

Gravitational-wave lensing in an active galactic nucleus

Sunday, 5 July 2026 14:30 (15 minutes)

The dense and dynamic environments that is active galactic nuclei (AGN) accretion disks may be a birthplace for binary black holes (BBHs). It is thus a new possible formation channel for BBHs, which is getting more interest recently. This presentation exhibits recent results aimed at describing the gravitational waves (GWs) lensing of a binary merger event occurring behind an AGN (an AGN-BBH system). Such systems present several interesting features. They have the advantage of being simple enough for constraints to be derived with only few assumptions, to a well controlled precision. Using lensing, their relative proportion in observed GWs events should be strongly constrained by future GWs observatories. In particular, this will eventually require devising some discrimination criteria for attributing GW events to lensing in an AGN-BBH system. Thusly, I shall detail the GWs signatures an AGN-BBH system can imprint on the lensed GWs parameters, such as a Doppler shift, that could realistically be detected in the future.

Primary authors: Dr MARTENS, Paul (The Chinese University of Hong Kong (CUHK)); Mr LEONG, Samson H. W. (The Chinese University of Hong Kong (CUHK)); Mr ZHANG, Ryan (Johns Hopkins University); Prof. HANNUKSELA, Otto A. (The Chinese University of Hong Kong (CUHK))

Presenter: Dr MARTENS, Paul (The Chinese University of Hong Kong (CUHK))