

# Anglo-Australian Observatory

## Annual Report

of the Anglo-Australian Telescope Board

1 July 1998 to 30 June 1999

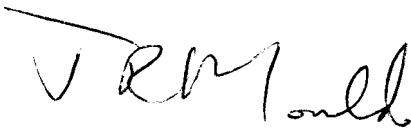




The Right Honourable Margaret Beckett, MP,  
President of the Board of Trade and Secretary of State for Trade and  
Industry, Government of the United Kingdom of Great Britain and  
Northern Ireland

The Honourable Dr David Kemp, MP,  
Minister for Education, Training and Youth Affairs  
Government of the Commonwealth of Australia

In accordance with Article 8 of the Agreement between the Australian Government and the Government of the United Kingdom to provide for the establishment and operation of an optical telescope at Siding Spring Mountain in the state of New South Wales, I present herewith a report by the Anglo-Australian Telescope Board for the year from 1 July 1998 to 30 June 1999. The report summarises the operations of the Board for the period under review and includes financial statements and statements of estimated expenditure in accordance with the provisions of the Agreement.

A handwritten signature in black ink, appearing to read 'J R Mould', with a long horizontal stroke extending to the left from the top of the first letter.

J R Mould  
Chair  
Anglo-Australian Telescope Board  
November 1999

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# Anglo-Australian Telescope Board

## United Kingdom



Chair  
Prof. R L Davies  
Professor of  
Astronomy,  
University of  
Durham



Prof. J A Peacock  
Professor of  
Cosmology,  
University of  
Edinburgh



Dr I F Corbett  
Director Science  
and Deputy Chief  
Executive, Particle  
Physics and  
Astronomy  
Research Council

## Australia



Deputy Chair  
Prof. J R Mould  
Director, Mount  
Stromlo and Siding  
Spring Observatories



Prof. R D Ekers  
Director, Australia  
Telescope National  
Facility



Prof. V R Sara  
Chair, Australian  
Research Council

## Anglo-Australian Observatory



Prof. B J Boyle  
Director, AAO

## Scientific highlights

### Weather outside our solar system

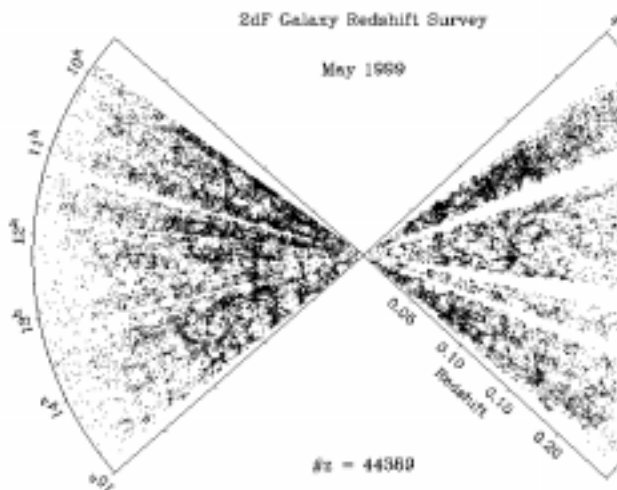
The AAT has been used to discover the first example of weather systems outside our solar system, on a special type of 'failed' star known as a brown dwarf. Although brown dwarfs form in the same way as stars, they share many of the same properties as planets. In particular, they rotate very rapidly, and solids and liquids condense out in their atmospheres. Astronomers, therefore, predicted that they should show weather patterns — just like planets — and obtained the first observations to show that they do.

### Quasar Nebula

The Taurus Tunable Filter was used in a variety of innovative science programs throughout the year. One of the most spectacular results was the discovery of an extended cloud of hydrogen gas, 600 000 light years across, surrounding a quasar. This is the largest gaseous nebula seen around a quasar, and provides further information on the interaction between these enigmatic objects and their immediate environment.

### Galaxy Redshift Survey

In early 1999, the AAT 2dF redshift survey (GRS) surpassed the Las Campanas redshift survey (26 000 redshifts) as the largest galaxy redshift survey yet compiled. At the end of June 1999, the number of redshifts obtained for the survey stood at over 40 000, well on the way towards the ultimate target of 250 000 redshifts which it is planned to reach in 2000–01. At the same time, the companion quasar redshift survey had measured over 4000 redshifts — 10 times bigger than the previous largest quasar redshift survey to similar depths. When complete, both surveys will provide unprecedented three-dimensional views of our Universe.



This 'cone' diagram shows the progress with the Galaxy Redshift Survey. Each 'ray' represents the galaxies seen along one particular line of sight (i.e. within a single 2dF field). The Milky Way Galaxy is at the centre; radial distance on the plot corresponds to the redshift, which is proportional to the true distance to each galaxy. This diagram is thus a map of all the galaxies observable with 2dF in one slice of the Universe.

## Other highlights

### Comet Lee

On the night of April 16 1999, AAT night assistant and amateur astronomer Steven Lee discovered a new comet in the southern constellation of Musca. He was attending a star party in Mudgee to give a talk on recent news from the AAO and serendipitously found the comet while searching for a planetary nebula. As the comet's orbit placed it 'behind' the Sun (as seen from the Earth) when it passed perihelion on July 11 1999, the comet did not become bright enough to be seen with the naked eye. Steven thus became one of the inaugural Edgar Wilson Award recipients for amateur discoveries of comets.

### LDSS++ commissioned

A highly innovative upgrade to one of AAO's instruments was successfully commissioned in October 1998. The enhanced Low Dispersion Survey Spectrograph (LDSS++) was used to carry out observations of faint galaxies in the Hubble Deep Field South, resulting in the spectroscopic identification of the faintest-ever source on the AAT. The upgrade to LDSS has seen a significant resurgence of interest in the use of this instrument.

### 25 years young

On the 27th April, 1974, the Anglo-Australian Telescope saw first light. A photographic plate was taken to check the polar alignment. This was the culmination of more than fifteen years of international negotiation and ten years of toil and innovation, solving the technical and engineering problems of a new telescope. The result was an instrument that is still recognised for its exceptional optics, the precision of its mounting and the power and flexibility of its computer control system.



The first log book entry for the AAT on 27/28 April 1974 compared to the computerised entry for 27/28 April 1999, 25 years later.

