



Next-Generation Simulations of The Remarkable Deaths of Massive Stars

CARL FIELDS

| *LOS ALAMOS NATIONAL LABORATORY*

Multidimensional progenitor models can enable us to capture the chaotic nuclear shell burning occurring deep within the interior of a massive star. I will discuss ongoing efforts to progress our understanding of the nature of massive stars through next-generation hydrodynamic stellar models. In particular, I will present recent results of a three-dimensional hydrodynamic massive star model including rotation evolved for the final 10 minutes before collapse. These recent results suggest that realistic 3D progenitor models can be favorable for obtaining robust models of CCSN explosions and affect the properties of the compact objects they form. I will conclude with a brief discussion of the implications our models have for predictions of multi-messenger signals from CCSNe.

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