**PhD position in Physics at Warwick University - Investigating the nature and origins of planets in the Neptunian Desert**

Dr David Armstrong

**Overview**

We invite applications from outstanding and highly motivated students for the Warwick Prize Scholarships in Astrophysics. The successful applicant will work with [Dr David Armstrong](https://warwick.ac.uk/fac/sci/physics/research/astro/people/armstrong/) within the [Astronomy and Astrophysics group](https://warwick.ac.uk/fac/sci/physics/research/astro/) in the Department of Physics at the University of Warwick.

**This project will explore the nature of rare, dense Neptune-sized planets found orbiting at extreme temperatures.**

The Neptunian desert is a known feature of the exoplanet population - Neptune-size and mass planets are not found orbiting close to their host stars. This is due to photo-evaporation and tidal disruption, where planets are evaporated by intense radiation or even completely disrupted by gravitational tides. Despite this, the NASA TESS mission has recently found several planets in the desert. These planets are abnormally dense, with densities the same and higher than the Earth despite being the size of Neptune. Understanding their origins requires a dedicated observational program, seeking to understand:

* 1) How common are these desert planets?
* 2) Are these outliers or a new population of previously unseen planets?
* 3) What processes lead to these planets. How do they form and evolve?

The project is funded by a UK Frontier Research Grant (previously an ERC grant) and come with increased funding duration and travel allowance.

Warwick is an internationally recognised centre of research excellence. Our group takes leading roles in many major ground and space-based projects, including the Gravitational-wave Optical Transient Observer (GOTO), Next Generation Transit Survey (NGTS), PLAnetary Transits and Oscillations of stars (PLATO) telescope, Sloan Digital Sky Survey (SDSS), WHT Enhanced Area Velocity Explorer (WEAVE) spectrograph, 4-metre Multi-Object Spectrograph Telescope (4MOST), and Dark Energy Spectroscopic Instrument (DESI).

The Astronomy & Astrophysics group is part of the Physics Department at Warwick; both the department and the university hold Athena SWAN Silver awards, a national initiative to promote gender equality for all staff and students. The Physics Department is also a Juno Champion, which is an award from the Institute of Physics to recognise our efforts to address the under-representation of women in university physics and to encourage better practice for all. The Astronomy & Astrophysics group also hosts monthly [equitea](https://warwick.ac.uk/fac/sci/physics/research/astro/seminars/equitea/) forums to break down barriers faced by all under-represented groups in science.

More details on PhD positions with the Astronomy and Astrophysics group at Warwick are available [here.](https://warwick.ac.uk/fac/sci/physics/research/astro/postgraduate_phd/)

Start Date: October 2023

Funding Duration: 4.0 years

Applications due by: 10 January 2023

**Eligibility**

You must have or expect a First or Upper second class MSci, MPhys or equivalent degree in Physics or a closely related discipline. Holders of BSc honours degrees are eligible but successful BSc applicants typically have substantial additional research experience. International equivalents are detailed [here](https://warwick.ac.uk/study/international/admissions/entry-requirements/).

For students whose first language is not English, we normally require a score of 6.5 in IELTS or equivalent. If your previous degree was taught in an English-speaking country this requirement may be waived.

The award is available to home and international applicants.

**How To Apply**

You must apply through the [University’s online application system](https://warwick.ac.uk/study/postgraduate/apply/research/) and follow the instructions. Use course code P-F3P0. Make sure to state an interest in the Astronomy and Astrophysics group. Please state ‘Warwick Prize Scholarships’ as the funding option. We encourage applicants to express interest in more than one [available PhD project.](https://warwick.ac.uk/fac/sci/physics/research/astro/postgraduate_phd/)

**Funding Notes**

The project will provide a full UK-standard annual tax-free stipend of £18,200, rising with inflation, plus allocations for travel and computing.