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Science of continuous gravitational wave signals: periodic waves and the stochastic background

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We are at the threshold of a new era in astronomy and astrophysics, the era of gravitational waves. The LIGO-Virgo gravitational-wave detectors have achieved phenomenal sensitivities and recently completed a two year data taking run. A new run is underway with an enhanced hardware configuration—a crucial stepping stone toward next generation gravitational-wave detectors. In this talk I will discuss the latest results of searches for periodic gravitational waves from spinning neutron stars. I will also review the results of searches for the stochastic background of gravitational waves, which could be cosmological or astrophysical in origin. I will give sensitivity projections for the current run and next generation gravitational-wave detectors, and assess their impact on astronomy and cosmology.

¹for the LIGO Scientific Collaboration and the Virgo Collaboration