

Astro 541. Sample Topics in Supernova Theory

1. Neutrino Mechanism of Core-Collapse Supernova Explosions
2. Nuclear Equation of State for Supernova Simulations
3. Neutrino-matter interactions in Core-Collapse Supernovae
4. Nuclear Equation of State and Neutron Star Structure
5. Pulsar Kicks and Proper Motions
6. Supernova Nucleosynthesis
7. R-process Nucleosynthesis (process, sites, halo)
8. Galactic Chemical Evolution from its Birth
9. Neutrino Nucleosynthesis
10. Instabilities and Mixing in Supernova Envelopes during Explosion
11. Gravitational Wave Signatures of Core-Collapse Supernovae
12. Neutrino Diagnostics: Emission and Detection of Supernova Neutrinos
13. The Effects of Neutrino Oscillations on Detected Supernova Neutrino Signals
14. Supernova Shock Breakout
15. Light Echoes from Supernovae
16. Theories for the Phillips Relation for Type Ia Supernovae
17. Progenitors of Type Ia Supernovae
18. Supernova Spectral Diagnostics and Typing
19. Supernova Light Curves (as a function of type, etc.)
20. Neutron Star Mergers
21. Models for Episodic Mass Loss from Massive Stars (supernova progenitors)
22. Jet Models for Gamma-Ray Bursts (“MHD”)
23. Propagation of Supernova Blast Waves through the ISM: Supernova Remnants
24. Cosmic-Ray Acceleration in SNR Shocks
25. Stellar-mass Black Hole Formation
26. The Physics of Gravitational Wave Detection
27. Supernova Feedback in Galaxies and Galaxy Formation
28. Superbubbles