

Plenary-07

Numerical relativity for binary neutron-star mergers

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Numerical relativity aims at solving the Einstein equations and the other relativistic equations in the highly curved spacetime of compact objects, like black holes and compact stars, often called neutron stars. In particular, studies of binary neutron-star mergers are at one forefront of astrophysical research mainly because these systems are strong sources of gravitational waves, possible progenitors of one type of gamma-ray bursts, and probably crucial contributors to the generation of heavy elements.

I will review the current global status of research on mergers of binary neutron star systems, focusing on three-dimensional general-relativistic simulations and their use to interpret data from the new-generation gravitational-wave detectors that have just started operation and are expected to detect tens of binary-merger events per year. Gravitational-wave measurements will allow investigating previously inaccessible information, like the equation of state of ultrahigh density stars.