

TITLE:

The Italian follow-up observations of GW triggers in the Multi-Messenger Era

ABSTRACT:

On August 17th, 2017 the first electromagnetic counterpart of a gravitational wave (GW) event originated by the coalescence of a double neutron star system (GW 170817) was finally observed. A world-wide extensive observing campaign was carried out to follow-up and study this source, with the forefront participation of the Italian team GRAWITA (Gravitational Wave INAF TeAm). In particular, our unique VLT dataset provided the first compelling observational evidence for the existence of "kilonovae", transient sources powered by radioactive decay of heavy elements resulting from the r-process nucleosynthesis of ejected neutron star matter. In this talk, I will present the activities we carried out to optimize the response of the Italian GRAWITA network of facilities to expected GW triggers and our results for past (O1 and O2) and current (O3) observing runs. All the activities I will describe are expected to provide means and opportunities to the Italian and European astronomical communities to have a leading role in the GW and Time Domain Astronomy.