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The Exploding Sky: Prospects for Transient Gravitational-Wave Astronomy

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In 2015 the first Advanced LIGO gravitational-wave antennas will begin observing the sky, followed shortly by Advanced VIRGO, and in the years thereafter by KAGRA and LIGO-India. What might this international network see? To be detectable, gravitational-wave sources must radiate enormous amounts of power, and the most promising are short lived, cataclysmic, events: the collisions of neutron stars and black holes. When matter-bearing neutron stars are involved, electromagnetic radiation from the collision should also be detectable across a wide range of energy bands and over many different time scales. To capture the information carried by this wave of radiation and increase our physical understanding of the sources, a network of electromagnetic transient observers are partnering with LIGO and Virgo. I will review some of the emission mechanisms that are anticipated and what we might learn from joint GW-EM observations.

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