

Title: Neutron star mergers: a source of gravitational waves, r-process elements, and electromagnetic transients

Abstract: Merging binaries containing two neutron stars (NSs) or a NS and a black hole (BH) are primary candidates for direct detection in gravitational waves by ground-based interferometers such as Advanced LIGO. These mergers are also thought to be an important site of r-process element generation. Simultaneous detection of gravitational waves with an optical or infrared (IR) counterpart would greatly aid in the localization of these sources, improving parameter extraction from the gravitational wave signal and providing additional information about the system. I will discuss the processes that generate electromagnetic emission in a compact object merger. In particular, I will describe a research program aimed at predicting the properties of a supernova-like optical/IR transient powered by the radioactive decay of r-process elements (a "kilonova").