



SAAO

South African
Astronomical Observatory

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SAAO Research Abstract

Founded in 1820 and located in the leafy Southern suburbs of Cape Town, The South African Astronomical Observatory (SAAO) is the national centre for optical and infrared astronomy in South Africa.

Its prime function is to conduct fundamental research in astronomy and astrophysics. It does so by providing a world-class facility to scientists. The observatory is run by the National Research Foundation of South Africa. The primary telescopes are located in Sutherland, which is 370 kilometres from Observatory, Cape Town, where the headquarters is located.

The SAAO has links worldwide for scientific and technological collaboration. Instrumental contributions from the South African Astronomical Observatory include the development of a spherical aberration corrector and the Southern African Large Telescope (SALT).

The Southern African Large Telescope (SALT) is the largest single optical telescope in the southern hemisphere and among the largest in the world. It has a hexagonal primary mirror array 11 metres across, comprising 91 individual 1m hexagonal mirrors.

SALT is funded by a consortium of international partners from South Africa, the United States, Germany, Poland, India, the United Kingdom and New Zealand. The telescope has been in full science operation since 2011 and is realising its huge potential as Africa's Giant Eye on the Universe.

The SAAO also promotes astronomy and astrophysics in Southern Africa, by sharing research findings and discoveries. Every year the SAAO reaches out to thousands of learners and members of the general public. Among others we are hosting school groups, offer visitors a look at the telescopes in Sutherland and invite the public in Cape Town to Open Nights twice a month.



Aerial view of the SAAO Campus in Cape Town

Research at SAAO

The SAAO is involved in a diverse array of astronomical research, with more than 20 telescopes residing on the Sutherland plateau. Some of the main focus areas of our research are stellar astronomy, extragalactic astronomy, planetary science as well as exoplanets and transient science.

South Africa has had a long and rich history of stellar astronomy, indeed the first ever measurement of the distance to a star (Alpha Centauri) was made here in 1833. Today we continue this tradition, working on multi-wavelength observations and numerical simulations of a wide range of stellar systems including:

- transients e.g., novae and supernovae;
- interacting binaries e.g., cataclysmic variables, symbiotic and X-ray binaries;
- variable stars e.g., pulsating red giants, flare and R CrB stars;
- exoplanets.

The SAAO is also exploring a diverse range of topics in extragalactic astronomy, including studies of:

- luminous and ultraluminous infrared galaxies and interacting galaxies in the local universe,
- nearby lenticular galaxies,
- cosmology using supernovae in distant galaxies, galaxies in clusters and the effects of their environment,
- galaxy mergers and galaxies in close pairs,
- the changes in galaxy populations out to high redshifts.

We have an active, professional planetary science research group at the SAAO. The work is currently primarily focused on small bodies in Solar System. In particular, we study trans-Neptunian object dynamics and colors, observe and analyze stellar occultations by trans-Neptunian objects (especially Pluto), and measure asteroid colors.

The SAAO is currently very interested in transient events such as the 2017 gravitational wave event in which SALT played a critical role and we are in the process of upgrading various instruments on SALT and installing a totally new spectrograph which will position us well in terms of transient follow-up and the search for habitable exoplanets.



Observatory in Sutherland

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