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国台学术报告 NAOC COLLOQUIUM

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Time: Thursday 2:30PM, Nov. 13 Location: A601 NAOC

Asymmetric supernovae explosions: theory and experiment

Dr. Thierry Foglizzo (CEA Saclay, France)

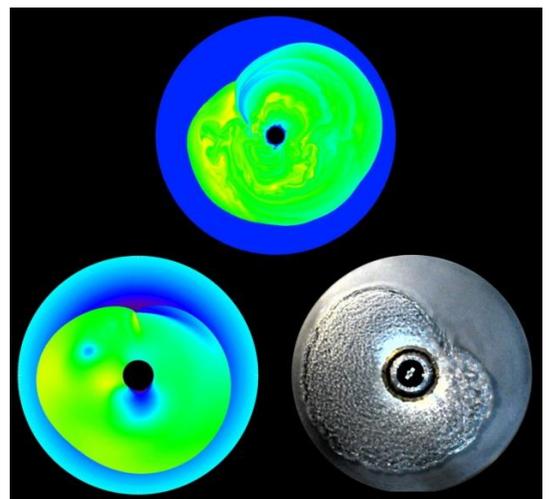


Dr Thierry Foglizzo leads a group of theoretical astrophysics at CEA Saclay, France, dedicated to the modelling of astrophysical plasmas using numerical methods. He is a specialist of supernova theory, accretion and instabilities. He started his career as a postdoctoral researcher at the Max Planck Institute for Astrophysics in Garching, Germany (1994-96), after a PhD at CEA Saclay and an engineering degree

from the Ecole Polytechnique. Thierry Foglizzo developed an original approach of supernova hydrodynamics in 2011, using a shallow water analogy. In 2014, his supernova fountain received a prize from the French Ministry of Research and joined the permanent collection of the science museum “Palais de la Decouverte” in Paris.

Abstract

The explosive death of massive stars starts with the collapse of their core and the formation of a neutron star. Understanding the reversal of the collapse into an explosion is still a challenge despite decades of theoretical efforts. The breaking of spherical symmetry is triggered by the development of hydrodynamical instabilities, which affect the kick and spin of the neutron star and favour an asymmetric explosion. Neutrino driven convection and the Standing Accretion Shock Instability (SASI) are the dominant instabilities, depending on the structure of the progenitor. I will characterize the properties and consequences of these instabilities using simplified numerical simulations, and a shallow water experiment named SWASI. The first results from a new version of the SWASI experiment illustrate the dynamical effects of rotation in the collapsing core.



All are welcome! Tea, coffee, biscuits will be served at 2:15 P.M.