

# Kilonova: Electromagnetic Signature of r-process Nucleosynthesis

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The first gravitational wave observation from a neutron star merger was successfully made for GW170817. The detection triggered electromagnetic wave observations over the entire wavelength range, which enabled the first identification of an electromagnetic counterpart of a gravitational wave source. In the ultraviolet, optical, and infrared wavelengths, the counterpart shows characteristic properties of "kilonova", electromagnetic emission powered by radioactive decays of newly synthesized r-process elements.

In this talk, I introduce basic physics involved in kilonovae and summarize what we have learned about r-process nucleosynthesis by neutron star mergers through the observations of GW170817 (and possible events during LIGO/Virgo O3). Then, I highlight open questions and future prospects toward understanding the origin of r-process elements in the Universe.