

Title of Project: **Probing spectroscopic signatures in Globular Cluster stars**

Project Number:

University Project Leaders/Departments: Professor Peter Cottrell; Physics and Astronomy

Brief outline of project

We are in an era of surveys and large data samples that lead to statistically significant samples to test stellar evolution and stellar nucleosynthesis yield theories. These evolution and nucleosynthesis theories are the fundamental building blocks for our understanding of the distribution of the nuclides throughout the Universe after the formation of the first stars. The very old, densely populated, objects known as globular clusters that reside in our own Galaxy, and in other nearby galaxies, offer a source of such large samples of stars and also a range of chemical environments.

We have available various spectroscopic datasets and continue to acquire new data via the University of Canterbury's guaranteed access to data from the Southern African Large Telescope (SALT). With these data the summer scholar will determine the abundance of a range of key elements (for example C, N, Fe, Zr, Ba) required to get an understanding of the current and past chemical environments in these stars and consequently in their host globular clusters.

The specific aims for the spectral data will be to find the effective temperature, surface gravity and a range of elemental abundance by comparing the observed data with spectra computed with existing computer codes for these purposes.

Specific student requirements:

Please indicate below any specific academic requirements you have for the summer scholarship student (e.g., specific level; specific courses, or equivalents, completed)

The ideal summer scholar would be a senior undergraduate or recently completed Honours student with an interest in applying their physics, chemistry, astronomy and/or mathematical skills to a research project. Specific requirements/preference:

- some astronomy/astrophysics knowledge through university courses, preferably at 3rd year
- good computational skills
- student who has completed BSc (or equivalent) would be preferred

Special condition:

n/a