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General Relativistic Simulations of Low-Mass Magnetized Binary Neutron Star Mergers BRUNO GIACOMAZZO, University of Trento — We will present general relativistic magnetohydrodynamic (GRMHD) simulations of binary neutron star (BNS) systems that produce long-lived neutron stars (NSs) after merger. While the standard scenario for short gamma-ray bursts (SGRBs) requires the formation after merger of a spinning black hole surrounded by an accretion disk, other theoretical models, such as the time-reversal scenario, predict the formation of a long-lived magnetar. The formation of a long-lived magnetar could in particular explain the X-ray plateaus that have been observed in some SGRBs. Moreover, observations of NSs with masses of 2 solar masses indicate that the equation of state of NS matter should support masses larger than that. Therefore a significant fraction of BNS mergers will produce long-lived NSs. This has important consequences both on the emission of gravitational wave signals and on their electromagnetic counterparts. We will discuss GRMHD simulations of "low-mass" magnetized BNS systems with different equations of state and mass ratios. We will describe the properties of their post-merger remnants and of their gravitational and electromagnetic emission.

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