

APR07-2007-000429

Abstract for an Invited Paper  
for the APR07 Meeting of  
the American Physical Society

**Compact white dwarf binaries as sources of gravitational waves**

DANIEL STEEGHS, Harvard-Smithsonian Center for Astrophysics

Interacting binaries involving a compact stellar remnant produce the bulk of the energetic objects found in our galaxy. But such compact systems are also expected to make a dominant contribution to the galactic gravitational wave emission. I will briefly summarize the formation and evolution of such systems and focus on the dominant source population: binaries containing white dwarfs. Depending on the makeup of the two stars in the binary, some are expected to merge on short timescales, others can exchange mass for giga-years, and yet others may be able to detonate the white dwarf to produce a Type Ia supernova. Efforts are underway to survey the galaxy and provide a census of the compact binary population using a variety of wavebands. These include large optical surveys of the galactic plane, the large number of sources identified through their X-ray emission as well as serendipitous discoveries in extra-galactic surveys such as the SDSS. These surveys allow us to both identify individual systems, but also provides important constraints on the unresolved background emission from all these binaries. Our multi-wavelength arsenal of telescopes allows us to characterize such sources and derive crucial system parameter estimates such as the masses and compositions of the stars. I illustrate recently identified systems with orbital periods of only minutes that are expected to be the strongest galactic sources of gravitational waves that will be crucial for facilities such as LISA.