

HAW14-2014-000180

Abstract for an Invited Paper
for the HAW14 Meeting of
the American Physical Society

Neutron star merger, gravitational waves, and the dense matter equation of state¹

YUICHIRO SEKIGUCHI, Yukawa Institute for Theoretical Physics

The equation of state of dense matter that determines properties of the neutron star also characterizes the dynamics and gravitational waveforms emitted during binary neutron-star mergers. Understanding the effects of the equation of state on them requires numerical-relativity simulations of the mergers and a number of strategies for extracting information of equation of state from gravitational waves have been proposed. Furthermore, recent numerical-relativity simulations also clarified that the neutron-star equation of state has a significant impact on the r-process nucleosynthesis which proceeds in the neutron-rich ejecta of the mergers. The r-process in the mergers has been accumulated wide interests both as a possible origin of heavy nuclei and a promising electro-magnetic counterpart to gravitational waves. I will review these topics and discuss possible feedbacks to the nuclear physics.

¹Supported by the JSPS Grant-in-Aid for Scientific Research (24244028, 25103510), Scientific Research on Innovative Area (20105004), and HPCI Strategic Program.