NWS15-2015-000065

Abstract for an Invited Paper
for the NWS15 Meeting of
the American Physical Society

Ongoing preparations for electromagnetic and particle follow-up of gravitational wave observations in the Advanced LIGO era[1]

SUKANTA BOSE, Washington State University

As the Advanced LIGO detectors gear up to begin observations in the fall scientists are preparing to use gravitational waves (GWs) as probes of a variety of astronomical phenomena. Some proposed scenarios use them in conjunction with electromagnetic (EM) and particle observations to more completely characterize their sources. These scenarios require confronting various types of challenges, which this talk will describe. They include fast analysis of noisy data from multiple detectors for finding weak and transient GW signals, localizing their sources in the sky to within a few to several tens of square degrees, and collaborating with a network of telescopes and detectors to find their EM and particle counterparts. Such a multi-messenger quest may eventually establish if indeed certain short hard gamma-ray burst progenitors are mergers of compact object binaries involving neutron stars (NSs). It may also help constrain the NS equation of state.

[1]This work was supported in part by NSF award PHY-1206108 and IUSSTF award 61-2010.