

North-West University Centre for Space Research



Graduate Studies in Astrophysics and Space Physics



- **Astrophysics**
Gamma-Ray, Optical, and Radio Astronomy;
High-energy Astrophysics; Star Formation;
Galaxy Evolution
- **Space Physics**
Heliospheric Physics; Cosmic-Ray Transport;
Turbulence; and Particle Transport
- **Antarctic Research**
Cosmic-Ray Detectors
- **Physics in Application**
Particle Detectors; Low-noise Amplifiers;
Intelligent Spark Plugs



Programs of Study

- **Honours in Astrophysics / Space Physics**
 - Classical Mechanics
 - Quantum Mechanics (I + II)
 - Electrodynamics
 - Plasma Physics
 - Statistical Mechanics
 - Computer Physics
 - Research Project (I + II)
 - **M. Sc.**
 - Astrophysics (I + II)*
 - Transport Theory*
 - Heliospheric Physics*
 - General Relativity*
 - Capita Selecta*
 - M.Sc. Dissertation
- * Students choose any three of these courses in consultation with the research director. The Dissertation is compulsory.

- **Ph.D.**
 - Ph.D. Dissertation in Astrophysics or Space Physics



Bursaries

- **Honours:**
At least ZAR 70,000 p.a.
 - **M.Sc.:**
At least ZAR 75,000 p.a.
 - **Ph.D.:**
At least ZAR 106,000 p.a.
- Guaranteed minimum amounts, tax free.

Topics in Astrophysics



- **Gamma-Ray Astronomy:**
Gamma-Ray Observations with the High-Energy Stereoscopic System (H.E.S.S.) in Namibia, the world's leading gamma-ray observatory.
- **High-Energy Astrophysics**
Pulsars; supernova remnants; micro-quasars; active galactic nuclei; gamma-ray bursts
- **Star Formation and Radio Astronomy**
Radio Observations of star-forming regions; theory of masers
- **Galaxy Evolution**
Optical Observations of galaxies and stellar populations

Topics in Space Physics

- **Heliospheric Physics**
Solar physics; cosmic-ray transport in the solar system
- **Cosmic-Ray Physics**
Cosmic-ray transport in interstellar and interplanetary space; diffuse emission from cosmic-ray interactions
- **Turbulence**
Simulations of interplanetary turbulence and particle transport

Antarctic Research



- Cosmic-ray measurements (neutron monitors)

Physics in Application

- Technology developments: Mini neutron monitors; low-noise amplifiers; intelligent spark plugs

Research Facilities

- High Energy Stereoscopic System (H.E.S.S.)
- Hartebeesthoek Radio Astronomy Observatory
- KAT-7 / MeerKat / SKA (Square Kilometre Array) Radio Observatories
- SALT and other SAAO telescopes
- South African National Antarctic Expedition (SANAE) Research Station
- Centre for High Performance Computing (CHPC)
- Space Exploration Missions (Voyager, Ulysses, Pamela and others)

How to Apply

Send:

- Application letter
- Transcripts from former institutions
- Statement of Research Experience (if applicable) and Research Interests

To:

Mrs. Elanie van Rooyen
Centre for Space Research
Private Bag X6001
Potchefstroom, 2520
E-mail: Elanie.vanRooyen@nwu.ac.za

Pre-selected candidates will be invited for an interview at the Potchefstroom Campus of NWU.

Application Deadline:
October 31 (for admission in January)

Inquiries:

General program inquiries:

Prof. S. Ferreira (Stefan.Ferreira@nwu.ac.za)
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Astrophysics:

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Space Physics:

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