Search for lensing signatures in the gravitational-wave observations from the first half of LIGO-Virgo's third observing run

LIGO Virgo KAGRA Webinar
Thursday 27 May 2021
1400 UTC (1000 Eastern US time)

Abstract

The Advanced LIGO and Advanced Virgo detectors are now observing large numbers of gravitational-wave signals from compact binary coalescences, with 50 entries in the latest transient catalogue GWTC-2. With this rapidly growing catalogue, our ability to explore new research avenues improves. One such avenue with a long and productive history in electromagnetic astronomy – and great potential for the future of gravitational-wave astrophysics – is gravitational lensing.

This presentation covers the first LIGO-Virgo collaboration search for signatures of gravitational lensing in data from O3a, the first half of the third advanced detector observing run. We study:

1) the expected rate of lensing at current detector sensitivity and the implications of a non-observation of strong lensing or a stochastic gravitational-wave background on the merger-rate density at high redshift;
2) how the interpretation of individual high-mass events would change if they were found to be lensed;
3) the possibility of multiple images due to strong lensing by galaxies or galaxy clusters; and
4) possible wave-optics effects due to point-mass microlenses.

Our webinar will present results from our recent paper: http://arxiv.org/abs/2105.06384.

All welcome. Register online at:

tinyurl.com/lvk-webinar7