Gravitational Waves and Multi-Messenger Astronomy

Abstract:
Gravitational waves are produced by a wide variety of sources throughout the cosmos, including the mergers of black hole and neutron star binaries, compact objects spiraling into central black holes in galactic nuclei, close compact binaries, and phase transitions and quantum fluctuations in the early universe. Observing these signals can bring new – and often very precise -- information about their sources across vast stretches of cosmic time. In this talk we will focus on the opening of this gravitational-wave window on the universe, highlighting new opportunities for discovery and multi-messenger astronomy.