Contribution ID: **57** Type: **Invited talk**

Signatures of r-process elements in optical-infrared spectra of neutron star mergers

Tuesday, 29 August 2023 14:10 (40 minutes)

Binary neutron star (NS) merger is a promising site for the rapid neutron capture nucleosynthesis (r-process). The radioactive decay of newly synthesized elements powers electromagnetic radiation, as called kilonova. The detection of gravitational wave from a NS merger GW170817 and the observation of the associated kilonova AT2017gfo have provided with us the evidence that r-process happens in the NS merger. However, the abundance pattern synthesized in this event is not yet clear. In this talk, I will focus on the spectra of kilonova to extract information of elements synthesized in neutron star mergers. Based on our recent findings, I will discuss elemental features in kilonova spectra, and identification of elements in AT2017gfo.

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Session Classification: Multi-Messenger Astronomy and Astrophysics