

Talk at Splinter Meeting

Splinter F

MODELING TYPE IA SUPERNOVA EXPLOSIONS AND THEIR
NUCLEOSYNTHESIS

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The main obstacle to a theoretical understanding of the mechanism of Type Ia supernovae is the progenitor problem: the systems from which such events arise have not yet been identified observationally. The lack of confirmed initial conditions leads to uncertainties in modeling of Type Ia supernovae as thermonuclear explosions of white dwarf stars. Several possibilities for the progenitor evolution and the explosion mechanism have been suggested and the quest is how to distinguish them by comparison to observational data. While for some sub-classes suitable models have been identified, the bulk of normal Type Ia supernovae remains enigmatic. Discriminating models on the basis of lightcurves and spectra around peak luminosity is hardly possible at the moment. Nucleosynthesis effects, however, provide a key to assess the role different models play in the total sample of Type Ia supernovae and their contribution to galactic chemical evolution. Some of the rare channels potentially lead to peculiarities in abundance patterns.