

# Vulcano Workshop 2022 - Frontier Objects in Astrophysics and Particle Physics



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## LISA-Athena synergy for detecting GW and HE counterparts of supermassive binary BH mergers

*Monday, 26 September 2022 13:05 (25 minutes)*

In  $\sim 2035$  LISA will be able to detect the gravitational waves (GWs) from the coalescence of massive black hole binaries (MBHBs) in the mass range  $[10^5, 10^7] M_{\odot}$  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, Athena 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 present recent results on the synergies between LISA and Athena observations to detect together MBHBs mergers. I'll also discuss the possibility of observing the EM emission in optical and/or radio.

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