Proposal Abstract:

Comprehensive multi-wavelength follow-up observations of gravitational wave events by the merger of compact star binaries play a crucial role in determining the nature of the central engine and the properties of the ejecta. In particular radio observations detect synchrotron emission produced by the relativistic outflow from the merger, and provide unique insight into the geometry and dynamics of the outflow and the surrounding environment. The radio light curves of GW170817/GRB170817A suggest an embedded off-axis structured jet. However, we do not know whether the afterglow of GW170817/GRB170817A is typical of the population. The LIGO-Virgo-KAGRA collaboration has scheduled the start of the O4 observing run for May 24, 2023. Thus, we propose a Target of Opportunity program of radio follow-up of gravitational wave events. We plan to monitor the radio light curve, which can allow us to investigate the circum-merger density, and energetics of the merger outflow. During the observation period, it is also possible to detect fast radio burst events that are coincident with gravitational wave/gamma-ray burst events.