Searching for dark-matter black holes from LVK gravitational wave detectors

Donghui Jeong

Pennsylvania State University

djeong@psu.edu

Unveiling the nature of dark-matter particles poses one of the most challenging problems in modern particle physics and cosmology. Besides its guaranteed gravitational interaction, we do not have solid evidence for the other interactions that dark matter might be participating. On the other hand, astronomical observations may suggest dark matter has a more complex particle nature than the standard cold dark matter scenario assumes. Intriguingly, the dark matter that is not only self-interacting but also dissipative can give rise to a diverse array of structures all the way down to compact objects and black holes formed from dark matter. In that case, gravitational-wave data from mergers of compact objects provides a new, complementary set of constraints as well as a possible discovery channel.