

## **Binary neutron stars from gravitational radiation to R-process nucleosynthesis**

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Beyond being prime targets for gravitational radiation detection Compact Binary Mergers are the likely sources of short GRBs as well as the most likely origin of heavy R-process material. The latter idea, a 25 years old proposition, has received observational support with the discovery of a Macro-nova - an IR signal that followed the short GRB 130603B and is the hallmark of newly formed R-process material. In this short review I describe the formation of the Macro-nova from matter ejected in the merger process and I discuss recent searches for a radio flare that should follow the Macro-nova signal (the Macro-nova and the associated radio flare are the analogues of a Supernova and a subsequent supernova remnant). Recent estimates of the cosmological evolution of rate of neutron star mergers (based on observations of short GRBs) lead to predictions on the cosmic evolution of abundance of heavy R-process material. I compare those with observations. Finally I discuss the implications of the observations of a Macro-nova and the predictions of Radio Flares for the identification of the exact positions of mergers whose Gravitational Radiation signals have been detected.

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