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Gravitational Wave Observations Expected from the Transient Gravitational Wave Sky

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A new observational era in gravitational wave astronomy is poised to begin in this decade, with the upcoming start of Advanced LIGO and Advanced Virgo: the direct detection of gravitational wave transients promises new insights into the engines powering some of the most energetic astrophysical events. In this talk, I will outline the path towards their detection with the second generation of gravitational wave interferometers, with focus on gravitational wave transients: coalescences of neutron star and/or black hole binary systems, core-collapse supernovae, isolated neutron star instabilities. I will discuss the open analysis challenges, the prospects for astrophysical inference and the potential for multi-messenger astronomy with combined information from the electromagnetic and neutrino sectors.