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The astrophysical gravitational-wave background as a probe for both astrophysics and cosmology

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The frequency spectrum of the stochastic gravitational wave background (SGWB) from compact binary coalescences has a characteristic peak that depends on the specific features of the source population, notably the mass and redshift distribution. The underlying cosmology has an impact as well, mainly through the value of the Hubble parameter. The peak of the SGWB can be used as an observable, complementary to resolved events, to constrain the astrophysics of sources and the cosmological evolution. This possibility becomes even more intriguing, as the Einstein Telescope is expected to detect the stochastic background with exceptional sensitivity. In this talk, I will present how the high-frequency shape of the SGWB from binary neutron stars can be used to gain insights into the underlying astrophysics and cosmology. Specifically, I will show how, through a Markov Chain Monte Carlo analysis, it is possible to constrain a selection of astrophysical and cosmological parameters, and I will discuss the applicability of these techniques to other sources of stochastic background expected to be observed with ET.

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