NewCompStar School 2017 - "Neutron stars: theory, observations and gravitational waves emission"



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Neutrino and magnetic effects on binary neutron star mergers

Binary neutron star mergers are now thought to be a main source of r-process nucleosynthesis, by which most of the heavy elements in our universe have been produced. Furthermore, such systems also constitute a prime candidate for the formation of short gamma ray bursts, which can serve as important electromagnetic counterparts to future gravitational wave detections of such systems.

Using a recently developed microphysics framework we have been able to study the merger of binary neutron stars in full general relativity taking also into account neutrino cooling effects and magnetic fields. We will present initial findings for both a stable remnant hypermassive neutron star and a collapse to a black hole torus system. We will also comment on further developments to include neutrino heating.

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