

Anglo-Australian Observatory

Annual Report

of the Anglo-Australian Telescope Board

1 July 1999 to 30 June 2000



ANGLO-AUSTRALIAN OBSERVATORY
PO Box 296, Epping, NSW 1710, Australia
167 Vimiera Road, Eastwood, NSW 2122, Australia
PH (02) 9372 4800 (international) + 61 2 9372 4800
FAX (02) 9372 4880 (international) + 61 2 9372 4880
e-mail director@aaoepp.aao.gov.au

ANGLO-AUSTRALIAN TELESCOPE BOARD

PO Box 296, Epping, NSW 1710, Australia
167 Vimiera Road, Eastwood, NSW 2122, Australia
PH (02) 9372 4813 (international) + 61 2 9372 4813
FAX (02) 9372 4880 (international) + 61 2 9372 4880
e-mail ljw@aaoepp.aao.gov.au

ANGLO-AUSTRALIAN TELESCOPE/UK SCHMIDT TELESCOPE

Private Bag, Coonabarabran, NSW 2357, Australia
PH (02) 6842 6291 (international) + 61 2 6842 6291
AAT FAX (02) 6884 2298 (international) + 61 2 6884 298
UKST FAX (02) 6842 2288 (international) + 61 2 6842 2288
WWW <http://www.aao.gov.au/>

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COVER: A digital image of the Antennae galaxies (NGC4038-39) made by combining three images from the Tek2 CCD on the AAT (Steve Lee and David Malin). A new wide field CCD Imager (WFI) will come into use in 2000 and will enable many more images like this to be made.

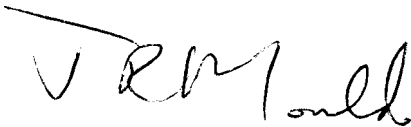
COVER DESIGN: Encore International

COMPUTER TYPESET AT THE: Anglo-Australian Observatory

The Right Honourable Stephen Byers, 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 1999 to 30 June 2000. 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 line extending from the top left of the signature.

J R Mould
Chair
Anglo-Australian Telescope Board
7 November 2000

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Anglo-Australian Telescope Board

Australia



Chair
Prof. J R Mould
Director, Research
School of
Astronomy and
Astrophysics,
Australian National
University



Prof. R D Ekers
Director, Australia
Telescope National
Facility



Prof. V R Sara
Chair, Australian
Research Council

United Kingdom



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



Prof. M J Barlow
Professor of
Astrophysics,
University College,
London



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

Anglo-Australian Observatory



Prof. B J Boyle
Director, AAO

Scientific highlights

2dF Redshift surveys

The large galaxy and quasar redshift surveys currently being carried out with the 2-degree field both passed major milestones during the past year. The galaxy survey passed the 100000th redshift mark while the quasar survey exceeded 10000 redshifts. This makes the surveys respectively 4 times and 10 times larger than the previous largest galaxy and quasar redshift surveys. Indeed, the 2dF quasar survey has now found more quasars in 18 months than in the previous 37 years since quasars were first discovered.

Star formation in the distant Universe

LDSS++ observations of distant galaxy clusters have shown that the formation of stars is strongly suppressed in the cluster environment. Star formation rates in galaxies belonging to the cluster AC114 at a distance of 3 billion light years from our own Milky Way galaxy, are over a factor of ten lower than field galaxies at similar distances. This result has significant implications for our understanding of galaxy formation and evolution.

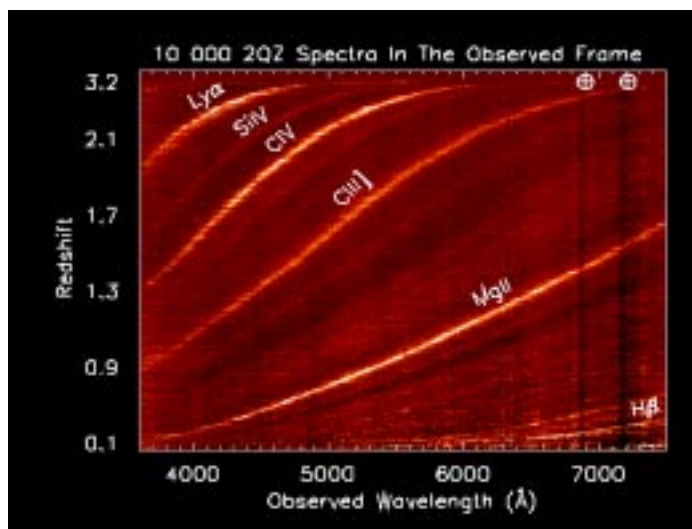


Image of 10000 QSO spectra observed to date in the 2dF redshift survey. The spectra are ordered according to increasing redshift and the effects of redshift on the bright QSO emission lines (labelled) can be clearly seen. (Courtesy: R.J.Smith and the 2QZ survey team)

Planet Search

The AAO Planet Search has successfully demonstrated its ability to measure velocities to a precision of 3 metres per second. It has now reached a stage where excellent planetary candidates are turning up; including a likely planet around a bright nearby star and possibly the first brown dwarf orbiting a star very much like our own sun.

Other highlights

A Fly-Through of the Universe

In collaboration with Swinburne University's Centre for Astrophysics and Supercomputing, the AAO released a visualisation of the 2dF Galaxy Redshift Survey: "A Flight Through the Universe". The visualisation takes the viewer on a cosmic trip through the redshift survey regions, providing a unique 3-dimensional view of the large-scale structure of the Universe as revealed by the 100000 galaxies observed to date in the 2dF galaxy redshift survey. An updated version with full commentary will soon be released to public observatories, planetaria and other organisations dedicated to scientific outreach. The visualisation is available for download from the AAO's WWW site, and from www.swin.edu.au/astronomy.



A still from *A flight through the Universe*, the movie of the 2dF galaxy redshift survey made in collaboration with Swinburne University's Department of Astrophysics and Supercomputing and the 2dF galaxy redshift survey team

AAO Instrumentation

During the year, the AAO successfully commissioned a large number of new facilities at the AAT. These include the SPIRAL integral field unit, the prime focus unit, the MAPPIT2 interferometer, oil cooling and a new CCD camera for the acquisition and guidance unit. In addition, the AAO successfully concluded a number of design studies for external clients including the OSIRIS spectrograph (Grantecan), Echidna positioner (Subaru), an integral field unit prototype (SOAR) and infrared multi-object spectrograph (Gemini).

25th Anniversary Celebrations

In October 1999, the AAO hosted a special weekend at Coonabarabran for members of the original AAT project team and those involved in the AAO throughout its illustrious 25-year history. The weekend was a tremendous success and all staff (past and present) found it a valuable opportunity to catch up with old friends and colleagues. Members of the original project team were delighted to discover that the telescope they put in so much hard work to create was still very much in the vanguard of world astronomy.