

MDPH480/PHYS480/ASTR480/MAPH480 Research Projects 2009

Project Title: R Coronae Borealis – the most enigmatic group of stars

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Abstract of the Proposed Research (use this page only)

There is a rare group of chemically and physically peculiar stars that hold the key to understanding the final phase of the evolution of many millions of stars. These stars are known by the initial member of this class and are called the R Coronae Borealis stars. In our Milky Way Galaxy there have been only several hundred identified – out of 100 billion stars. In our nearest neighbour galaxies, the Magellanic Clouds, there may be even fewer of this class of star. But by their rarity they will provide a key link between more normal phases of the evolution of stars.

Their unusual chemical make-up and their large, but unpredictable, variation in light output over a period of weeks makes them the most enigmatic group of stars in the universe. They go through this light variation many times in their lifetime, as opposed to the “one-off” supernova explosions.

The research proposed here will acquire data of this class of star in the Galaxy and the Magellanic Clouds to examine their chemical make-up and to explore the nature of the light output variations that are due in part to the obscuration of the star by a cloud of carbon-based compounds. Overall light output and also spectroscopic observations will be obtained and analysed to determine the properties of the stars themselves, as well as the local environment around each of these stars that has been polluted by the dusty material ejected periodically by these stars.

Background reading:

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