

## Telescope Tip-Tilt Secondary Mirror

The tip-tilt secondary mirror on the ANU 2.3 m telescope

- Measures and adjusts image position at 30 Hz
- Corrects image blur produced by turbulence in the Earth's atmosphere
- Both the tip-tilt secondary mirror and the 2.3 m telescope were designed and constructed by RSAA

## Design and Construction Capabilities

RSAA regularly designs and constructs scientific instruments that integrate precision mechanical, optical, and cryogenic systems with electronic control systems and low noise optical CCD and near-infrared detector systems.

### Specific design and construction capabilities include:

- Design and manufacture of specialized optics
- Aluminium mirror coatings up to 1.9 m diameter
- Spectrograph design and manufacture
- CNC milling from CAD drawings
- Clean room facilities
- CCD and NIR detector systems
- Mechanism control systems
- Design of surface mount multi-layer circuit boards
- System level support for Unix/Solaris platforms
- Programming in C, C++, Fortran, Java, Perl, Tcl

### Associates

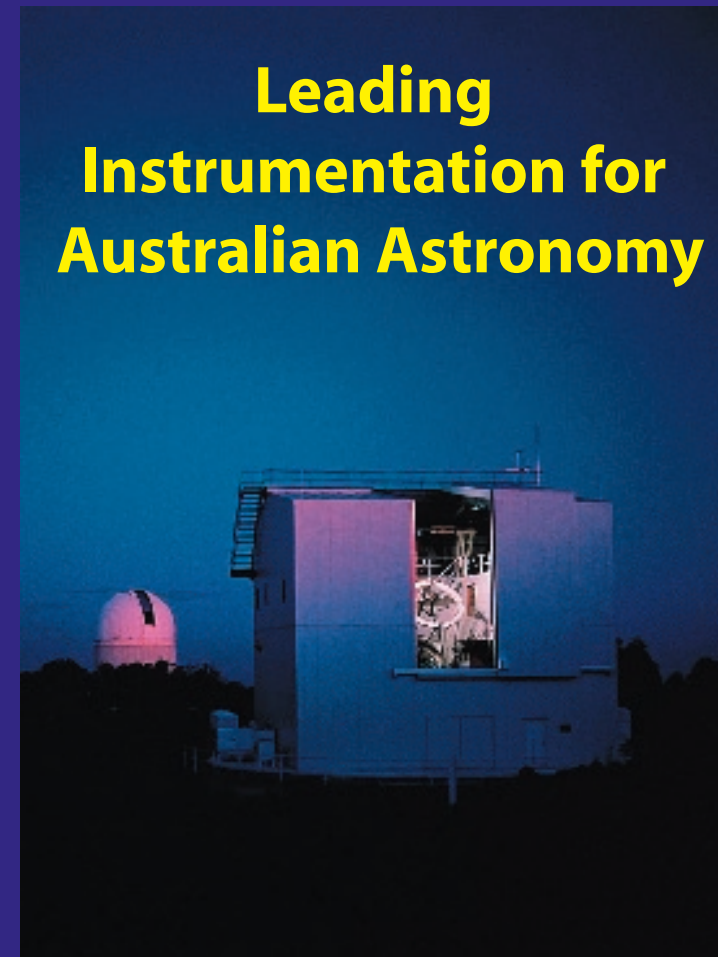
- Anglo-Australian Observatory
- Prime Optics
- Auspace Ltd
- LFM, University of Bremen
- GL Scientific

## Research School of Astronomy and Astrophysics



The Australian National University

## Leading Instrumentation for Australian Astronomy



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The ANU 2.3m telescope with tip-tilt image correction



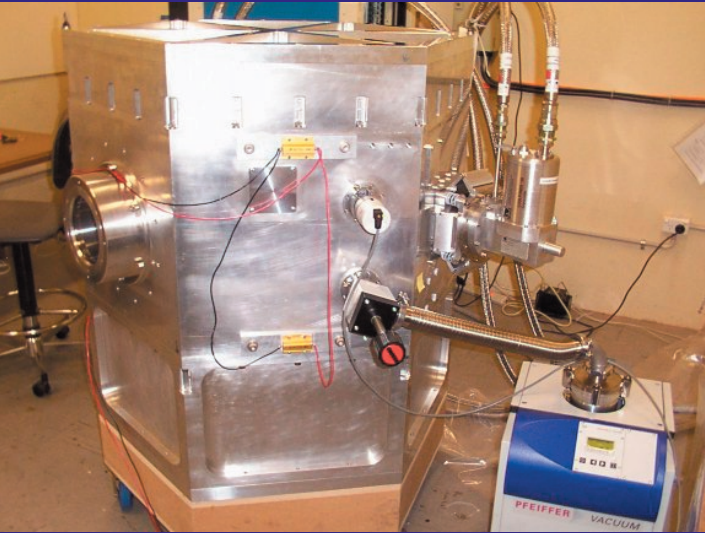
RSAA has extensive experience in the design, construction, and integration of astronomical instrumentation for its telescopes at Siding Spring Observatory and for Australia's largest astronomical optical/infrared telescopes, the Gemini 8m telescopes in Hawaii and Chile.

## Near-infrared Integral Field Spectrograph (NIFS)

- Australia's first instrument for the Gemini 8m telescopes
- Used with the ALTAIR adaptive optics system on Gemini North in Hawaii
- Performs near-infrared imaging spectroscopy at spatial resolutions similar to those obtained with the Hubble Space Telescope

### Key technologies

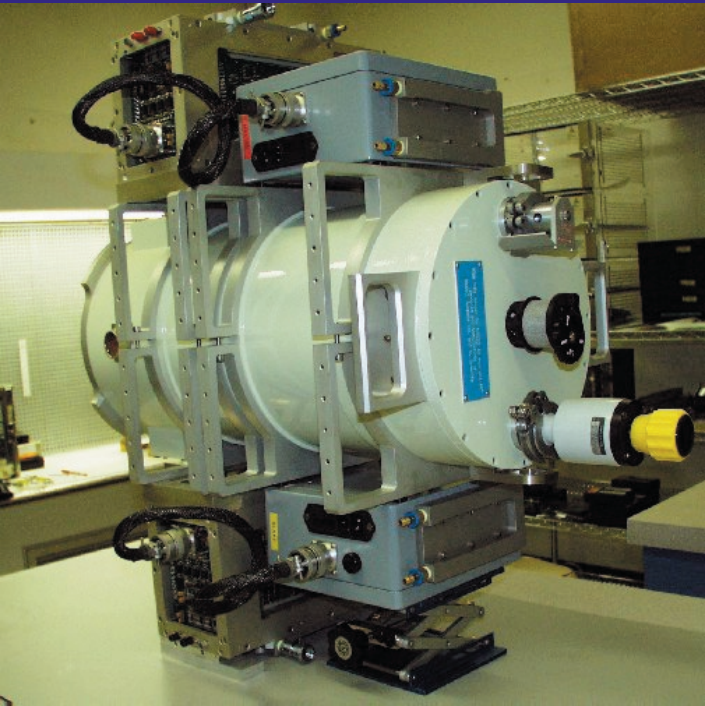
- Complex cryogenic optical system
- Monolithic single-point diamond-machined metal mirrors
- State-of-the-art 2048x2048 pixel near-infrared detector system



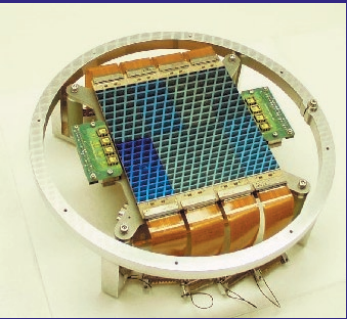
The NIFS cryostat

## Wide Field Imager (WFI)

- 8192x8192 pixel CCD mosaic camera
- One of the largest electronic cameras in existence
- Used on the ANU 40 inch telescope and the 4 m Anglo-Australian Telescope
- Built in collaboration with the Anglo-Australian Observatory, The University of Melbourne, and Auspace Ltd



The WFI dewar and instrument package



The WFI CCD mosaic

## Antarctic G-Mount/ADIMM

- An automated telescope and mount that operates in the extreme cold of the Antarctic
- Built for both site testing and science observation
- The ADIMM uses bright stars to measure image quality



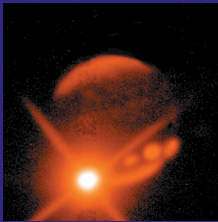
The G-Mount/ADIMM deployed at the South Pole

## Cryogenic Array Spectrograph/Imager (CASPIR)

- A fully cryogenic near-infrared instrument
- Used at the Cassegrain focus of the ANU 2.3 m telescope
- Wavelength range of 1 – 5 microns

### Key technologies

- CaF<sub>2</sub>, MgO, and sapphire optics



CASPIR observation of the comet SL9 impact on Jupiter