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Dynamics of compact object mergers

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Advanced LIGO's first detection of gravitational waves (GWs) from merging black holes has opened a new window to the Universe. The observation of neutron-star (NS) mergers is imminent and promises far-reaching implications. We will describe the dynamics of NS mergers focusing on the postmerger dynamics. In particular, we will point out the implications for matter ejection from these events. Neutron-rich outflows from NS mergers are invoked to explain the still mysterious origin of heavy elements which are formed through the rapid neutron-capture process. The nuclear decays in these ejecta power electromagnetic counterparts which are potentially observable. We will describe the properties of these transients within a multi-messenger picture including in particular information that can be revealed from simultaneous GW detections.