Low Latency gravitational alerts of the LIGO/Virgo collaboration

The second LIGO-Virgo observational run witnessed the birth of gravitational-wave multi-messenger astronomy. The first ever gravitational-wave (GW) detection from the coalescence of two neutron stars, GW170817, came with an associated gamma-ray counterpart, GRB 170817A, as well as its optical, X-ray and radio counterparts (AT 2017gfo). In this talk, I will first describe the O2 low-latency program of the LIGO/Virgo collaboration, enabling multi-messenger discovery as well as the online candidates shared with observing partners during O2. The next observation campaign O3 (begun in April 2019) is already a success with dozens of low-latency alerts sent: the expected rate of binary black hole (BBH) triggers is about few per months whereas binary neutron stars rate is estimated to be less than ten for a full year. To do this, the LIGO-Virgo Collaboration has developed a robust alert system for the open public alerts (OPA) era in order to enable prompt electromagnetic follow-up. This requires some automation, such as: selection of the best GW trigger candidate among the different online searches and the low and medium latency validation process to reject transients originating from the noise as well as downstream indications about the nature of the event. This talk will present an overview of the O3 LIGO-Virgo low-latency multi-messenger program in its second half.