

Abstract Submitted  
for the APR07 Meeting of  
The American Physical Society

**Astrophysical constraints on BH-NS and NS-NS mergers and short GRBs** RICHARD O'SHAUGHNESSY — Gravitational-wave detectors are expected to observe binary mergers in the near future, improving on our understanding of compact binary formation and evolution. In this talk we describe the range of merger rates expected from state-of-the-art population synthesis models for the Milky Way; we summarize existing observational constraints in the Milky Way; and we describe how constraints improve our understanding of binary evolution, using existing (electromagnetic) and expected future (gravitational-wave) observations. However, because long delays can occur between binary birth and merger and because most star formation occurred long ago, binaries born long ago in old elliptical galaxies can also contribute significantly to the present-day merger rate. Using recent results on the cosmological census and star formation history, we summarize the presently plausible range of LIGO detection rates. Though these additional uncertainties complicate astrophysical interpretations of LIGO detections, we suggest that additional observations of short GRBs and of merging binary parameter distributions can reduce the associated ambiguity and allow gravitational-wave observations to significantly constrain binary evolution.

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Date submitted: 12 Jan 2007

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