MKT-22097

Searching for off-axis radio emission from binary neutron star mergers using optically detected kilonovae

Abstract

We are resubmitting our successful, highly ranked open time proposal from the 2020 call. The discovery of gravitational and electromagnetic waves from the binary neutron star merger GW 170817 confirmed the mutual origin of some short gamma-ray bursts(sGRB) and kilonovae. The kilonova was observed as a rapidly evolving, optical transient. Radio emission from the sGRB, observed as a mildly off-axis jet, evolved over 100s of days. With this proposal, we aim to detect the first truly off-axis jet from a binary neutron star merger. Observations one week, three weeks, two, four and seven months, and one year post-merger will follow the evolution of the jet as it decelerates and becomes visible to us. We will study the lateral structure of the jet, and aid in determining the true rate of cosmological sGRBs.