Contribution ID: **210** Type: **Talk**

Electromagnetic emission from long-lived binary neutron star merger remnants

Tuesday 15 December 2015 14:21 (21 minutes)

Recent observations indicate that in a large fraction of binary neutron star (BNS) mergers a long-lived neutron star (NS) may be formed rather than a black hole. Unambiguous electromagnetic (EM) signatures of such a scenario would strongly impact our knowledge on how short gamma-ray bursts (SGRBs) and their afterglow radiation are generated. Furthermore, such EM signals would have profound implications for multimessenger astronomy with joint EM and gravitational-wave (GW) observations of BNS mergers, which will soon become reality with the ground-based advanced LIGO/Virgo GW detector network starting its first science run this year. Here we present a model to bridge the gap between numerical simulations of the merger process and the relevant timescales for the afterglows, assuming that the merger results in a long-lived NS. It provides a self-consistent evolution of the post-merger system and its EM emission starting from an early baryonic wind phase and resulting in a final pulsar wind nebula that is confined by the previously ejected material. We present lightcurves and spectra and discuss these results in the context of SGRBs, their X-ray afterglows, and multimessenger astronomy.

Author: Mr SIEGEL, Daniel (Max Planck Institute for Gravitational Physics (Albert Einstein Institute))

Co-author: Dr CIOLFI, Riccardo (University of Trento and INFN-TIFPA)

Presenter: Mr SIEGEL, Daniel (Max Planck Institute for Gravitational Physics (Albert Einstein Institute))

Session Classification: 13 - Gamma-ray bursts