

## Hydrodynamical and magnetohydrodynamical instabilities in supernova cores

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The collapse-driven supernova is an explosive phenomenon that occurs at the end of the evolution of massive stars with about 10 solar mass or more. It is supposed to be driven by the gravitational collapse of the central core, which is supported by degenerate electrons, in the evolved stars. Despite intensive and extensive investigations over the years, the mechanism of explosion remains unclear. The current issue attracting many researchers in this field is the instability of the standing accretion shock wave and its possible coupling with oscillation modes of proto neutron star. On the other hand, the role of magnetic fields in the supernova core has been re-assessed recently. This is mainly due to the observations of highly magnetized neutron stars, the so-called magnetars, and the theoretical expectation that the magnetorotational instability (MRI) will be operating in the supernova core which will amplify a tiny seed field to such an extent that the dynamics is affected substantially. In this talk, I will review these hot topics concerning the supernova mechanism.