

Gravitational Wave Astronomy

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Gravitational wave detectors in the U.S. and Italy will soon yield their first direct detections, providing population statistics of stellar-mass compact binaries, testing General Relativity at unparalleled precision, and possibly probing the neutron star equation of state. Future space-based detectors will advance our understanding of galaxy formation history, produce detailed maps of the space-time geometry around supermassive black holes, and yield a thorough survey of ultra-compact binaries in our Galaxy. I will give an update on the LIGO experiment, review the science capabilities of existing and future detectors, and highlight some of the techniques used for extracting signals (and their associated astrophysical parameters) from the data.