

Microlensing of continuous gravitational waves

Thursday, 7 November 2024 09:15 (60)

The direct detection of gravitational waves (GWs) by the LIGO Science Collaboration marked the beginning of a new era in astronomy, allowing us to probe previously inaccessible realms of the universe. Among the most exciting prospects in this field is the detection of gravitationally lensed GWs, which could reveal valuable insights about intervening mass distributions in space. While much attention has focused on detecting lensing in GWs from merging compact binaries, little exploration has been directed toward the lensing of GWs emitted by isolated neutron stars. These GWs are continuous and monochromatic, differing significantly from the transient “chirp” signals we typically observe. In this talk, I will discuss our findings on the lensing of continuous GWs by dark mini-halos and demonstrate how the relative motion between the lens, source, and observer can produce a distinctive microlensing pattern. This work opens new avenues in the study of GW lensing and could provide unique insights into the nature of dark matter besides enhancing the detectability of a signal.

Presenter(s) : HARIKUMAR, Sreekanth (National Centre for Nuclear Research(NCBJ))