

The next generation of gravitational-wave detectors

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The current generation of gravitational-wave detectors have provided a wealth of information from coalescences of binary black holes and binary neutron stars. However, even at design sensitivity these detectors are only able to observe coalescences from the local universe, out to redshifts of a few. In contrast, the next generation of longer and more sensitive gravitational-wave detectors, such as Einstein Telescope and Cosmic Explorer, will detect binary coalescences throughout the entire universe, out to redshifts well beyond 10. Additionally, these next-generation detectors will detect nearby coalescences with exquisite signal-to-noise ratios, enabling precision tests of general relativity and nuclear physics. I will discuss the science goals and technological challenges for this next generation of detectors.

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