

Kilonova

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Kilonova is an optical and near-infrared emission from neutron star mergers. When two neutron stars merge, strong gravitational waves are emitted and a part of the neutron star material is ejected into interstellar space. In the ejected material, heavy elements such as gold and platinum are synthesized by a rapid neutron capture process. Kilonova is an electromagnetic emission powered by radioactive decays of newly synthesized heavy elements. In August 2017, it was announced that researchers had successfully made the first detection of gravitational waves from a neutron star merger (GW170817). Subsequently, electromagnetic emissions in the various wavelengths were also observed from GW170817. The observed properties of the optical and near-infrared counterparts are similar to theoretical expectations of kilonova. Astronomers may have witnessed the place where heavy elements are produced.

