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The Bright Future of Gravitational Wave Astronomy

GABRIELA GONZALEZ, Louisiana State University

These are exciting times in the search for gravitational waves. Gravitational waves are expected from many different astrophysical sources: brief transients from violent events like supernova explosions and collisions of neutron stars and black holes, coalescence of compact binary systems, continuous waves from rotating systems, and stochastic signals from cosmological origin or unresolved transients. The LIGO gravitational wave detectors have achieved unprecedented sensitivity to gravitational waves, and other detectors around the world are expected to reach similar sensitivities. The LIGO Scientific Collaboration (LSC) has recently completed their most sensitive observation run to date with LIGO and GEO detectors, including several months of joint observations with the European VIRGO detector. The LIGO Laboratory and the LSC, as well as the Virgo Collaboration, are actively preparing for operating enhanced detectors in the very near future. The next decade will see the construction and commissioning of Advanced LIGO and VIRGO, and quite possibly the launch of the space-based LISA mission, starting for sure then, if not earlier, a new era for gravitational wave astronomy. Plans for a world-wide network of ground based detectors involving more detectors in Europe, Japan and Australia are becoming more concrete. The future of gravitational wave astronomy is bright indeed! In this talk, will briefly describe the present status of the ground and space based detector projects and discuss the science we may expect to do with the detectors (and detections!) we will have in the upcoming era of gravitational wave astronomy.