

Rebecca Surman – Colloquium – April 5, 2018

Title: The astrophysical origins of the heaviest elements

Abstract: The origin of the heaviest elements has long been one of the greatest mysteries of nuclear astrophysics. The only known means to synthesize nuclei up to uranium and thorium is rapid neutron capture, or r-process, nucleosynthesis, and exactly where and how the r-process occurs has remained uncertain for decades. Recently disparate lines of evidence---from astronomical observations, modeling of galactic chemical evolution and individual astrophysical events, neutrino and nuclear experiment and theory, and gravitational wave detections---appear to be converging on a preferred site of production: neutron star mergers. Here we will review the available evidence and discuss the role nuclear physics can play in a definitive resolution to this mystery.