



Space Physics Research @ ukzn

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Space Physics @ UKZN

- Operate under the banner SPARG (Space, Plasma and Atmospheric Research Group)
- Has a long history coming from the ex-Natal University, in particular and Plasma Physicists at ex-UDW.
- Both experimental and theoretical research.

Space Physics in the Charged Space Environment

- Interests extend from the Ionosphere to the magnetosphere
- Have three primary groups:
 - (i) SHARE
 - (ii) Theoretical Space Plasma Physics.
 - (iii) VLF group

Space Physics in the Charged Space Environment: SHARE

- HF Radar at the SANAE base in Antarctica.
- Part of the SUPERDARN network.
- Interests include:
 - (i) Ionospheric Convection studies.
 - (ii) Magnetic field models and mapping of field lines.
 - (iii) Pulsation studies.

Space Physics in the Charged Space Environment: Space Plasmas

- Primarily centred on waves and instabilities in space environment.
- Studies include:
 - (i) Ring-current distributions.
 - (ii) Effect of nonthermal charged particle distributions, such as kappa.
 - (iii) Electron-positron plasmas.
 - (iv) Dusty Plasmas

Space Physics in the Charged Space Environment: VLF Group

- Operate VLF receivers in Antarctica; Marion Island; Durban.
- Also lightning detection equipment.
- Long history of studies of Whistler and Chorus events.
- More recently focussed on lightning studies.

Space Physics in the Neutral Space Environment: LIDAR

- Recommissioning the LIDAR.
- Focus on troposphere to the thermosphere.
- Atmospheric modelling studies, such as studies of gravity waves; temperature profiles of upper atmosphere; bulk flows of matter in the upper atmosphere.

Person-Power & Collaborations

- 6 Mainstream Academics.
- 4 active Emeritus professors.
- Several well-established international collaborations.
- Just over 15 MSc/PhD students
- Strong links with the HMO and NLC.