



Postgraduate Scholarships in the High Energy Physics, Cosmology & Astrophysics Theory (HEPCAT) group at the University of Cape Town (UCT)

The High Energy Physics, Cosmology & Astrophysics Theory (HEPCAT) group in the Department of Mathematics and Applied Mathematics at the University of Cape Town (UCT) is offering Postgraduate scholarships funded by the South African Research Chairs Initiative (SARChI) of the National Research Foundation for 2025. We will consider excellent candidates for Honours, MSc and PhD.

The research priorities of the grant for 2025 are on the science of the HIRAX experiment, understanding Fast Radio Bursts (FRBs) and the cosmological implications of FRBs, pulsars physics and pulsar timing arrays, using gravitational waves as probes of gravitational theory and more broadly on theoretical cosmology and multimessenger astrophysics. We also have the potential to supervise a student with an interest in axions and chameleon gravity to work on the IAXO experiment. Students with interests in any of these areas are encouraged to apply.

The HEPCAT group was established around the South African Research Chair in Physical Cosmology held by Amanda Weltman. Group members conduct research on a wide range of theoretical physics, cosmology and astrophysics problems, with a particular focus on connecting observation and theory. Our faculty members include Shajid Haque, Jeff Murugan, Jonathan Shock, Marisa Geyer and Amanda Weltman.

There are additional opportunities to perform joint work across all group research areas, theoretical cosmology, radio cosmology, pulsar science, axion and chameleon searches, machine learning in astrophysics, to name a few. The HEPCAT group is involved with a range of external collaborations, including surveys on MeerKAT, especially related to pulsar and transient science and discoveries (Meertime and TRAPUM), IAXO, the upcoming SKA working groups and the HIRAX experiment. These will allow interested students to engage with international researchers from European, Australian, UK, Canadian and American institutes. We will consider candidates with a range of interests related to cosmology, gravity and high energy theory.

The appointment must comply with the University's approved policies, procedures and practices for the postgraduate sector, and is subject to the rules, approval and funding levels of the University of Cape Town and the National Research Foundation of South Africa.

Academically excellent students who have completed/are completing an undergraduate or Honours/Masters Degree, which is relevant to the focus areas for 2025, may apply. While preference will be given to South African citizens and permanent residents, exceptional foreign students who can bring a unique skill to the group will also be considered, provided they are registered at the University of Cape Town on a full-time basis.

The value of a PhD scholarship is up to R188 820 per year.

The value of an MSc Scholarship is up to R182 836 per year.

The value of an Honours Scholarship is up to R163 892 per year.

Equipment and travel funding will be provided where relevant for the training.

Cape Town is an extremely beautiful city, surrounded by natural beauty. With beaches, mountains and forests only a short way from the city centre, Cape Town offers a perfectly balanced cosmopolitan lifestyle.

Interested students should send a CV, a statement of your research interests (2 pages max) and academic transcripts, as well as arrange for 2-3 letters of recommendation to be sent to melissa.largier@uct.ac.za. Please use the following format in the subject line: YOURNAME, Postgrad 2025. The positions are available for the 2025 academic year. The deadline for full consideration is 2 July 2024.

The University of Cape Town reserves the right to:

- *disqualify ineligible, incomplete and/or inappropriate applications*
- *change the conditions of award or to make no awards at all*