Shrouding and Star-Planet Interactions in Close-Orbiting Exoplanet systems

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**Description:**
Our OU-SALT spectroscopic survey of the host stars of close-orbiting exoplanets has revealed statistical evidence that both shrouding by ablated planetary material and boosting of chromospheric emission occur. This PhD project will build on these findings in two ways: (i) by extending the survey to newly-discovered planet hosts, including host stars of low mass transiting planets revealed by TESS. (ii) Performing follow-up studies of the most interesting systems revealed by the survey.

The student(s) will contribute to:
- Planning and executing observations with the 10-meter SALT telescope, of which the OU has a small share of ownership.
- Photometric investigations, including using space-based facilities e.g. TESS, CHEOPS, HST, to find transits and determine stellar rotation periods.
- Transmission spectroscopy to measure the composition of the gas ablated from the close-in planets
- Investigations of star-planet interactions
- Measuring the properties of the host stars using new and archival observations
- Data analysis and paper-writing
- Presenting results at national and international exoplanet conferences

The work is likely to include travel to observatories, including the facilities of the European Southern Observatory in Chile and the South African Astronomical Observatory in the western Roggeveld Mountains in the Karoo, South Africa.

There may also be opportunities to become involved in planning for ESA’s ARIEL mission, which will perform spectroscopy of transiting exoplanets.

**References:**

   Experimental Astronomy DOI: 10.1007/s10686-018-9604-3
Qualifications required:

Degree in physics, astrophysics or closely-related subject at 2:1 MPhys or better. Programming experience is highly desirable. Interest in and background knowledge of exoplanetary research is desirable.