

Third Gravi-Gamma Workshop: The multimessenger view of the black hole life cycle



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Type: **Invited talk**

Unveiling early black hole growth with multi-frequency gravitational wave observations

Friday, 7 October 2022 11:00 (30 minutes)

In ~ 2034 LISA will be able to detect the gravitational waves (GWs) from the coalescence of massive black hole binaries (MBHBs) in between $[10^5, 10^7] M_{\odot}$ solar mass up to $z \sim 10$. If the merger happens in a wet environment, copious amounts of radiation across the entire electromagnetic (EM) spectrum is expected to be produced by the accretion of the gas onto the binary.

If LISA locates the MBHB merger within an error box of sub-squared degree accuracy, EM telescopes can be pointed to identify the host galaxy and detect the EM counterpart to the GW signal, paving the way to test the nature of gas in a rapidly changing space-time and to perform cosmology and General Relativity experiments. In this talk I will discuss the possibilities to observe jointly the GW and EM signal and recent results on the synergies between LISA and future EM facilities such as LSST, SKA, Athena.

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