

The new frontier of Multi-Messenger Astrophysics: follow-up of electromagnetic transient counterparts of gravitational wave sources.

Proposta di tesi:

Optical transients in the multi-wavelength and multi-messenger era

Dott. Enrico Cappellaro

enrico.cappellaro@inaf.it

With the detection of dozens of gravitational waves sources we have just entered in the new era of multi-messenger astronomy. The first, still tentative, association of a high neutrino with a Blazar in an active state is also pushing for a comprehensive view of astrophysical phenomena.

In many cases, the mechanism that give rise to multi-messenger signals involves compact objects (NS or BH) that likely originated from the collapse of (very) massive stars.

In this project, we want to identify and study very massive stars in their late stages of evolution that includes the convulsions leading to the core collapse and the resulting supernova explosion.

Our group is part of the Italian (GRAWITA) and European (ENGRAVE) collaboration leading the search and follow up of electromagnetic counterpart-of GW emission.

We are also implementing the search for variable/transient possible associated to neutrinos and/or high energy radiation/particles events.

To these aims, we can exploit our access to existing search and follow-up facilities. At the same time we try to get prepared for the future, with simulations of the next generation LSST surveys and exploration of the multi-wavelength synergies with the planned SKA radio telescopes.