

The National Astrophysics and Space Science Programme



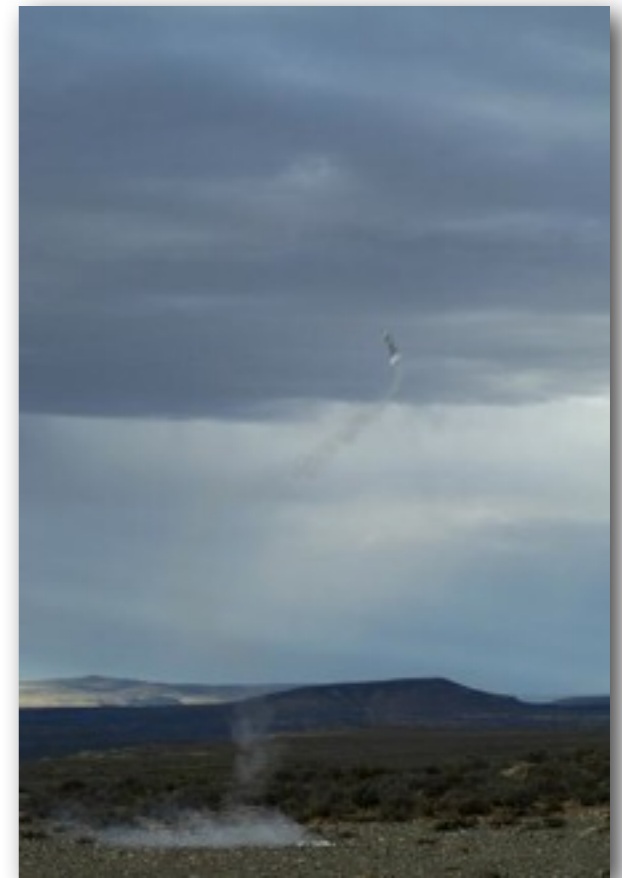
NASSP

<http://www.star.ac.za>

Programme Origins

Idea originated in 2000 during an NRF strategic planning exercise and programme launched in 2003.

- * Lack of local (extreme lack of black) astronomers is the major threat to the future of SALT and astronomy in general.
- * The lack of high level skills in science & technology is major national problem.



Our Mission and Vision

Mission:

To provide students with the skills, knowledge and inspiration to embark upon a PhD in astrophysics or space science within South Africa or abroad, or to enter and contribute to the South Africa work force, where mathematical skills and an understanding of research methods will give them an edge.

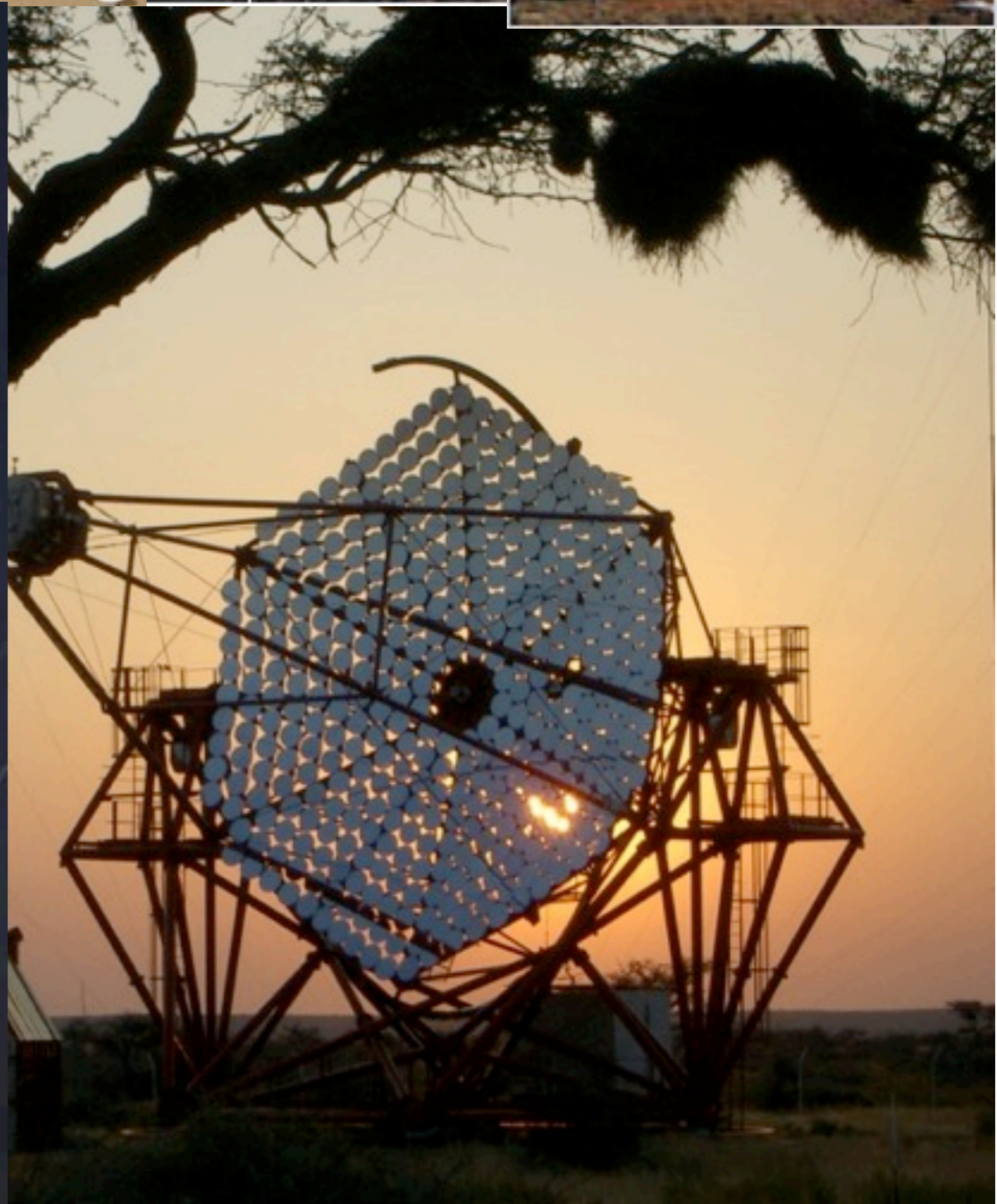
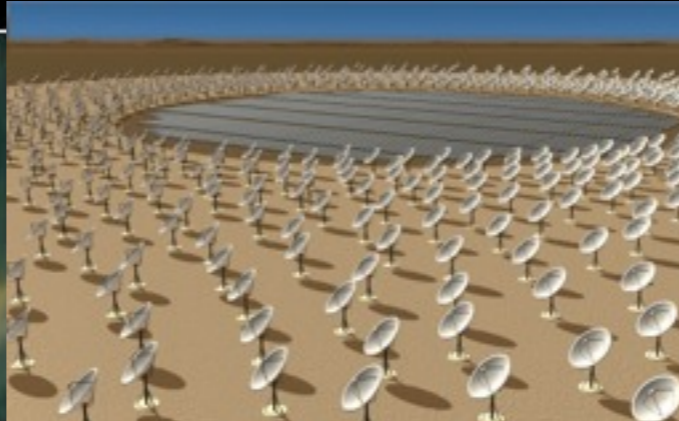
Vision:

To produce an international network of African astronomers, space scientists and citizens bonded by the common experience of schooling and interlinked both professionally and personally.



SKA SOUTH AFRICA

SQUARE KILOMETRE ARRAY



The NASSP Partnership

Host: University of Cape Town

Directed by Peter Dunsby (until July 2013).

Managed by local EXCO which reports to a national steering committee chaired by Patricia Whitelock until January 2013. Currently chaired by Roy Booth.

Partners Universities:

North West (Potchefstroom and Mafekeng), Rhodes, KZN, Free State, Johannesburg, Western Cape, Zululand, UNISA, Wits

Partner Research Facilities (originally NFs of NRF):

SAAO, HartRAO, SKA SA, SANSA Space Science

USA involvement through NSBP and Kellogg Foundation



How NASSP Works

- * Involve all SA astronomy/Space Science institutions in teaching
- * Recruit from 3rd year undergraduate physics/maths, engineering
- * Honours + MSc programmes
- * Recruitment from elsewhere in Africa but preference is given to South African students first.
- * All students located on one site
- * Emphasis on skills (computing, communication etc.)
- * Sensible and attractive bursaries (DST)
- * Students register at host (UCT) for honours (1 yr), but at home institution of supervisor for MSc - with 6 months at UCT as 'occasional' students for course work.
- * Extended honours has been operational since 2008

NASSP Research Projects

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NASSP 2012 Research Projects

Project Listings:
[> Honours Projects](#)
[> Masters Projects](#)
[> PhD Projects](#)

Honours Projects

> Please click on a project title to see expanded project details.

Project Title	Supervisor	Email	Organisation
Radio Spectroscopic Investigation of the Star-forming Region G188.95+0.82	Michael Gaylard	Email Supervisor	HartRAO
The case for incorporating Volume Phase Holographic Gratings in Phase III of the SAAO Cassegrain Spectrograph Upgrade	Lisa Crause	Email Supervisor	SAAO
Eclipsing mCVs with SALT	Encarni Romero Colmenero	Email Supervisor	SAAO/SALT
SALT Spectroscopic Study of the Strongest Lenses Discovered in Herschel-ATLAS	Lerethodi Leeuw	Email Supervisor	University of Johannesburg
Eclipsing mCVs with SALT	Stephen Potter	Email Supervisor	SAAO
Environments of interacting star-forming galaxies	Petri Vaisanen	Email Supervisor	SAAO/SALT
Painting colours onto simulated galaxies	Andreas Faltenbacher	Email Supervisor	UWC
SALT spectroscopy of galaxy cluster MS1054-03	Natasha Maddox	Email Supervisor	UCT
Barrel Balloon Campaign	Andrew Collier	Email Supervisor	SANSA / UKZN
Statistical Analysis of Traveling Ionospheric Disturbances (TIDs) over South Africa	Zama Katamzi	Email Supervisor	South African National Space Agency (SANSA) Space Science
Gravitational lensing by exotic spacetimes	Jeandrew Brink	Email Supervisor	National Institute of Theoretical Physics, Stellenbosch
Investigating the reported outburst of a magnetic cataclysmic variable star	Hannah Worters	Email Supervisor	SAAO
The electron-acoustic instability in a magnetized plasma	Shimul Mahraj	Email Supervisor	SANSA Space Science
COLOR AND MORPHOLOGY OF GALAXIES IN THE EVLA HI DEEP FIELD PILOT SURVEY	Claude Carignan	Email Supervisor	UCT
...	Andrew	Email	...

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NASSP 2012 Research Projects

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[> PhD Projects](#)

Masters Projects

> Please click on a project title to see expanded project details.

Project Title	Supervisor	Email	Organisation
Star formation rate at redshifts <1	Alexei Kniazev	Email Supervisor	SAAO/SALT
Large-Scale Structures and Flow Fields in the Zone of Avoidance	Renee Kraan-Korteweg	Email Supervisor	Astronomy Department (ACGC), University of Cape Town
In search of binary central stars of planetary nebulae	Brent Miszalski	Email Supervisor	SAAO/SALT
KELT-South Exoplanet Survey	John Menzies	Email Supervisor	SAAO
The VISTA of Magellanic Cloud Planetary Nebulae	Brent Miszalski	Email Supervisor	SAAO/SALT
Constraining the Star Formation Rate Density in dwarf galaxies at z=1-1.5	David Gibbank	Email Supervisor	SAAO
The characterization of onset times and duration of geomagnetically induced currents (GICs) in the South African power network.	Pieter Cilliers	Email Supervisor	SANSA Space Science
Evidence of Star Formation : Luminosity Dependence of PAH emission features in Lenticular Galaxies	Sudhanshu Banway	Email Supervisor	SAAO
Constraining red giant models via observed pulsation properties.	Enrico Olivier	Email Supervisor	University of the Western Cape
A New Look at the Far-infrared/Radio Correlation	Mattia Vaccari	Email Supervisor	UWC
The Vela Overdensity - does it provide the missing link to explain the local flow fields	Renee Kraan-Korteweg	Email Supervisor	Astronomy Department (ACGC), University of Cape Town
CRAB NEBULA RADIO-OPTICAL CORRELATIONS IN THE CRAB NEBULA FILAMENTS	Michael Bietenholz	Email Supervisor	HartRAO
The characterization of the drivers of geomagnetically induced currents (GICs) in the South African power network.	Pieter Cilliers	Email Supervisor	SANSA Space Science
SALT Fabry-Perot observations of planetary nebula haloes	Shazrene Mohamed	Email Supervisor	SAAO

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More than 80 projects submitted in 2012

Major Challenges

- * Attracting black SA students (EHP, Winter School)
- * Joint Degree - NASSP as national programme
- * Low standards of (physics) education in SA
- * Balancing the curriculum:
- * Space physics and astrophysics
- * Theory and Observation
- * Optical and Radio - multi-wavelength
- * Content and Skills
- * Disparity of skills of new students depending on where they come from
- * Astronomy, IT, practical experience
- * Growing the numbers (Southern node now saturated)



Outcomes (Honours programme)

- 159 students registered between 2003 and 2011.
 - 17 students registered for 2012.
 - 9 extended honours registered for 2012.
- * Of the 159 students graduated since 2003
- 42 Women,
 - 39 South African black,
 - 57 African black,
 - 43 South African white.
 - 1 Other

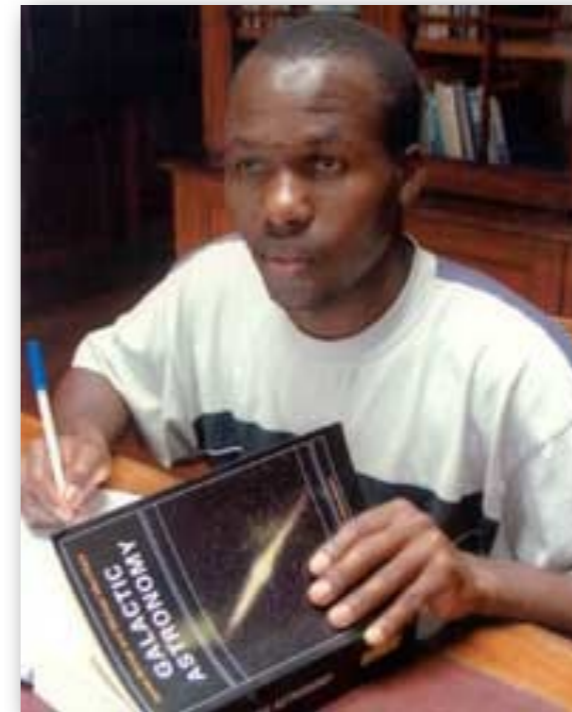


Outcomes (Masters programme)

- 134 students registered between 2003 and 2011.
- 16 students currently registered for 2012.
- 85 graduated, 8 PhD upgrades, 27 are currently completing thesis, 9 completed coursework only

* Of the 85 students graduated since 2003

- 21 Women,
- 14 South African black,
- 46 African black,
- 25 South African white,
- 2 Other,
- 25 PhD graduates,
- 45 currently studying for a PhD.



After NASSP.....

What are students doing after they graduate?

- * 25 PhD graduates,
- * 45 currently studying for a PhD. } 82% of students completing MSc
- * 2 permanent faculty in SA (UCT, UKZN)
- * Postdoctoral fellows (including Caltech, Princeton, Yale, ICRAR and Oxford)
- * SANSA
- * SKA office
- * Industry



The Future of NASSP

- * NASSP is crucial to the future of Astronomy and Space Science in South Africa.
- * Develop additional NODES - NASSP North....
- * Legislative Framework: real national programme? A good start has been made with the finalization of an MOU between the host (UCT) and UFS.
- * NASSP courses should be made available to Physics Honours Programmes around the country.
- * Use of video conferencing, podcasting and other delivery technologies - iTunes University. In 2012, two Honours courses were podcast to students with materials made available within 15 minutes of every lecture.
- * The EHP is a major component of the NASSP curriculum and needs to be grown further.
- * African students and their funding?
- * Should space physics/science be a separate programme?
- * If "yes" should we share some courses?
- * Should students specialize at honours, e.g. Theory, space physics, extragalactic, planetary science etc?
- * Do we want to be more like AIMS (all 3 week courses)?

