

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



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Stochastic Gravitational-Wave Backgrounds: Current Detection Efforts and Future Prospects With Ground-based Interferometers

The collection of individually resolvable gravitational wave (GW) events makes up a tiny fraction of all GW signals in our Universe, while most lie below the confusion limit of our observatories and thus remain undetected. Like voices in a crowded room, the collection of unresolved signals gives rise to a background which is well-described via stochastic variables, and hence referred to as the stochastic GW background (SGWB). In a recent review paper [arXiv:2202.00178], we outline what possible GW sources can contribute to such a background, and give an overview of stochastic detection methods with different GW experiments. In this talk, I will focus on detection methods with the current second generation (2G) interferometer network, laying out a roadmap to detection. In the process, I will characterize the SGWB we expect to measure with the 2G network, and highlight the challenges we face when trying to measure this elusive signal. Finally, I will briefly outline future detection prospects with third generation (3G) interferometers and review proposed data analysis techniques tailored to this class of detectors.

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