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GWs in cosmology, the galaxy catalogue method

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Modern cosmology is confronted with a persistent tension over the value of the Hubble constant H_0, between local measurements (e.g. by SH0ES) and estimates from the cosmic microwave background (by Planck). Gravitational waves (GWs) offer a new way of assessing the expansion of the Universe, in particular by using *dark sirens*, which are gravitational sources with no electromagnetic counterpart.

In this context, I am working on the use of galaxy catalogues to constrain the Hubble constant on the basis of detections of *dark sirens*. The idea is to identify, statistically, the most likely host galaxy of the OG event, in order to associate a redshift z with it and to deduce H_0 from the luminosity distance measured directly at the time of detection.
The method is already well established for certain real catalogues such as GLADE. My aim is to adapt and evaluate these techniques for simulated catalogues that are better suited to sources that can be detected by LISA, such as supermassive black hole binaries (MBHBs). In particular, I am using *lightcone mocks* type catalogues, in order to test the robustness of cosmological inferences in more realistic contexts.

This work aims to anticipate the performance of LISA for cosmology with dark sirens, by exploring the impact of the characteristics of galactic catalogues on the accuracy of H_0 measurements.

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