



Advanced Techniques at the EOS Space Research Centre

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EOS Space Research Centre



The EOS Space Research Centre [SRC] is a globally distributed research facility dedicated to research into space tracking, astronomy, space debris and optical communications.

EOS SRC telescopes operate on 3 continents, and affiliated facilities are located world-wide and in orbit.

Mount Stromlo is the largest concentration of research capability.

SRC Programs



The Stromlo campus of the EOS SRC operates unclassified programs for:

- *Optical communications [quantum encryption and interplanetary link testing]*
- *Astronomy*
- *Adaptive optics*
- *Laser tracking*
- *Laser propulsion*

Examples of SRC program effort follow.

The EOS Space Research Centre. The 2m test system is in [L] rear, the SLR facility in foreground, and the DIMM tower at [R].



Astronomy



SRC has large scale infrastructure for the investigation of:

- *Telescope tracking. 100 nrad systems technology originates from this effort.*
- *Synthetic aperture optical systems. EOS has built 100m effective aperture systems, and larger apertures will arise from SRC research effort.*
- *Ultra-large telescope technology [to 50m aperture]. SRC equipment allows trade studies into various design solutions for the next generation of optical telescopes.*

Adaptive Optics



EOS is a major producer of large-scale adaptive optics systems. To support this activity, EOS researches laser guide star technology at the Stromlo SRC facility.

- *Solid-state 589 nm lasers and sum-frequency generation of 589 nm.*
- *Laser guide star intensity and sodium layer profiling [southern hemisphere]*
- *Correlation of results with “seeing” with DIMM data to allow system parameters to be resolved.*

Laser Tracking



SRC laser tracking programs are focussed on laser tracking of space debris for precise collision orbits.

- *First debris tracks in 2000*
- *Laser tracking of any catalogue item for collision avoidance [eg ISS or shuttle] using precise orbits*
- *Technology enhancement for laser, telescope, detector and control systems/software.*

SRC effort has provided every breakthrough in this new technology.

Laser Ablation



EOS is currently funded for the development of space propulsion using laser ablation.

This technology was developed by EOS and is now being refined for 2006 deployment of a large-scale technology demonstration at SRC.

The program aims to be able to modify debris orbits by 2007 as a means of collision avoidance.

Announcement of Opportunity: SRC Collaborations



- *EOS' unique SRC infrastructure of scientists, lasers, telescopes, and support is available to international science collaborations.*
- *Research proposals seeking facility access and/or EOS funding can be submitted to EOS at any time.*