer this question. Predictions for nucleosynthesis yields from the expected events that can help to constrain the scenarios.