

Welcome to the SAAO



Petri Vaisanen
SAAO Director

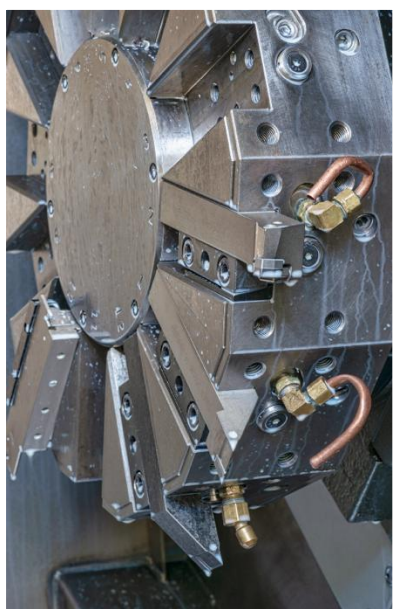


South African Astronomical Observatory National Facility of the NRF



South African Astronomical Observatory National Facility of the NRF

- Research. Technology Development. Training. Science engagement/impact*



The core of African optical / IR astronomy is in Sutherland



Southern African Large Telescope SALT

The largest optical telescope (11m aperture) in the
Southern Hemisphere, multi-partner consortium

11 years in science operations

Full *service* mode
and *remotely* operable



Multi-wavelength and multi-messenger astronomy



SAAO Science Focus:

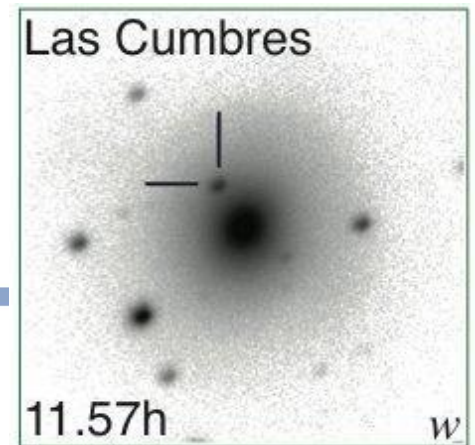
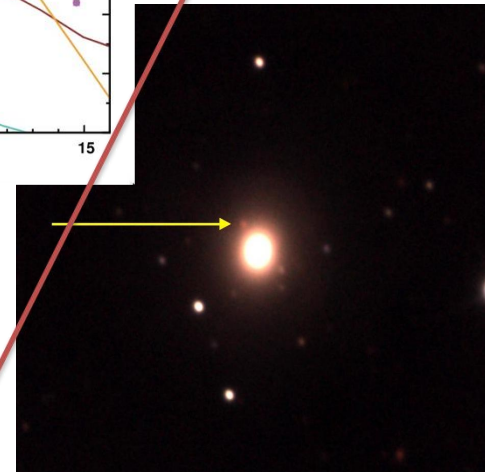
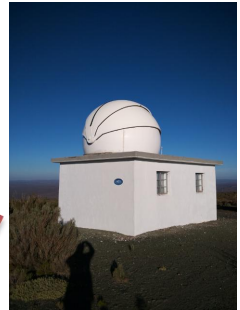
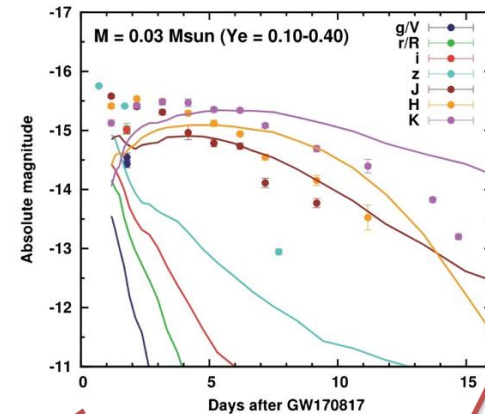
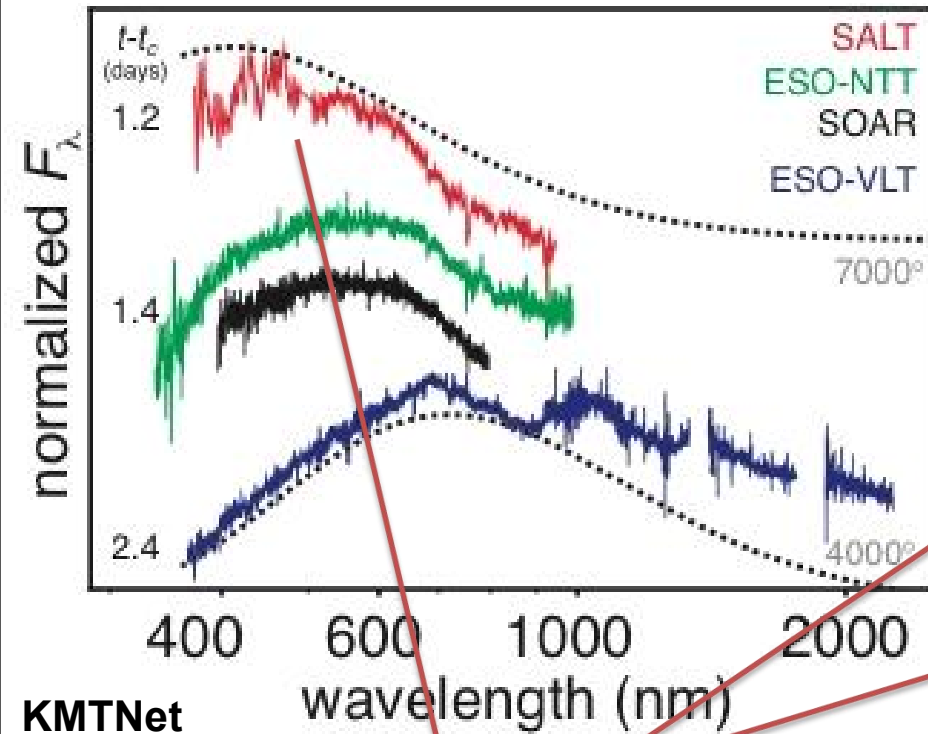
- Transient Astronomy
- Galaxy evolution
- Solar system and exo-planets



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Birth of multi-messenger astronomy



Sutherland Telescopes

(our own, or guest with SA access)

SALT ; 1.9 m ; 1.0 m ; Lesedi (1.0m)

imaging, med/high-R spect., high speed modes, MOS, FP, im/spec polarimetry, wide field imaging

IRSF

KMTNet

MONET

Las Cumbres (LCO)

SOLARIS

MASTER

MeerLICHT

ASAS-SN

SuperWasp

KELT-South

SANSA

Bison

ATLAS (2021)

PRIME (2022)

Japanese 1.4m IR imaging / polarimetry

Korean 1.6m 2° field exoplanet search

German 1.2m planet search & teaching

USA 3x 1m optical robotic

Polish 2x 0.5m exoplanet search, **new 1x 1.0m (2021)**

Russian 2x 0.45m transient search

Dutch, UK, South African, 0.65 m shadows MeerKAT

USA + International transient search

UK exoplanet search

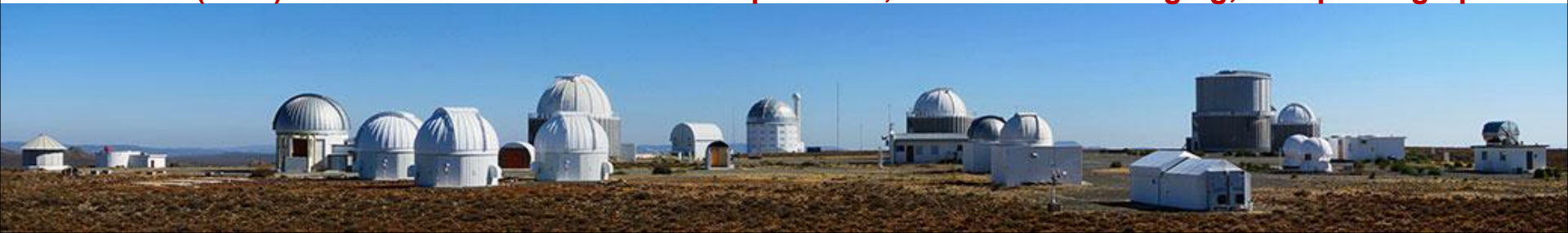
USA exoplanet search

South African space debris, atmosphere

UK solar telescope

USA 0.5m near Earth asteroids and transient search

Japan 1.8m, wide field NIR imaging; HR spectrograph

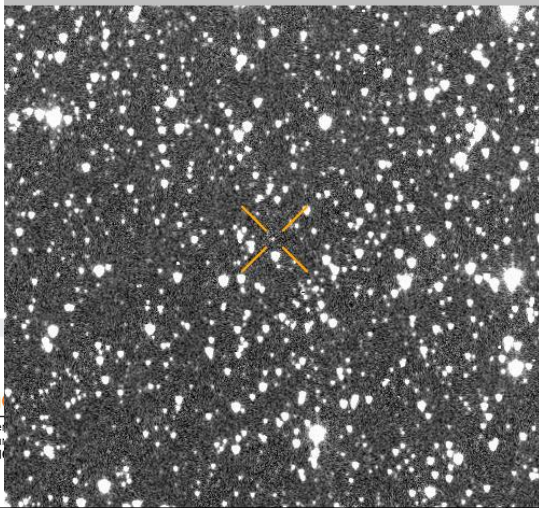


31 Jan Minister Nzimande welcomes South Africa's hosting of NASA-funded Hazardous Asteroid Tracking Telescope

Posted at 11:00h in News, Press Releases

ATLAS 0.5-m –

[Asteroid Terrestrial-impact Last Alert System]



PRIME 1.8-m – New Japanese infrared telescope

Exo-planet science:

VERY wide-field NIR imager, and high-res NIR spectrograph



Make the whole mountain top a Giant Transient AI machine - *4IR project* **The 'Intelligent Observatory'**



Make the whole mountain top a Giant Transient AI machine - *4IR project* **The 'Intelligent Observatory'**

- Goals
 - Coordinated rapid response science across telescopes in the era of multi-messenger astronomy

- Steps
 - **Remotely operable telescopes**
 - Service mode operations
 - Robotic capabilities
 - Networked autonomous ops

Success of 2020/21/22

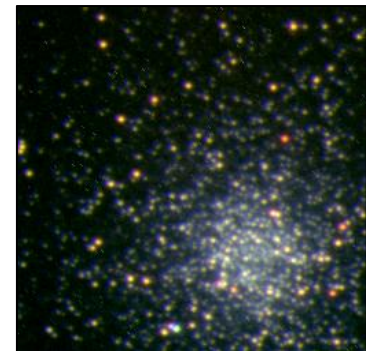
SALT and SAAO Operations from Cape Town & around the world, throughout the COVID-19 period



Make the whole mountain top a Giant Transient AI machine - *4IR project* **The 'Intelligent Observatory'**

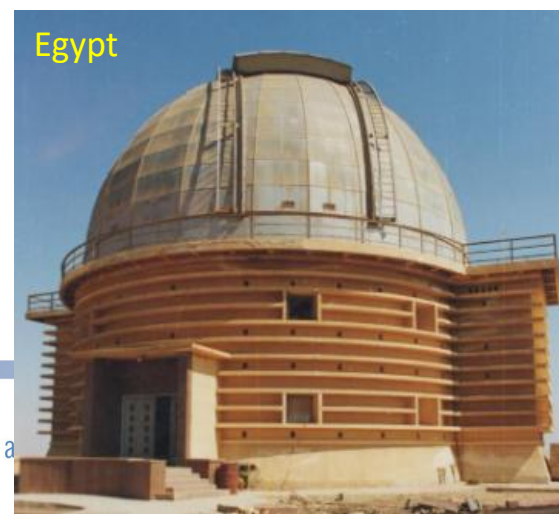
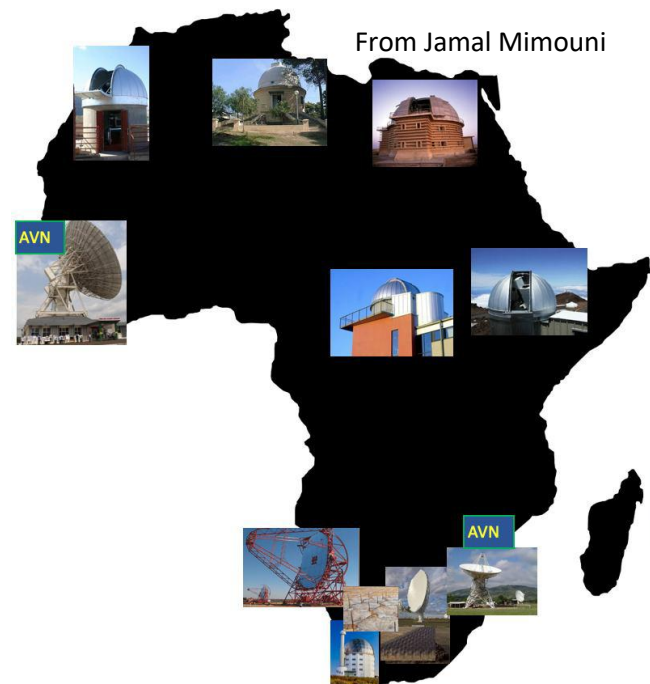
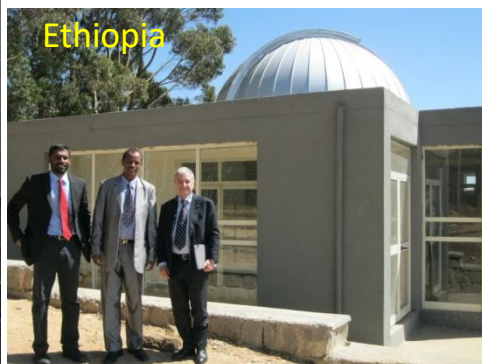
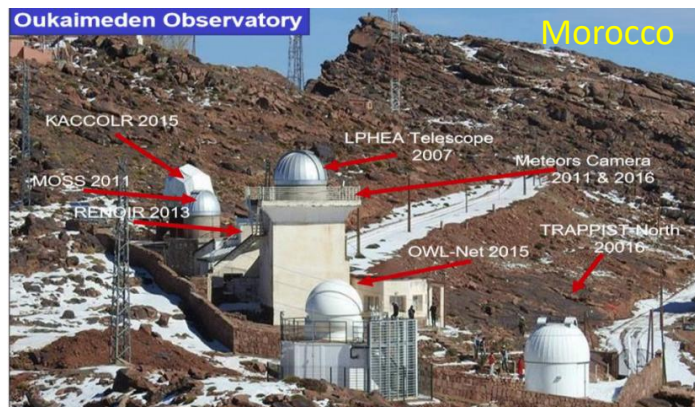
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*Recently, FULLY
AUTONOMOUS* observations
with Lesedi and old 1.0m.
Imaging AND spectroscopy



The Future: An African-wide Network

- ❖ Expand *Intelligent Observatory* concept into Africa
- ❖ Use existing facilities networked together
 - South Africa
 - Morocco
 - Algeria
 - Egypt
 - Ethiopia
 - Burkina Faso

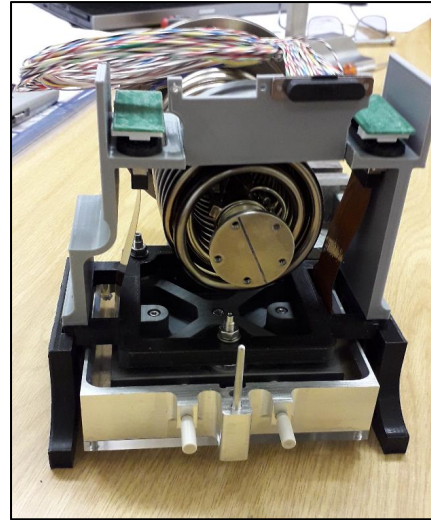
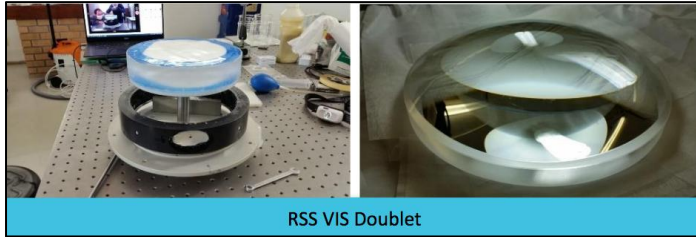


- ❖ Develop international collaborations, build on LARGE surveys
- ❖ Motivate for development of new facilities

Recent/New Instrumentation projects

RSS RED (MAX-E) and VIS detector packages and lenses, etc.

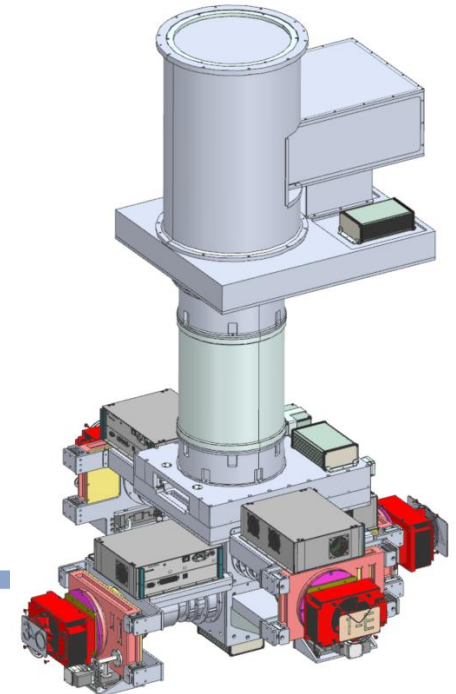
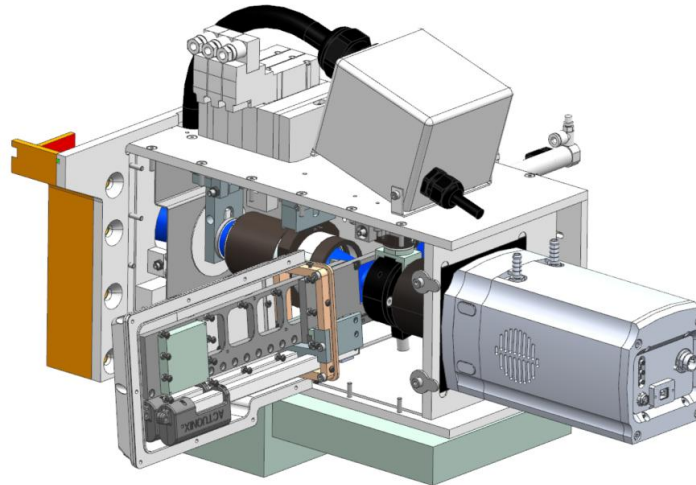
SII project with SAAO



WALOP-South (IUCAA - India) for the 1.0-m manufactured at SAAO

Mookodi – low resolution spectrograph for *Lesedi* commissioned in 2021

Sibonise – SAAO's widest field-of-view camera installed on *Lesedi* telescope



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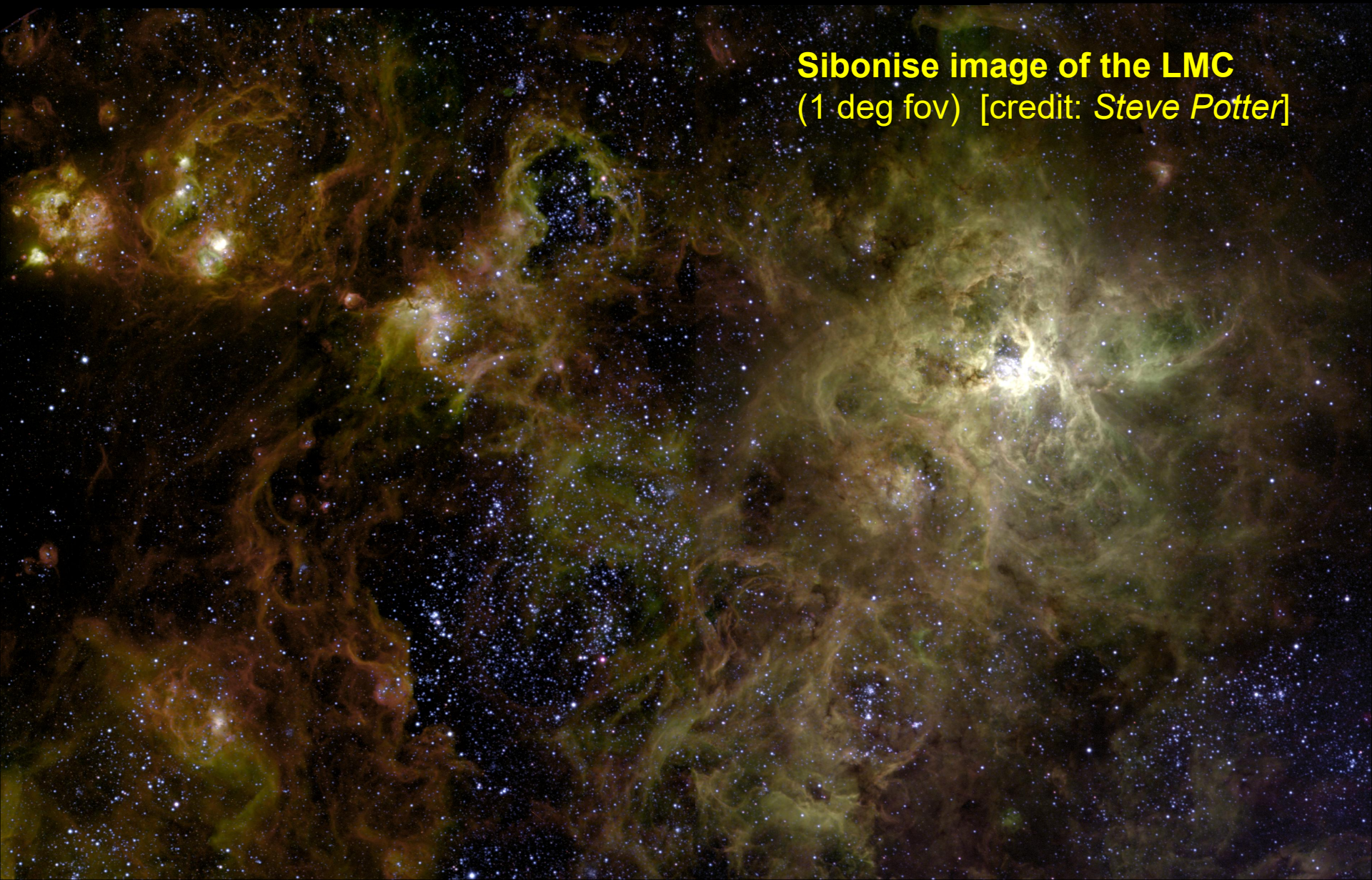
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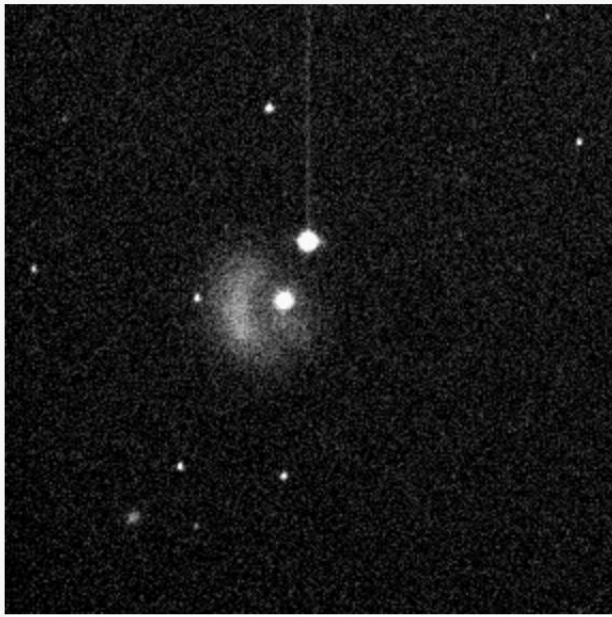
BEYOND 200 YEARS OF ASTRONOMY

Recent/New Instrumentation projects

Sibonise image of the LMC
(1 deg fov) [credit: *Steve Potter*]

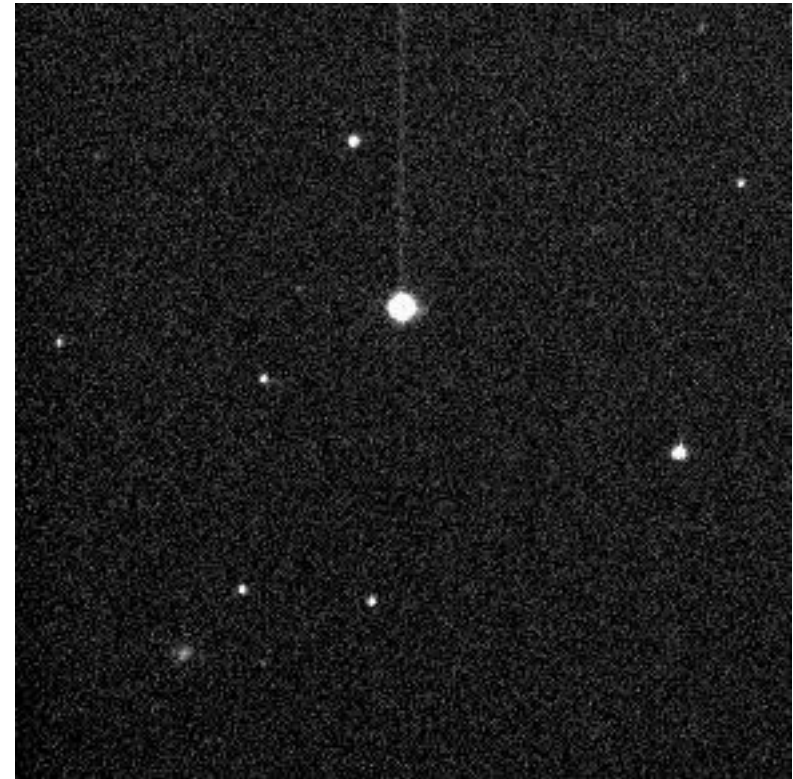






SAAO Telescopes observe the first successful redirection of an asteroid

The National Aeronautics and Space Administration (NASA) has announced that the orbital period of the asteroid Dimorphos around its parent asteroid Didymos has successfully been altered after it impacted with the Double Asteroid Redirection Test (DART) spacecraft at 1:14 am SAST on 27 September 2022,.....



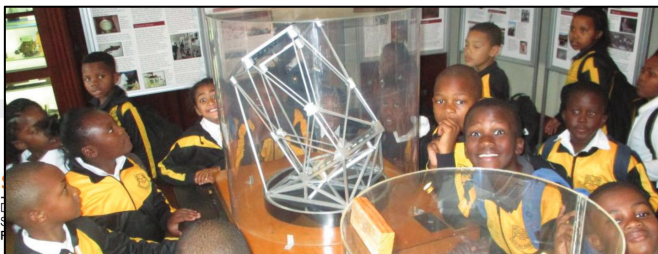
Credit: Nic Erasmus
[SAAO/Lesedi/Mookodi]

Education/Outreach & Astro Tourism

- ❖ *Open Nights*, Public lectures, stargazing sessions, and exhibitions
- ❖ Tourism in Sutherland driven by SAAO/SALT. Visitors' Centre. Tours. Stargazing
- ❖ Sutherland community engagement – multiple ways
- ❖ Empowerment of math & science teachers
- ❖ Collaboration with Provincial Education Departments and Science Centers
- ❖ Career awareness among learners, workshops, events, etc.
- ❖ National competitions: *Astro Quiz* and *Robotics Competition*



Could we collaborate more with ASSA?
How? Astro-tourism efforts?





n/Outreach & Astro Tourism

lectures, stargazing sessions, and exhibitions

New Cape Town Visitors' Centre



IAU General Assembly 2024

5 – 16 August 2024

Cape Town, South Africa

www.astronomy2024.org



XXXII IAU GENERAL ASSEMBLY

CAPE TOWN, SOUTH AFRICA, 2024



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Advancing knowledge. Transforming lives. Inspiring a nation.





Impact of another 100yr old
astronomical society personal





Good luck ASSA for the next 100yrs!
& Looking forward to engagement

