

3D Supernova Explosions of 9, 10, 11, & 12 Solar-mass Stars

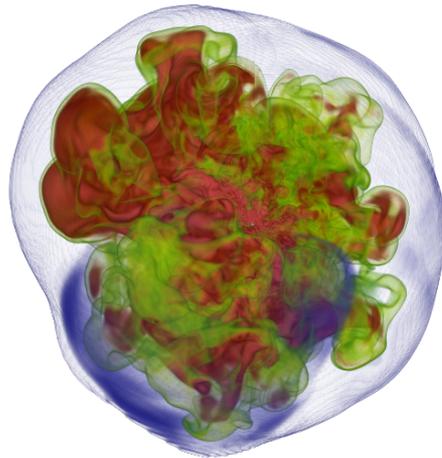
Objectives

To simulate in 3D with full physics the explosion of low-mass massive stars via the neutrino heating mechanism.

Impact

Our new 3D models from 9 to 12 solar masses explode, demonstrating for them the viability of the neutrino-driven, turbulence-aided mechanism of CCSNe.

53 s



Accomplishments

Using the new state-of-the-art core-collapse supernova code Fornax, we have simulated the three-dimensional dynamical evolution of low-mass massive stars.. Our 3D exploding models frequently have a dipolar structure, with the two asymmetrical exploding lobes separated by a pinched waist encompassing multiple bubble structures. Our results suggest that at least for the lowest mass progenitors we are converging on a credible solution to the supernova problem.

Citation: Burrows et al. 2019 (arXiv:1902.00547); Contact : Adam Burrows



U.S. DEPARTMENT OF
ENERGY

Office of
Science

TEAMS

Toward Exascale Astrophysics of
Mergers and Supernovae