Contribution ID: **44** Type: **not specified**

Constraining cosmological parameters with massive black hole binaries

Tuesday, 2 May 2023 15:00 (20 minutes)

In ˜2034 the Laser Interferometer Space Antenna (LISA) will detect the coalescence of massive black hole binaries (MBHBs) from 10^5 to $10^7 M_\odot$ up to z∼20. The gravitational wave (GWs) signal is expected to be accompanied by a powerful electromagnetic (EM) counterpart, from radio to X-ray, generated by the gas accreting on the binary.
GWs are standard sirens (StSis) since they carry the direct information of the luminosity distance of the source. If an EM counterpart is present, the galaxy hosting the merger can be identified and the redshift can be determined with follow-up observations, opening the possibility to test the expansion rate of the Universe. In this talk, I will present the recent LISA forecasts to constrain cosmological parameters with multimessenger observations of MBHBs. Assuming between ∼7-20 StSis, LISA will be able to constrain the Hubble constant at a few percent.
Moreover, since the population of StSis extends from z∼2 up to z∼8, LISA will be able to constrain also the high-redshift expansion of the Universe, measuring H(z) at different pivot redshifts and to test dark-energy models in a still uncharted territory, where few other cosmological probes are present.

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Session Classification: Gravitational Waves