



Contribution ID: 124

Type: **Contributed talk**

# Multi-dimensional kilonova radiative transfer simulations

*Thursday 19 September 2024 16:40 (15 minutes)*

The detection of the kilonova AT2017gfo has provided us with a wealth of observations. However, to interpret these observations to obtain information about the underlying merger ejecta, including r-process nucleosynthesis, we are reliant on kilonova modelling. The majority of binary neutron star ejecta models considered when simulating kilonovae have been in 1D, or even idealised toy models, which have neglected the complexities related to hydrodynamics modelling. I will show that 3D kilonova radiative transfer simulations are critical, due to the asymmetric nature of these events, and will present results on a 3D simulation from hydrodynamical merger ejecta using line-by-line opacities from millions of r-process transitions. I will also highlight the necessity of accurate atomic data of r-process elements, for which experimentally obtained data is highly incomplete.

**Primary author:** COLLINS, Christine (GSI Helmholtz Centre for Heavy Ion Research)

**Presenter:** COLLINS, Christine (GSI Helmholtz Centre for Heavy Ion Research)

**Session Classification:** Plenary Session