

OVERVIEW OF ASTRONOMY LANDSCAPE IN SA



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science
& technology

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Development of Astronomy in SA

- Optical Astronomy as the front runner
 - ❑ SAAO with smaller telescopes and investments -
- nearly 200 years
 - ❑ SALT with significant investment and bigger impact - 15 years
- Radio Astronomy
 - ❑ HartRAO - 50 years old
 - ❑ KAT7, MeerKAT and SKA and AVN - huge investment and huge impact - 10 -15 years
- Participation in HESS, Namibia – 10-15 years
- Multiwavelength approach



Evolution of Astronomy in SA ?

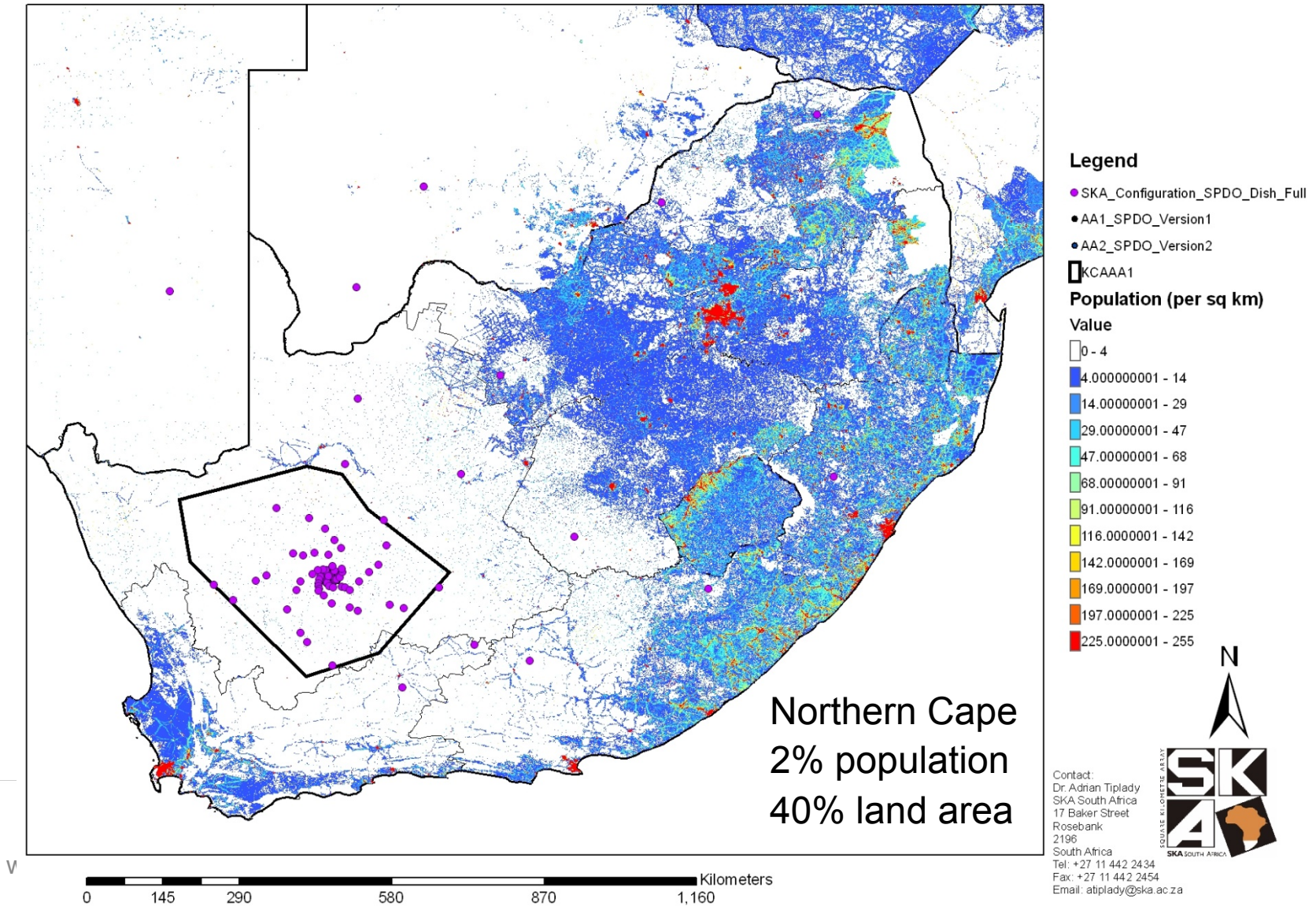
- White Paper, 1996: *“It is also important to maintain a basic competence in flagship sciences such as physics and astronomy for cultural reasons.....”* - *Astronomy and Astrophysics have been maintained and expanded as a flagship basic science area*
- National R&D Strategy 2002: *“We should develop scientific areas where there is an obvious geographical advantage such as astronomy,.....”* - *The Astronomy Advantage Area (AGA) Act no. 21 of 2007 protect the Karoo site as an Astronomy Reserve*
- TYIP 2008-2018: - *“The development of a space technology programme provides an opportunity to use satellites to conduct astronomy observations from space (Telescope mounted satellites).....”* - *This has not been pursued to date*
- *“We should become the preferred destination for major astronomy projects and associated international investment in construction and operations”* - *SA (and Africa) has become an emerging hub for astronomy with projects such as SALT, MeerKAT/SKA, AVN and HESS. New investments include HERA and other small telescopes in Sutherland*
 - *“We will have constructed a powerful radio-astronomy telescope and used it for world-class projects”* - *Construction of MeerKAT and SKA is underway and on track*



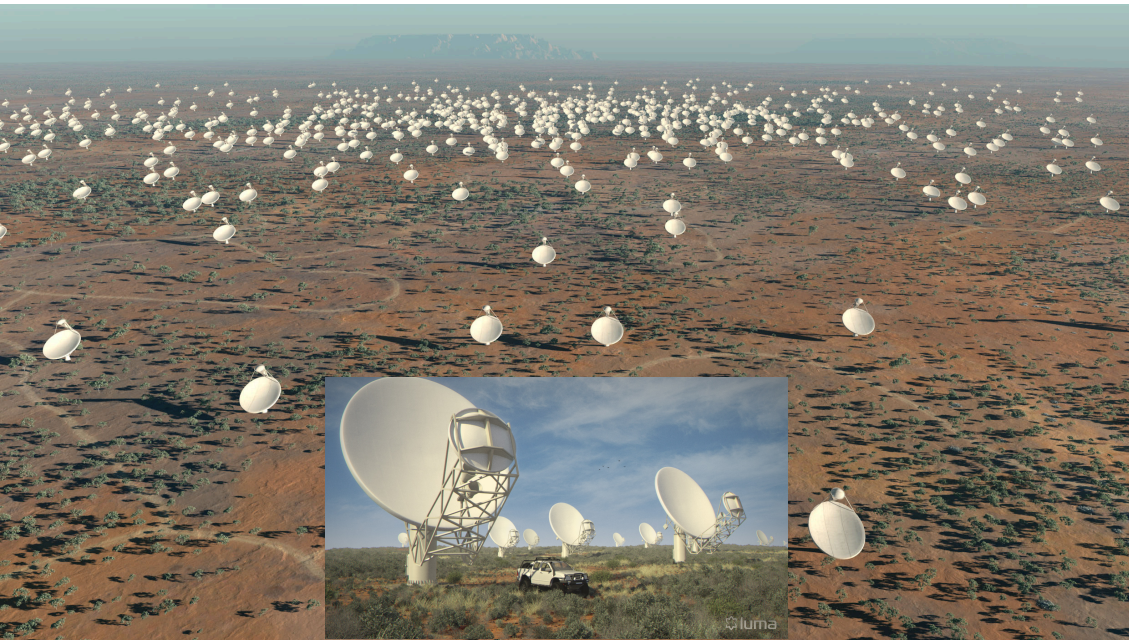
Highlights of key achievements to date ?

- Approval of the Multi-wavelength Astronomy (MWA) Strategy and Implementation Plan in 2015
- Scientific outputs/impact have grown from below average to twice above the global average – global ranking in astronomy increased from 33 to 21
- Size of astronomy community has more tripled over the last 10-15 yrs from 60 astronomers to about 200 and pipeline is increasing very fast
- Significant HCD programme through SKA Bursary Programme and NASSP
- Catalyst in the NSI through various Big Data initiatives such as IDIA, graduate degree at Sol Plaatjie Univ, etc
- Involvement of industry through commercial spin-offs, localisation and innovations (e.g. ROACH board)
- African development (IAU-OAD office, AVN programmes, institutional capacities, etc)
- International partnerships and diplomacy tool

Population Density (and RFI)



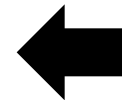
SKA in Africa and Australia



← Africa (mid-frequency)



Australia (low-frequency
+ mid-survey)





SKA Phases and Dates

- Precursors (MeerKAT and ASKAP) start science about 2016, merge into SKA1 about 2020
- SKA pre-construction (design and prototype) 2013-2016
- Prototypes on the ground 2016
- Tenders for construction of SKA Phase 1 (SKA1) in 2017
- Construction of SKA1 from 2018-2023
- Early science with (part of) SKA1 from 2020
- Design of SKA2 from 2018-2021
- Construction of SKA Phase 2 (SKA2) 2023-2028?
- SKA2 infrastructure probably earlier (2021-2022?)



The President visits SIP 16

- SKA & MeerKAT = Special Infrastructure Project 16
- Presidential Infrastructure Coordination Commission





Community Projects

- e-school initiative – cyberlabs at school
- Schools teachers empowerment programme
- Bursaries for children from surrounding towns
- Community knowledge centre
- Several guest houses employing people and tourism slowly on the increase
- Astro-tourism route and products
- Proposed SKA tourism/science visitor centre





SKA African Ministerial Forum



African Ministers attend MeerKAT inauguration



Nkutunse Dish - Ghana





Challenges

- Lack of transformation - an NRF Astronomy HCD /Transformation group has been established to address these issues
- Disparities between optical and radio astronomy
- Consolidation of the astronomy community
 - SARA0 underway
 - Astronomy Institute
- Maximising contributions and impact to NSI
- Dealing with broader socio-economic issues and community expectations around the SKA



Annual Budget Allocations

- Annual Astronomy Budgets
- NRF Transfers
 - ❑ SKA Capital/Operations - R652m
 - ❑ AVN - R 10m
 - ❑ HESS Participation (Gamma Ray) - R3m
 - ❑ R26m - budget retained at DST Astronomy
- NRF Budget Vote
 - ❑ SAAO/SALT - R100m
 - ❑ HartRAO - R30m
 - ❑ RISA - R25m
- Total Astronomy Budget (system wide) - R846m





THANK YOU

