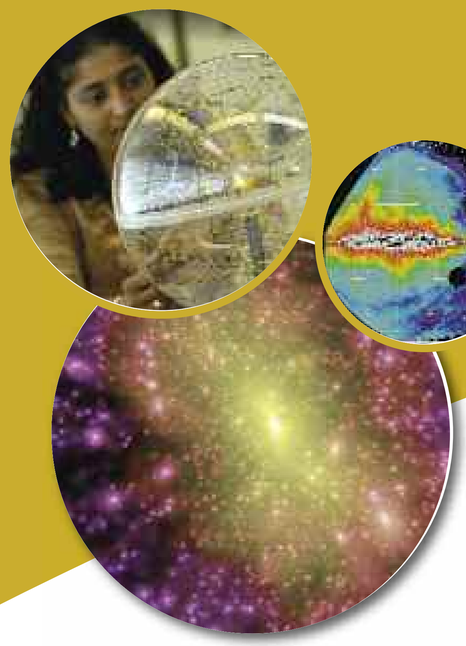
WANTED

BRIGHT YOUNG MINDS

to take on the challenges of constructing, operating and supporting a 21st century radio telescope

MeerKAT needs YOU

- South Africa is building **meerKAT**, one of the world's premium mid-frequency telescopes, near Carnarvon in the Northern Cape Province
- We're also on the shortlist to site a mega telescope, the **Square Kilometre Array**
- These telescopes require cutting-edge, mission driven innovation solutions
- We need **astronomers** and a wide range of **highly-skilled astrophysicists, engineers and technicians** to help us deliver meerKAT and the SKA



MeerKAT Science

We need **radio astronomers** to work on meerKAT science objectives, including research questions such as:

- How have stars and galaxies evolved over the last five billion years?
- What is the cause and effect of cosmic magnetism?
- What is the nature of transient radio sources?
- What can pulsars tell us about the laws of physics?

MeerKAT, and in future the SKA, will address many more fundamental and hugely exciting questions in astrophysics, physics, cosmology and astrobiology, including the search for extraterrestrial life!

The meerKAT site

We need **electrical, civil, mechanical and logistics engineers** to:

- Establish roads, water, power and other infrastructure to a remote site
- Compare the cost-effectiveness of on-site vs off-site manufacturing of the telescope components

We need **mechanical and electronic technicians** to:

- Deal with supply chain and asset management around a huge area in a remote part of South Africa
- Maintain each antenna dish in perfect working order
- Maintain the electronics and computer systems
- Keep costs of site, operations and maintenance to a minimum

The meerKAT array

We need **structural and civil engineers** to:

- Design and optimise the construction of a low cost radio telescope to fulfill many different science objectives

We need **system and electronic engineers** and **astronomers** to:

- Define the science requirements of the telescope
- Translate user requirements into engineering requirements
- Investigate and identify the optimal layout of the dishes to maximise science outputs

We need **radio frequency engineers** to:

- Reduce radio frequency interference from sources such as cellular phones; broadcasting and air travel on the sensitive meerKAT receivers
- Protect against future radio frequency interference

MeerKAT's antennas, feeds and receivers

We need **civil and mechanical engineers** to:

- Develop a high-precision instrument that can detect weak radio signals from outer space and track celestial objects accurately
- Design and manufacture durable dish antennas and pedestals
- Design the feed and receiver components to be sensitive and accurate
- Find innovative manufacturing solutions and alternative materials to build the telescope at the lowest possible cost

We need **electronic, software, digital and radio frequency engineers** to:

- Identify antennas, mounts, feeds and receivers that cover the required frequency range and that maximise field of view
- Produce low noise amplifiers more sensitive than ever before
- Filter out interfering signals from man-made sources without compromising any celestial radio signals
- Develop front-end signal processing instrumentation
- Develop complex algorithms to convert radio signals into images of the observed astronomical object

MeerKAT Operation and Control

We need **electronic and software engineers** and **computer scientists** to:

- Develop software to monitor and control the telescope from a remote high-performance computing centre
- Develop multi-terrabit communication links for data transport between the instrument at the site and the control centre
- Ensure consistent, high-performance computing systems
- Develop, implement and maintain data mining and data archiving systems
- Develop, implement and support software systems
- Find the most cost-effective solutions for all aspects of operation and control

COULD ONE OR MORE OF THESE CHALLENGES BE FOR YOU?

MeerKAT offers postgraduate bursaries to students who excel in their studies and are interested to join research teams at the cutting edge of technology. Applications close on 31 August for study in the following academic year. Application forms at www.ska.ac.za

SKA · Department of Science and Technology · NRF National Research Foundation · SKA South Africa · meerkat karoo array telescope

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Go to **www.ska.ac.za** for more on: • The science of the SKA and MeerKAT • SKA and MeerKAT locations • SKA and MeerKAT news, educational resources • SKA and MeerKAT bursary programme