

Project Title:

Gravitational Waves and Gamma Ray Bursts

Supervisor(s):

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Project Description:

Gamma Ray Bursts (GRBs) are extremely energetic, short lived, bursts of gamma rays typically originating in distant galaxies. They are classified in two groups, long and short, believed to be caused by, respectively, the collapse of massive stars and the merger of neutron stars. Since both of these processes would emit gravitational waves, nearby GRBs are excellent candidate sources. Over the past decade, the Cardiff gravitational physics group has led the implementation and execution of joint gravitational wave-GRB searches. We have also investigated the astrophysical implications of joint observations.

In late 2015, the advanced LIGO detectors began their first observational run. The advanced Virgo detector is expected to come online next year and both will evolve to their full sensitivities over by the end of the decade. During that time, we are likely to witness the first observation of gravitational waves associated with a GRB.

This project will involve leading the effort to search for gravitational waves associated to Gamma Ray Bursts, as well as understanding the expected implications of the search – both in the presence and absence of an observed gravitational wave. It will involve running the analysis on the advanced LIGO and Virgo data and interpreting the results. Throughout, the project will require close collaboration with other gravitational wave and gamma ray astronomers.

To discuss this project further, please contact:

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