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**Radiative Transfer in Type Ia Supernovae**

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Some white dwarf stars die in a thermonuclear runaway leading to complete stellar disruption within seconds – a Type Ia supernova. The material ejected in that explosion will shine brightly for months, powered by the decay of freshly synthesized radioactive isotopes. Multi-physics hydrodynamical codes are now simulating the first violent seconds of the event, and a treatment of the subsequent radiation transport is needed to calculate predictions of the observable light curves, spectral evolution, and spectropolarization. Here I discuss Monte Carlo techniques for addressing multi-group time-dependent radiative transfer in 3-dimensional, rapidly expanding plasmas, where the densities are low and non-LTE effects can be important. I compare our model calculations directly to astronomical observations, and discuss how the simulations are helping us understand the progenitors and explosion mechanism of Type Ia supernovae, as well as refining their applicability as probes of cosmological expansion.