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The physics of Binary Neutron Star merger from general relativistic numerical simulations.

Friday, 10 June 2016 11:00 (45 minutes)

Abstract: In this talk I will focus on the physics of Binary Neutron Stars merger
obtained from numerical simulations of the Einstein equations coupled to matter.
The results are obtained using a semi-realistic descriptions of the equation of
state (EOS), where the EOS is described by a seven-segment piece-wise polytropic
and a thermal component. One of the important characteristics of the present
investigation is that it is entirely performed using only publicly available open source software,
the Einstein Toolkit for the dynamical evolution and the LORENE code for the generation of the
initial models. After the gravitational-wave event GW150914, observed by the LIGO/Virgo
collaboration, the new eve of Gravitational Wave physics has just began and it is clear that
accurate modelling of the gravitational wave signal emitted by compact binary sources
will play a prominent role.

In particular I will present results for the gravitational wave-signal obtained
from three-dimensional numerical simulations of the dynamics of binary neutron star (BNS)
mergers from the late stage of the inspiral process up to about 20 ms
after the system has merged, either to form a hyper-massive neutron star (NS)
or a rotating black hole (BH).

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