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Stochastic Gravitational Waves in the Advanced Detector Era

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Second-generation gravitational-wave detectors such as Advanced LIGO and Advanced Virgo are scheduled to begin taking data by 2015. An expected ten-fold improvement in strain sensitivity, along with a broader observing band, will enable a wealth of astronomical observations including the possibility of direct detection of the stochastic gravitational-wave background. The stochastic background arises from the superposition of many unresolvable gravitational-wave sources. Measurements of the stochastic background probe cosmic history by providing information about ensembles of distant sources. We report on the prospects for detection of the stochastic background with advanced detectors, the science we can extract from stochastic measurements, and the characterization of correlated noise in global networks of gravitational-wave detectors (an important source of potential systematic error).

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