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Characterizing the Population of Binary Black Holes with Detections of Arbitrary Significance[1] JAVIER ROULET, Princeton University, TEJASWI VENUMADHAV, University of California, Santa Barbara, BARAK ZACKAY, Weizmann Institute of Science, LIANG DAI, University of California, Berkeley, MATIAS ZALDARRIAGA, Institute for Advanced Study, SETH OLSEN, Princeton University, HORNG SHENG CHIA, Institute for Advanced Study — In this talk I will describe a novel framework to characterize the population of binary black holes using detections of arbitrary significance. I will quantify the information gain from the inclusion of marginal events and introduce a theoretical bound on the information content of the astrophysical stochastic background, derived with this framework. I will report constraints on the distributions of merging binary black hole masses, spins and rate derived from detections from the first two LIGO-Virgo observing runs, including those identified by our group, and how these get updated with results from the recent third observing run.

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