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Abstract for an Invited Paper
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Invited Review: Status Current Understanding of Optical counterparts to GW events

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The detection of the gravitational wave (GW) source GW170817 and its associated electromagnetic (EM) signals has illuminated the physics of merging neutron stars and addressed long standing questions as to the origin of the heaviest elements. I will review our physical understanding of mergers and the origin of EM emission, describing how observations of a radioactively powered optical/infrared counterpart (a "kilonova") allow us to probe the physical properties of the merger and its remnant and decode the signatures of heavy elements at their production site. I'll highlight the successes and limitations of kilonova modeling, and anticipate what we may see and learn in a hopeful future of numerous, diverse joint GW+EM detections.