FAST Proposal Coverpage

Last updated: 01/10/2019

Project Name:

Detecting radio counterparts of gravitational wave sources during LIGO O3 with FAST

Project Summary:

(A 1 paragraph summary of your project, including its scientific goals and how you will address them. This information will be potentially public.)

ALIGO/Virgo opened the door of gravitational wave astronomy by discovering the black hole-black hole (BH-BH) merger event GW 150914. Afterwards the detection of a nearby (distance ~ 40 Mpc) binary neutron star (NS) merger event GW 170817 provides an unprecedented opportunity to discover its electromagnetic counterpart, GRB 170817A/AT 2017gfo, by space missions and ground-based optical telescopes. Together with radio follow-ups, the comprehensive dataset allows to establish solid evidence of the physical NS-NS origin and the existence of the associated kilonova. Our team has access to a wide network, including a few optical telescopes inside and outside China, aiming to search and verify optical counterparts in the coming aLIGO/Virgo O3 period, which covers the FAST commissioning period. We propose to do radio follow-up observations with the FAST for O3 targets (NS-NS and NS-BH mergers) with a possible electromagnetic counterpart. The multi-wavelength data will allow to study their physical origins, energetics, velocities, jet structure, ejected mass, and can be even used to constrain cosmological parameters and evolution.