

Contact details

Address:

Astronomy Australia Limited
P.O. Box 2100
Hawthorn VIC 3122

Web:

www.astronomyaustralia.org.au

Telephone: +61 3 9214 5854

Fax: +61 3 9214 4396

ACN: 124 973 584

ABN: 19 124 973 584



Vision

To provide an efficient structure to facilitate Australian investment in astronomical facilities and to be recognised by stakeholders of Australian astronomy as the organisation to co-ordinate matters of national astronomy infrastructure

Image – Front cover

The **galaxy J003405-663934** looks fairly innocuous at infrared wavelengths (see inset) but is one of the largest radio galaxies known, with radio lobes that span nearly **2 Mpc or 60 million light years**. The image shows part of a large mosaic taken with the IRIS2 infrared camera on the Anglo-Australian Telescope, while the contours show the radio emission detected by the Australia Telescope Compact Array from the ATLBS survey (Subrahmanyam et al. 2008, arXiv:0802.0053). By combining the radio and infrared data, astronomers suspect that the host galaxy resides in a filament or sheet of galaxies, with the lobes expanding into void regions on either side.

Image courtesy: H Johnston

Image – This page

Image Credit: Jon Lawrence, UNSW



Contents

A message from the Chairman	2
Financial summary	4
AAL operating expenses	4
Grants received	4
NCRIS and LIEF grants paid to projects	5
Grants re-allocated during 2007/08	5
Balance of grants held by AAL	5
Reserves	6
Organisational chart	7
Board of Directors	8
Meetings attendance	8
Committees Membership	9
Board Committees	9
Audit and risk management committee	9
Operations Committees	9
Astronomy Roadmap	9
Executive Remuneration	9
Project Committees	10
Australian Antarctic Astronomy Advisory Committee (AAAAAC)	10
Australian Giant Magellan Telescope Advisory Committee (AGMTAC)	11
Australian NCRIS Strategic Options Committee (ANSOC)	11
Other Committees that AAL consults	12
Members and their representatives	14
Project Reports	15
An upgrade for the Anglo-Australian Telescope	16
A new addition to the Anglo-Australian Telescope Instrumentation Suite	16
A new era for Gemini in Australia	20
Australian Engagement with Extremely Large Telescopes	22
PILOT Design Study – The View from the Antarctic Plateau	24
ASKAP – Precursor to the World’s Largest Radio Telescope	26
Directors’ Report and Financial Statements	29-63
Appendix: Astronomy NCRIS Progress Report	65
Access and Pricing	67
Deviations from the Project Plan	67
Progress against Milestones	68
A. Governance	68
B. Research Infrastructure	70
C. Promotion	81
List of Astronomy NCRIS cash receipts and payments – grant allocations (GST exclusive)	83
List of Astronomy NCRIS cash receipts and payments – AAL operations (GST exclusive)	86
List of Astronomy NCRIS in-kind contributions (GST exclusive)	87
List of Astronomy NCRIS Reserve receipts and payments (GST exclusive)	88
ANU Statement confirming In-kind Contribution	89
ARC Statement confirming In-kind Contribution	90
UNSW Statement confirming In-kind Contribution	91
Acronyms used in this report	98

08 A message from the Chairman

Astronomy Australia Limited's second year has seen major progress in all of the NCRIS funded projects.

Highlights include:

- The signing of the Founders Agreement for the GMT
- The signing of the ASKAP sub-contract with CSIRO where AAL funds the digital system (the backbone of the array)
- The announcement of HERMES as the new instrument for the AAT.

In addition, and conscious of the need to increase Australian access to 8-m class telescopes to reach the equivalent of a 20% share, AAL has purchased additional nights on the Magellan telescopes in Chile. The Magellan contract (including Magellan Fellows) has now been extended for an additional 6 months to secure access until after the ANSOC recommendations are delivered.

To ensure the AAL Board receives appropriate advice on next generation optical facilities, two new committees were established during the year. The Australian Giant Magellan Telescope Advisory Committee (AGMTAC) provides advice on the GMT and other extremely large telescope developments, while the Australian Antarctic Astronomy Advisory Committee (AAAAC) advises on PILOT and other Antarctic Astronomy developments. The AAL Board has also established an Audit and Risk Management Committee (Chaired by Mr David Warren).

DIISR also called upon AAL to consider AAO operational funding for 2008-09 in the context of the reduction of UK funding. AAL was able to generate the necessary \$1.5M cash flow to bring forward some future AAO project payments, with the expectation that this money will be replenished through a future budget submission.



AAL has supported several community gatherings during the year: co-sponsoring a GMT Science meeting in Canberra attended by GMT Board directors, many members of the Australian astronomy community as well as Minister Carr, and co-sponsoring the SKA Pathfinders Science meeting in Perth which formed part of a comprehensive two-week technical program.

One of the priorities for AAL over the past year has been to establish a fair and transparent process for the allocation of the NCRIS Strategic Options fund. This has resulted in the formation of ANSOC, the Astronomy NCRIS Strategic Options Committee. This expert committee comprising three international astronomers and two AAL Board members (including Professor Michael Barber as Chair), will meet in September 2008 to consider submissions for GMT, PILOT and increased 8-m observing time, amid community consultation and guided by the Astronomy Decadal Plan. The AAT will also be considered in this context.

During 2008/09 AAL will submit an Astronomy Roadmap to DIISR. This roadmap will be informed by both the ANSOC process and new ownership, governance and operational models for the AAO currently being developed by DIISR. The roadmap is being drafted by the AAL Roadmap Committee (Chaired by Professor Brian Schmidt).

Two new staff have been appointed during the year: Dr Lisa Germany and Kate Farmer are proving to be an invaluable resource. All AAL staff are located at Swinburne University's Centre for Astrophysics and Supercomputing. We remain extremely grateful to Swinburne and Professor Matthew Bailes for this accommodation.

I would like to express my appreciation to all members of the AAL Board, the Chief Operating Officer and the Company Secretary for their support during the past year.



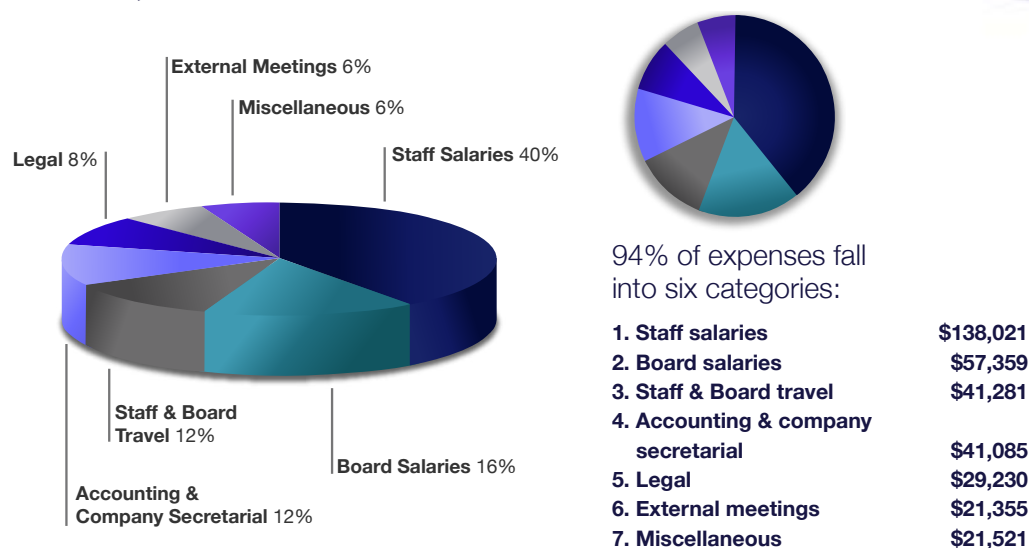
Dr Martin Cole

08 Financial summary

Note: All figures are GST exclusive

AAL operating expenses

AAL continued to perform its duties within budget. The Astronomy NCRIS funding agreement estimated expenses of \$397,140 for 2007/08, which was revised down to \$356,198 in the 2007/08 Astronomy NCRIS business plan. Actual expenses for the year were **\$349,852**.



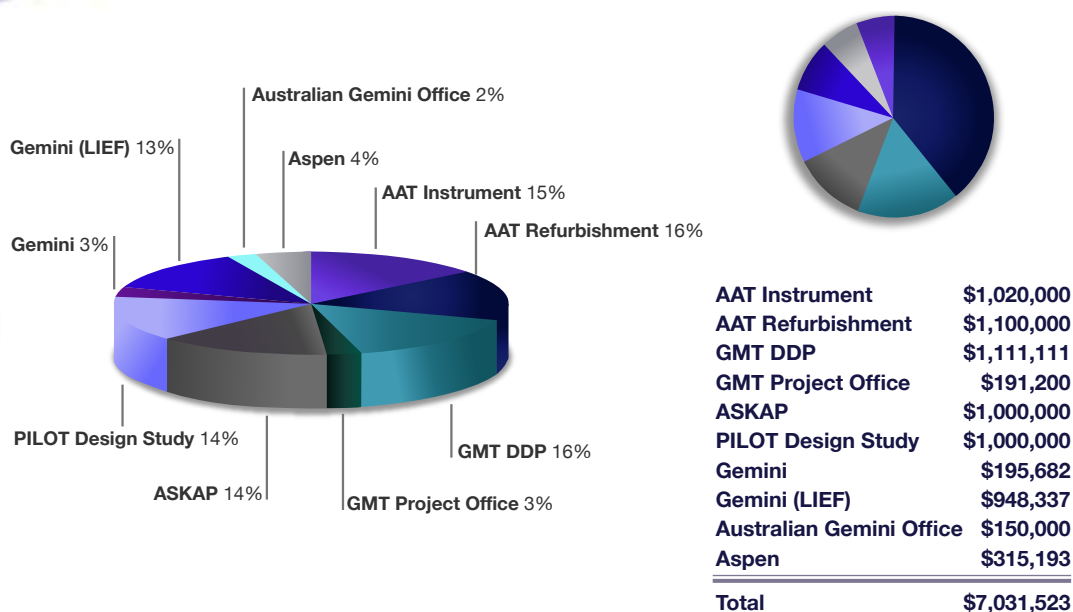
Grants received during 2007/08

AAL received three major grants during 2007/08:

The balance of the Gemini and SKA MNRF (from CSIRO):	\$1,235,294
Astronomy NCRIS (from DIISR):	\$6,805,000
Gemini LIEF (from ARC):	\$4,651,668

As per the Astronomy NCRIS funding agreement, the entire MNRF grant has been incorporated into the Astronomy NCRIS. As expected under the Astronomy NCRIS funding agreement, **\$948,337** of the LIEF grant was associated with Australia's **6.19%** share of the Gemini Observatory.

NCRIS and LIEF grants paid to projects during 2007/08



Grants re-allocated during 2007/08

\$64,000 of the Astronomy NCRIS was transferred from the GMT DDP to the Australian GMT Project Office during 2007/08. This transfer was possible due to gains recognised in the payment of the GMT DDP due to favourable exchange rates.

Balance of grants held by AAL

The NCRIS and LIEF grants are normally received by AAL around December or January each year. Therefore the balance of grants held by AAL on 30th June is used to fund projects for the subsequent six months until the yearly grant payments are received.

NCRIS grant held by AAL as of 30th June 2008

AAT instrument	\$850,000
AAT refurbishment	\$550,000
GMT DDP	\$75,689
Strategic Options	\$1,356,375
ASKAP	\$4,231,293
Gemini	\$1,401,010
Australian Gemini Office	\$150,000
Aspen	\$2,158,101
<hr/>	
Total	\$10,772,469

LIEF grant held by AAL as of 30th June 2008

Gemini:	\$3,703,331
----------------	--------------------

Reserves

AAL currently maintains two reserves:

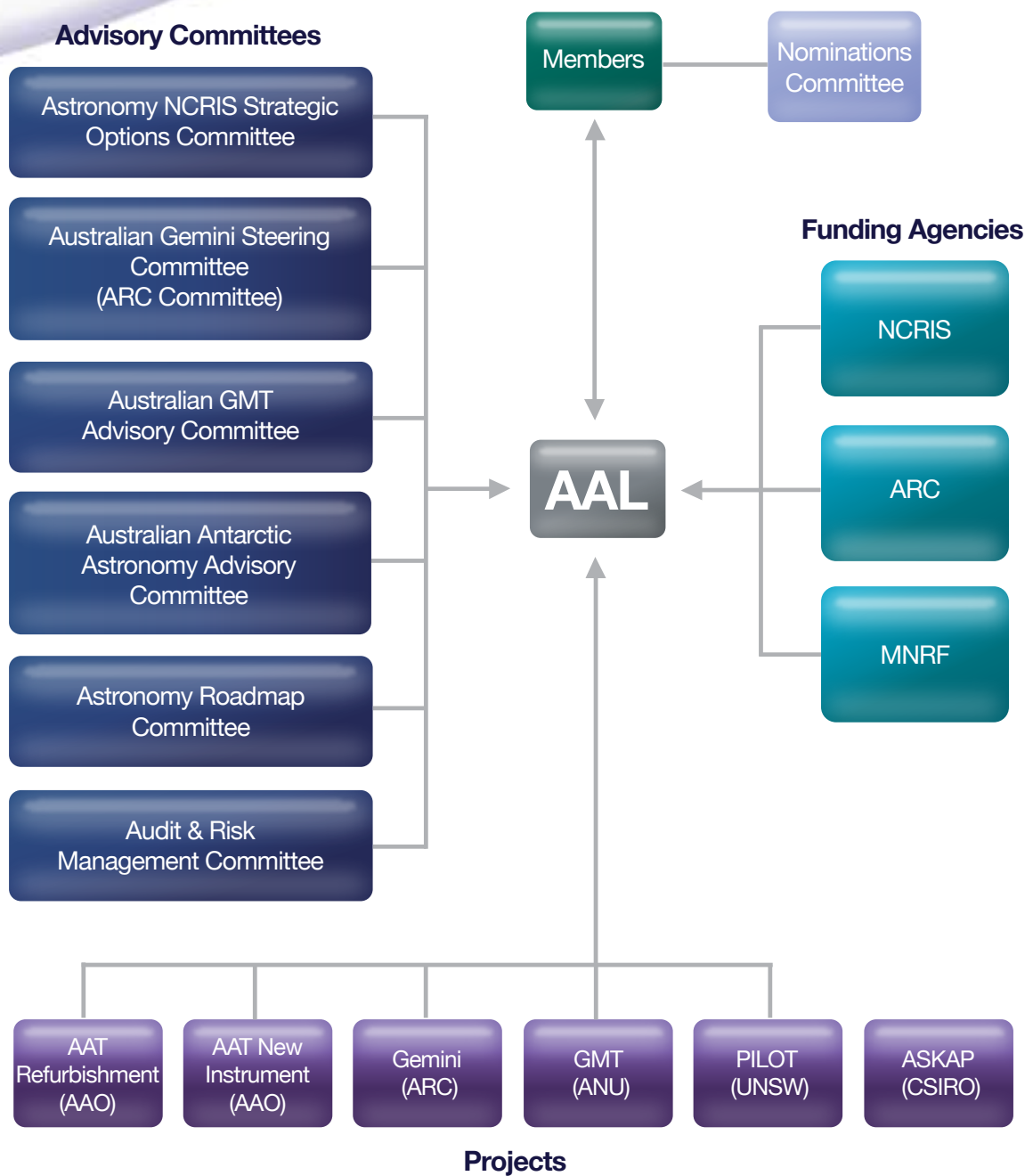
The Astronomy NCRIS reserve: \$809,635 (balance as of 30th June 2008)

The overseas optical reserve: \$3,638,739 (balance as of 30th June 2008)

The Astronomy NCRIS reserve results from interest earned from the NCRIS grant and must be used for projects covered by the Astronomy NCRIS funding agreement. During 2007/08 \$20,000 from this reserve was used to sponsor the SKA pathfinders science meeting in Perth and the GMT science meeting in Canberra.

The overseas optical reserve consists of money transferred from Sydney University as part of the transfer of the Gemini LIEF grant, and interest subsequently earned on those funds. During 2007/08 \$37,500 from this reserve was used to pay for the Australian Gemini Undergraduate Summer Scheme and travel for AGSC meetings.

Organisational chart as of 30th June 2008



08 Board of Directors

Dr Martin Cole (Chair)

Appointed 18 April 2007
till 30 September 2010

Prof Brian Schmidt

Appointed 18 April 2007
till 30 September 2008

Prof Michael Barber

Appointed 5 July 2007
till 30 September 2009

Prof Lister Staveley-Smith

Appointed 18 April 2007
till 30 September 2008

Prof Warrick Couch

Appointed 18 April 2007
till 30 September 2010

Mr David Warren

Appointed 5 July 2007
till 30 September 2010

Prof Elaine Sadler

Appointed 18 April 2007
till 30 September 2009

Meetings attendance

Director	Directors	Board	Operations	Project	Nominations	AGM
Cole	7/7	-	1/2	3/3	-	1/1
Barber	7/7	-	-	-	-	-
Couch	7/7	-	1/1	2/3	-	1/1
Sadler	7/7	-	1/1	-	-	1/1
Schmidt	7/7	-	1/1	-	-	1/1
Staveley-Smith	7/7	-	-	-	-	1/1
Warren	7/7	-	1/1	-	-	-

Notes:

Board Committees: The Audit and Risk Management Committee was formed during 2007/08 but not scheduled to meet until early 2008/09.

Nominations Committee: Due to the timing of AGMs, a Nominations Committee meeting was not required during 2007/08.

Committee membership as of 30 June 2008

Board Committees

Audit and Risk Management Committee

Chair

Mr David Warren

Members

Prof Lister Staveley-Smith

Dr Martin Cole

Operations Committees

Astronomy Roadmap

Chair

Prof Brian Schmidt

Members

Dr Martin Cole

Prof Elaine Sadler

Executive Remuneration

Chair

Dr Martin Cole

Members

Mr David Warren

Prof Warrick Couch



Project Committees

Australian Antarctic Astronomy Advisory Committee (AAAAC)

Chair

Mr Brett Biddington, CISCO Systems Inc

Members

Prof Tim Bedding, School of Physics, University of Sydney

Prof Brian Boyle, Director, Australia Telescope National Facility (ex-officio)

Prof Iver Cairns, Space Science Representative

Dr Martin Cole, Astronomy Australia Limited

Prof Matthew Colless, Director, Anglo-Australian Observatory (ex-officio)

Mr Roger Franzen, Research School of Astronomy and Astrophysics,
Australian National University

Prof Karl Glazebrook, Centre for Astrophysics and Supercomputing,
Swinburne University of Technology

Dr Charles Jenkins, Research School of Astronomy and Astrophysics,
Australian National University

Mr Ben Galbraith, Tasmanian Government Representative (ex-officio)

Mr Michael Stoddart, Australian Antarctic Division (ex-officio)

Prof John Storey, School of Physics, University of New South Wales
(ex-officio, non-voting)

A/Prof Mark Wardle, Macquarie University

Australian Giant Magellan Telescope Advisory Committee (AGMTAC)

Chair

Prof Karl Glazebrook, Centre for Astrophysics and Supercomputing,
Swinburne University of Technology

Members

Prof Warrick Couch, Astronomy Australia Limited

Dr Michael Brown, School of Physics, Monash University

Prof Harvey Butcher, Director, Research School of Astronomy and Astrophysics,
Australian National University (ex-officio)

Prof Matthew Colless, Director, Anglo-Australian Observatory (ex-officio)

Mr Roger Franzen, Research School of Astronomy and Astrophysics,
Australian National University

Mr Greg Harper, Government Liaison

Dr Charles Jenkins, Research School of Astronomy and Astrophysics,
Australian National University

Mr Jeff Ruckman, SKM, Industry Working Group Liaison

Prof Penny Sackett, Research School of Astronomy and Astrophysics,
Australian National University

Prof Chris Tinney, School of Physics, University of New South Wales

Australian NCRIS Strategic Options Committee (ANSOC)

Chair

Prof Michael Barber, Astronomy Australia Limited

Members

Prof Garth Illingworth, University of California Observatories/Lick Observatory

Prof Malcolm Longair, Cavendish Laboratory of the University of Cambridge

Mr David Warren, Astronomy Australia Limited

Dr Robert Williams, Space Telescope Science Institute



Other Committees that AAL consults

Anglo-Australian Telescope Board (AATB)

Chair

Prof Warrick Couch, Centre for Astrophysics and Supercomputing,
Swinburne University of Technology

Deputy Chair

Dr Stephen Warren, Reader, Department of Physics, Imperial College London

Members

Dr Ian Chessell, Director Chessell Research Pty Ltd, South Australia

Prof Sean Ryan, Head of School of Physics Astronomy and Mathematics
and Centre for Astrophysics Research, University of Hertfordshire

Prof Brian Schmidt, Research School of Astronomy and Astrophysics,
Australian National University

Dr Colin Vincent, Head Astronomy Division,
Science and Technology Facilities Council, UK



Australian Gemini Steering Committee (AGSC)

Chair and Australian Gemini Board Member

Prof Warrick Couch, Centre for Astrophysics and Supercomputing,
Swinburne University of Technology

Members

Dr Stuart Ryder, Australian Gemini Scientist, Anglo-Australian Observatory

Mr Len Marsden, Australian Research Council

Prof Gary Da Costa, Astronomical Society of Australia President's nominee,
Research School of Astronomy and Astrophysics, Australian National University

Prof Matthew Colless, National Committee for Astronomy (Chair),
Anglo-Australian Observatory

Prof Karl Glazebrook, Centre for Astrophysics and Supercomputing,
Swinburne University of Technology

Prof Michael Drinkwater, Department of Physics, University of Queensland

Prof Peter Quinn, School of Physics, University of Western Australia

Dr Scott Croom, School of Physics, University of Sydney

08 Members and their representatives

Members and their representatives as of 30th June 2008

Anglo-Australian Observatory	Prof Matthew Colless
Australian National University	Prof Harvey Butcher
Commonwealth Scientific and Industrial Research Organisation	Prof Brian Boyle
Curtin University of Technology	Prof Steven Tingay
James Cook University	Prof Norman Palmer
Macquarie University	A/Prof Mark Wardle
Monash University	Prof John Lattanzio
Swinburne University of Technology	Prof Matthew Bailes
University of Melbourne	Prof Rachel Webster
University of Queensland	Prof David Siddle
University of Sydney	Prof Dick Hunstead
University of Tasmania	Prof John Dickey
University of Western Australia	Prof Peter Quinn



Project Reports

Image Credit:
Giant Magellan Telescope -
Carnegie Observatories

An upgrade for the Anglo-Australian Telescope

After 35 years of active service, the infrastructure of the Anglo-Australian Telescope (AAT) is receiving a well-deserved refurbishment thanks to the Astronomy NCRIS. Work has begun to upgrade the Telescope Interlock Cubicle, a new fire alarm system has been implemented at the AAT, the UK Schmidt Telescope and the ANU Workshops, tons of redundant and obsolete cables and components have been removed, inspections of all cranes and pressure vessels have been carried out and new telescope axis and dome encoders have been ordered.

This major refurbishment of the AAT's infrastructure continues with different sub-projects over the life of the Astronomy NCRIS and will ensure that the telescope operates reliably, efficiently and safely for at least the next 10 years.

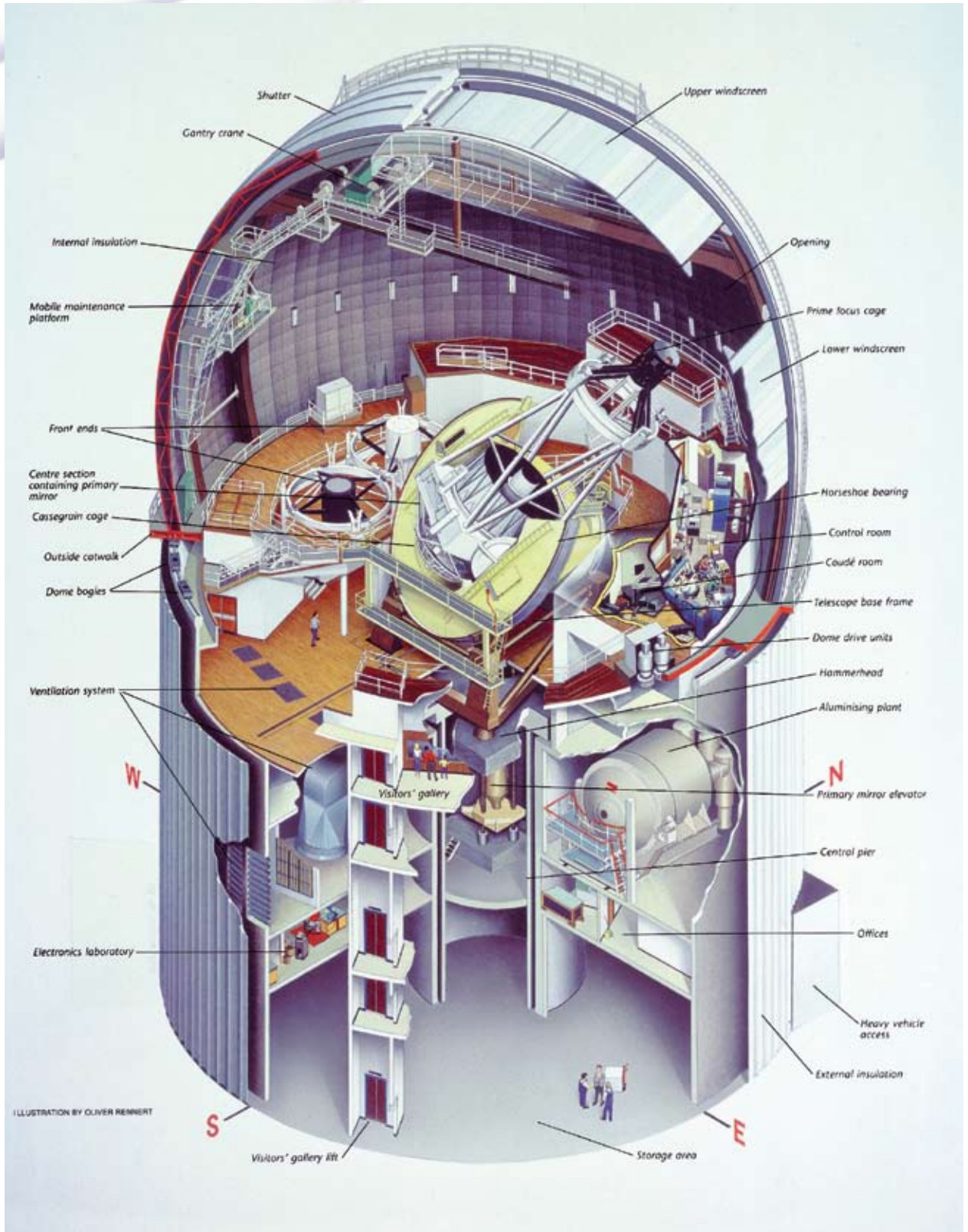
A new addition to the instrumentation suite

The AAO has also received Astronomy NCRIS funding to develop and build a new instrument to add to its already world-class instrumentation suite on the AAT. In order to provide users with the best possible new instrument, the AAO explored a wide range of instrument concepts and engaged in close consultation with the astronomy community. The aim of this process was to achieve several highly desirable goals for the instrument: it should deliver high-impact science; it should have unique capabilities that are not offered by other facilities; it should build on the AAT's particular strengths of wide field spectroscopy and conducting big surveys; and it should serve as broad a user base as possible.

Over 40 people from the astronomical community attended a workshop held 9 November 2007 where the four different instrument concepts were presented. After a wide-ranging discussion, the workshop concluded that HERMES (the High Resolution Multi-object Echelle Spectrograph) was the clear first choice based on the strength of its science case, the feasibility of the design, and the potential breadth of applications.

Anglo-Australian Telescope

The complex infrastructure of the AAT is undergoing a refurbishment through Astronomy NCRIS funding.

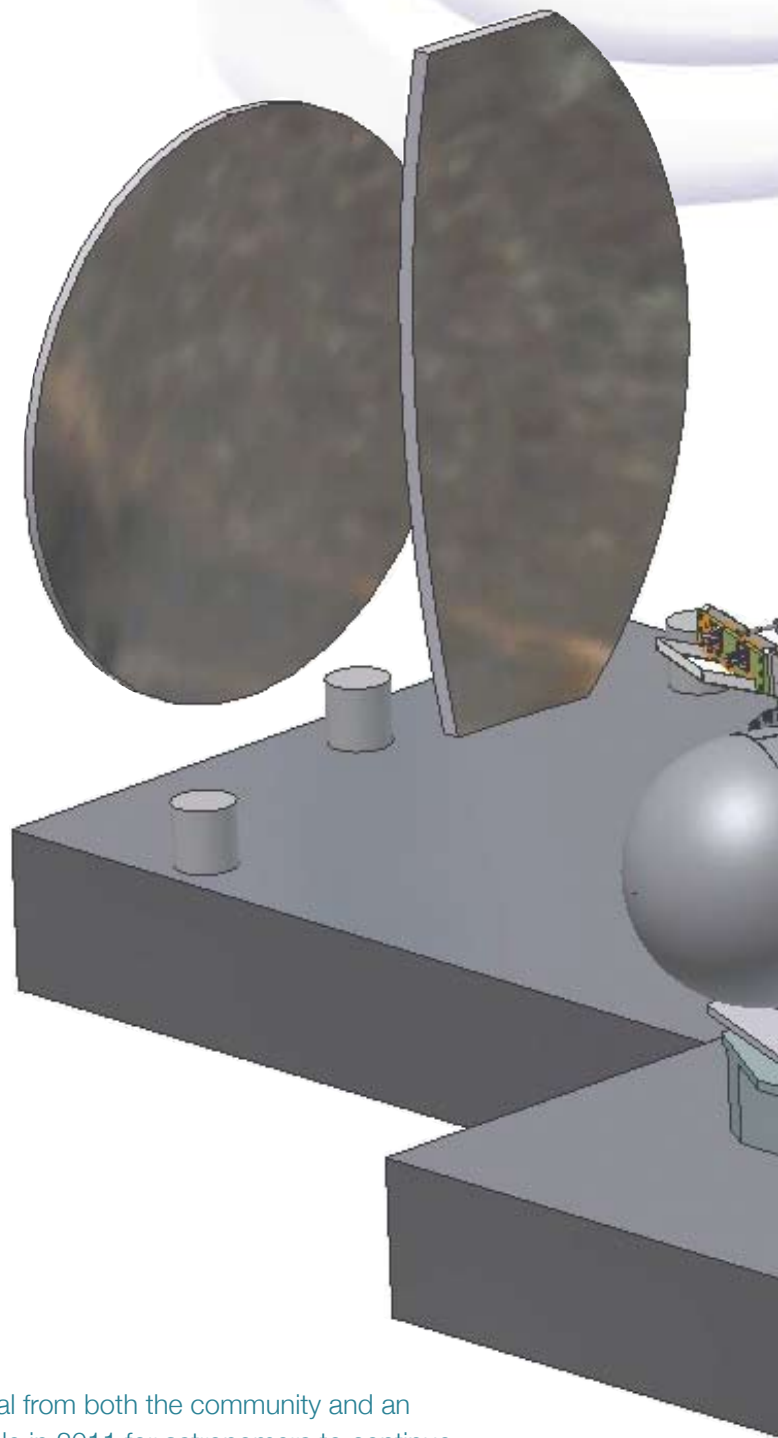


Technical challenge

To successfully piece together the formation history of our Galaxy, HERMES must meet three challenging requirements: it must be able to deliver high-resolution ($R \sim 30,000$), high-quality ($S/N=100$ in 60 minutes) spectra for each of the stars to allow precise abundances to be measured for many elements; it must be able to measure spectra for many (perhaps 540) stars at once to allow a huge sample to be studied in a reasonable amount of time; and it must be able to cover a large area of sky rapidly (2 degree field per pointing) so that the survey can map stars over the whole sky.

HERMES is able to deliver on all of these requirements by building upon the AAO's existing two-degree field system and optical fibre positioner (which allows spectra for up to 400 stars to be measured simultaneously), and by adding a very powerful new spectrograph that can handle all this information and make precise abundance measurements for many elements at once.

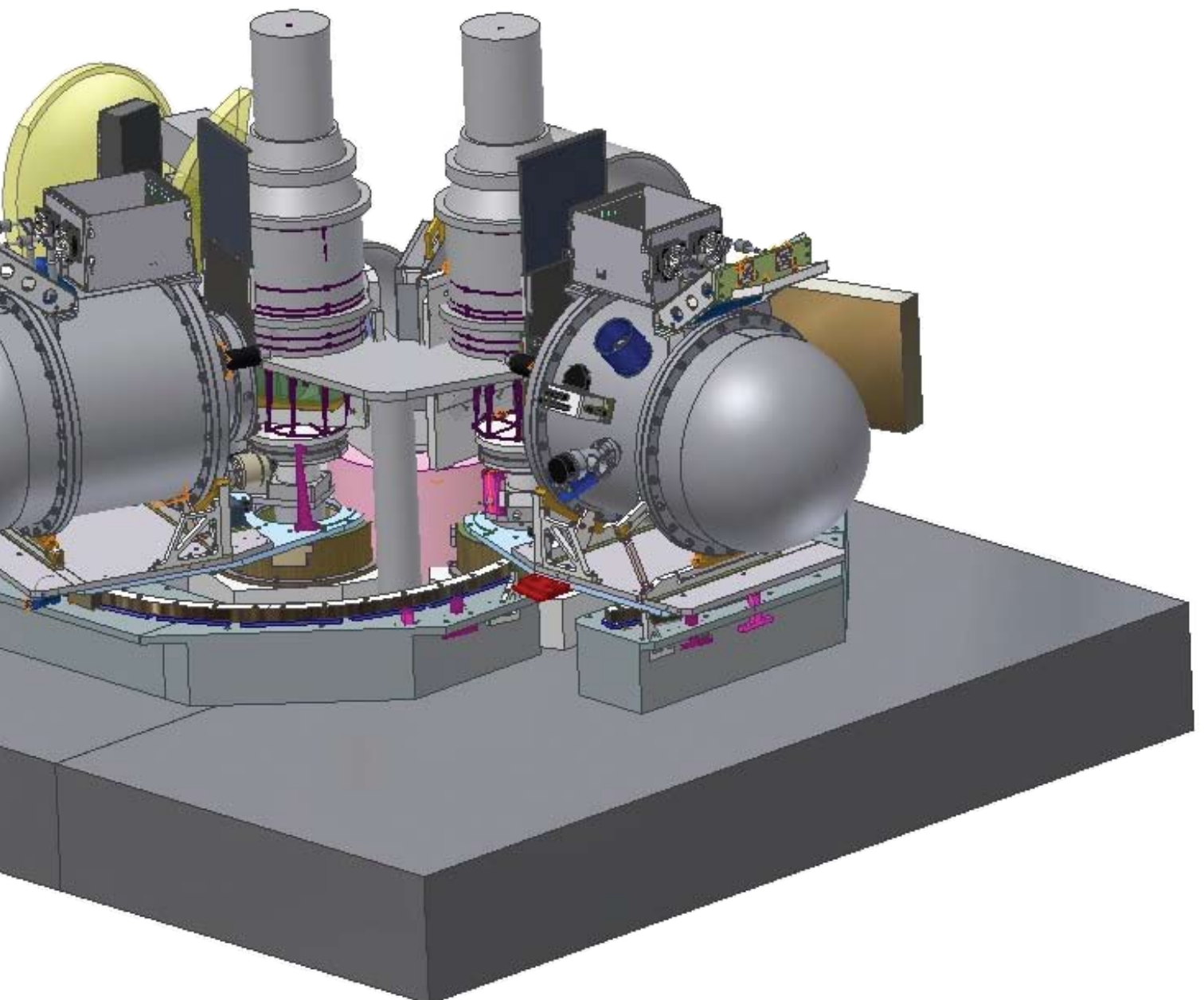
The HERMES concept design has gained approval from both the community and an independent panel. This instrument will be available in 2011 for astronomers to continue working on the sequence of events that produced our Milky Way.





Scientific highlight

Unravelling the complex formation history of our Galaxy is the primary science driver for HERMES. This process of “Galactic archaeology”, involves finding groups of stars that were born together in the same cloud of gas and dust through their chemical abundances - a common ‘fingerprint’ that uniquely identifies them. By measuring precise chemical abundances for a million stars it should be possible to identify the clouds from which our Galaxy formed. Combining this with estimates of the stars’ ages, and an analysis of their orbits around the Galaxy, will help to reveal a picture of the sequence of events that produced the Milky Way.



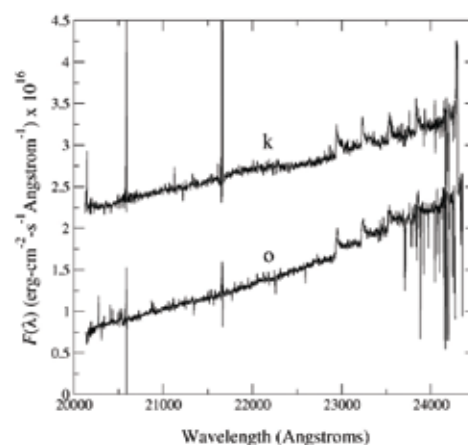
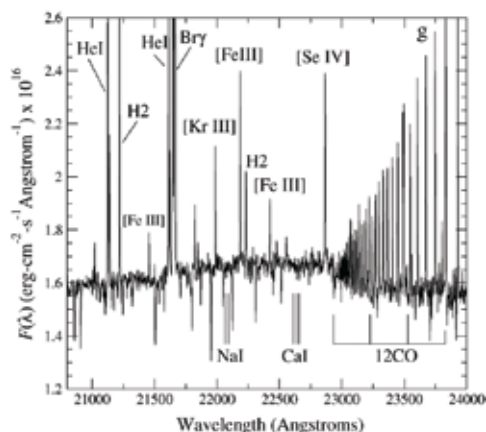
A new era for Gemini in Australia

Australia's 6.19% share of the two Gemini 8-m telescopes continues to be recognised as a critical component of Australia's national facilities, with an over-subscription rate (ratio of hours requested to hours available) of 230%. A total of 43 astronomers from 8 Australian institutions (8 of whom were PhD students) submitted 45 proposals for observing time with Gemini and, in the end, 35 astronomers from 6 institutions were allocated time on Gemini (or via the exchange program, time on the Subaru or Keck telescopes), 5 of whom were PhD students.

The Australian Gemini Office (AusGO) continues to manage the Australian time allocation processes for both the Gemini and Magellan telescopes, performs specified Gemini support duties, provides support for Gemini instruments as required and coordinates the selection of the three recipients of the Australian Gemini Undergraduate Summer Studentships. The office now resides at the AAO and consists of Dr Stuart Ryder, the Australian Gemini Scientist (AGS) and Dr Terry Bridges, Deputy Gemini Scientist (DGS). Dr Christopher Onken, the second DGS who will be based at the ANU's Research School of Astronomy and Astrophysics (RSAA), will start in September 2008.

Scientific highlight

Massive stars form in large star clusters that are obscured from view at optical wavelengths by natal dust clouds. Blum (NOAO) and McGregor (ANU) used NIFS spectra to understand the nature of the massive star cluster at the heart of the young embedded ultra-compact H II region, G45.45+0.06, and to identify the ionizing sources.



Near-infrared spectra obtained with NIFS of regions within the compact H II region G45.45+0.06. Objects "k" and "o" (above) are embedded young massive stars showing emission from dense CO molecules in their accretion disks. Region "g" (left) is a clump of gas that is ionized by the extremely hot central star, resulting in [Fe III], [Kr III], and [Se IV] emission. (Reference: Blum & McGregor 2008, AJ, 135, 1708)





Two of these young stars were classified from NIFS spectra as spectral type O3-4, among the hottest (and thus most massive) stars known. Other unresolved bright objects show red and/or nebular spectra, and one appears to have cool-star features that could be due to a young, low-mass, pre-main sequence component. Two others exhibit CO band-head emission that is interpreted as an accretion signature in massive young stellar objects. Notably, emission lines of Kr III and Se IV (i.e., highly ionized krypton and selenium) were detected. These lines have been seen previously only in higher excitation planetary nebulae.

Instrumentation

Australia continues to play a key role in the instrumentation associated with the Gemini telescopes with its second Gemini instrument, the Gemini South Adaptive Optics Imager (GSAOI) to undergo commissioning on the Gemini South telescope later in 2008. Both GSAOI and the Near-Infrared Integral Field Spectrograph (NIFS; Australia's first Gemini instrument) were designed and built by RSAA at the ANU.

The AAO is now leading one of the two Wide-Field Multi-Object Spectrograph (WFMOS) concept studies that are underway for the Gemini Aspen instrument program. Due to financial pressures and uncertainties within the major partner countries, the Gemini Board has decided not to proceed with the procurement of the Precision Radial Velocity Spectrograph. However, it remains committed to proceeding with the other two elements of the Aspen program: WFMOS and the development of a Ground Layer Adaptive Optics system for the Gemini North telescope. As such, new funding targets for the Aspen program stretching out to 2015 were set by the Board at its May 2008 meeting. These have been taken into account in determining the amount of funding available for the 'Strategic Options' (ANSOC) process.



AGUSS student Emily Craven getting ready for a night's observing with the Gemini South telescope. Image credit: Emily Craven.

Australian engagement with extremely large telescopes

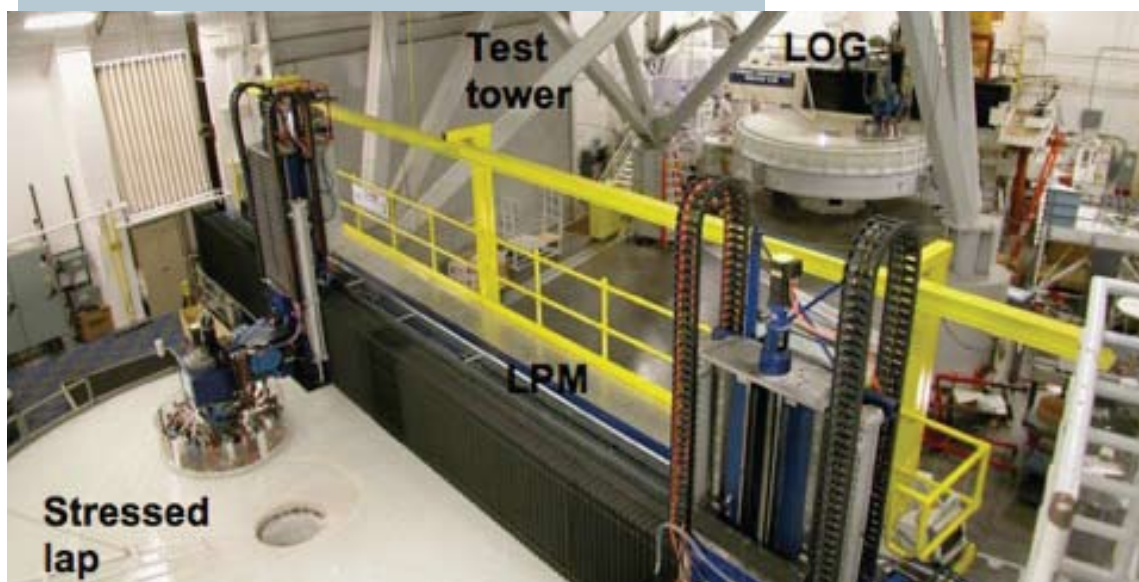
Australia's involvement with next-generation, extremely large telescopes has taken a step forward with AAL and ANU officially signing the Giant Magellan Telescope (GMT) Founders Agreement. Each organisation has the goal of funding 5% of the Design and Development Phase (DDP). Australia's membership of the GMT consortium also helps to position Australian industry to bid for GMT contracts, and enables Australian astronomers to contribute to science and instrumentation discussions.

To ensure Australian industry remains well informed of opportunities associated with the GMT, the Australian GMT Project Office (AGMTPO) has produced a brochure to be distributed at industry events, and established an online industry cluster database. To date, nine Australian manufacturing and technology institutions have registered their interest in

participating in the GMT project, with more expected after the GMT was highlighted at the 10th Australian Space Development Conference. ASDC is a biennial industry oriented conference well suited to informing companies suited to participating in the GMT project industry cluster.

Support for Australian involvement in the GMT was very much in evidence at the highly successful *Science with the Giant Magellan Telescope*. Astronomers as well as representatives from Australian industry attended the 3-day meeting held in Canberra at the end of March 2008. Representatives from all the international GMT partner institutions also attended the meeting, which boasted an impressive diversity of speakers in terms of scientific and technical expertise. As part of the workshop event, the new Australian Federal Minister for Innovation, Industry

First GMT mirror undergoing polishing at the University of Arizona Stewart Observatory Mirror Laboratory



and Science, the Honourable Senator Kim Carr, along with key personnel from his Department, was invited to Mt Stromlo to meet with international GMT Board members, astronomers and industry leaders.

The future of Australian national involvement with the GMT beyond the first year of the DDP will be one of the projects considered by the Astronomy NCRIS Strategic Options Committee.

Scientific highlight

The enormous collecting area of the GMT will open a new window on stellar astrophysics and chemical evolution within galaxies spanning a broad range of Hubble types and evolutionary histories. The large gain in angular resolution not only opens discovery space in the search for exoplanets, the study of black holes, dense star clusters, distant galaxies and a host of other interesting areas, but also affords strong synergy with facilities working at other wavelengths such as the Square Kilometre Array and the Atacama Large Millimetre Array. The GMT will also

offer strong complementarity with the forthcoming James Webb Space Telescope, a 6.5-m instrument planned for launch in 2013 into the Lagrange 2 position of the Earth Sun system.

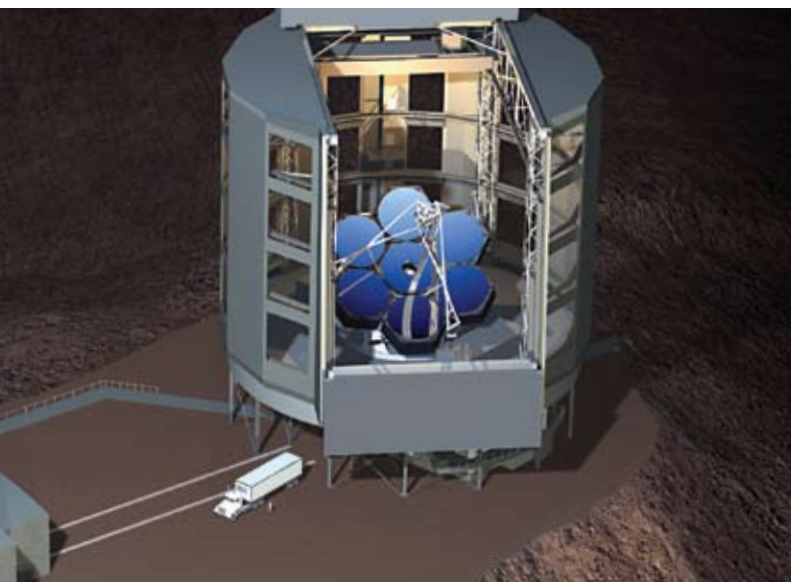
Technical challenge


The GMT mirrors are very complex and difficult to build as the six outer elements are all “off axis”, each forming one segment of a giant paraboloidal collecting surface. The casting of the first of these off-axis mirrors began even before the international GMT consortium completed the project Concept of Design Review in early 2006.

Today, work has progressed well into the polishing phase that must achieve a designed profile accurate to 20 nanometers over the entire 8.4-m diameter surface. It has been likened to levelling the whole of Brazil to within an accuracy of 1 cm. The polishing process is on track and once the first mirror has been completed, it is expected that the Arizona based mirror laboratory will be able to produce a new mirror every 10 to 12 months.

Careful atmospheric characterisation for Las Campanas Peak in Chile (the telescope site selected by the GMT consortium) has been conducted by an Australian led team. This modelling work is a crucial component in the development of the Adaptive Optical technologies required to phase the mirrors correctly and realise the full potential of the GMT.

The GMT will be sited at Las Campanas peak in Chile. Image Credit: Giant Magellan Telescope - Carnegie Observatories.





PILOT Design Study – The view from the Antarctic plateau

PILOT would be located at Concordia Station, Dome C. Image Credit: Eric Aristidi, University of Nice

The view from atop a 30 metre tower at Concordia Station, Dome C, in the Antarctic Plateau is taking shape with the conclusion of the PILOT design study. This study is the first step towards PILOT (the Pathfinder for an International Large Optical Telescope) becoming a reality, and identifies the costing for the construction and whole-of-life operation of the 2.4-m optical/infrared telescope, risks and risk mitigation strategies, potential construction contracts and a spend profile for the construction phase of PILOT.

In developing the design study, the PILOT team engaged in extensive consultation with the Australian astronomical community, in particular through the “PILOT Roadshow”. In this initiative, Michael Burton, Jon Lawrence, Will Saunders and John Storey undertook a tour of the major astronomical centres within Australia to present the technical and scientific overviews of the project. The idea was to spread awareness, initiate creative thought about the unique possibilities of PILOT, and also to receive feedback to ensure PILOT will meet the science requirements of the community.

This community engagement helped refine both the design of the telescope and the science case for PILOT. Four primary science goals have been prioritised in the design study, not only as a focus of interest within the astronomical community but also justified based specifically on the site characteristics at Dome C and the design of the telescope and instrumentation. These science goals are: to perform a weak lensing survey at optical wavelengths to measure the Equation of State of the Universe and its evolution, to search for pair-instability supernovae and gamma ray bursts in the early universe, to find a large sample of high redshift galaxies via a near infrared wide area survey, and to map the molecular hydrogen in the Milky Way at high angular resolution in the mid-infrared.

The future of Australian national involvement with PILOT beyond this design study will be one of the projects considered by the Astronomy NCRIS Strategic Options Committee.

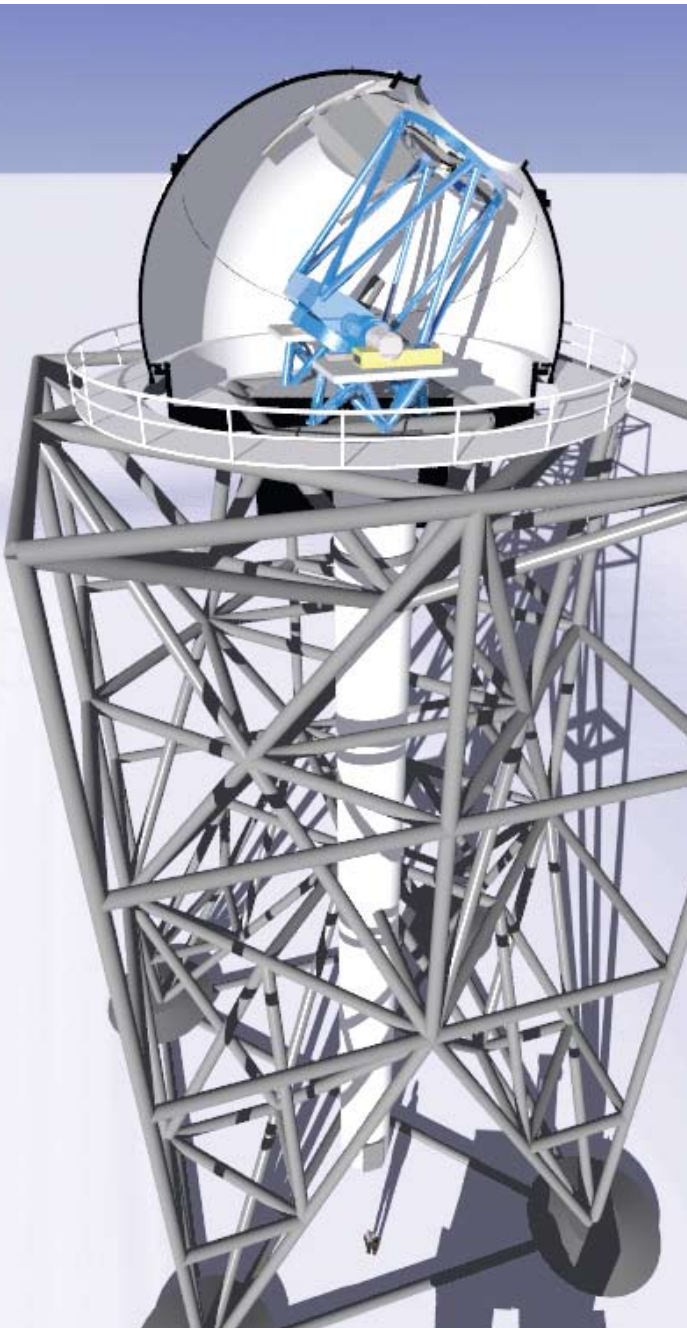
Scientific highlight

Weak gravitational lensing, which induces weak asymmetries in the observed ellipticities of distant galaxies, has been widely identified as the most promising route to measuring the evolution of the Equation of State of the Universe, and hence to understanding the nature of dark energy. The integration time required to measure the ellipticities of galaxies is a dramatic function of image quality, and with an expected resolution of ~ 0.3 arcsec at i band, PILOT will be at least an order of magnitude more efficient than a telescope of the same collecting and detector area at a temperate site.

Technical challenge

The most obvious challenge of building a telescope in Antarctica – the intense cold – is perhaps the most straightforward to deal with. More challenging is to overcome the degradation in the seeing caused by the steep vertical temperature gradient (up to 2°C per metre) close to the ground. To ensure PILOT achieves the best seeing conditions of any telescope on Earth, the telescope would sit atop a 30 metre tower inside a dome that is flushed with about four cubic metres per second of dry air. Computational fluid dynamic studies carried out as part of the PILOT design study, have revealed that excellent seeing results when this air is heated to precisely the same temperature as the air outside the dome aperture. These studies are also relevant to combating “dome seeing” for all other telescopes.

PILOT would sit atop a 30-m tower to overcome the degradation in seeing caused by the steep vertical temperature gradient close to the ground.



ASKAP – Precursor to the world's largest radio telescope

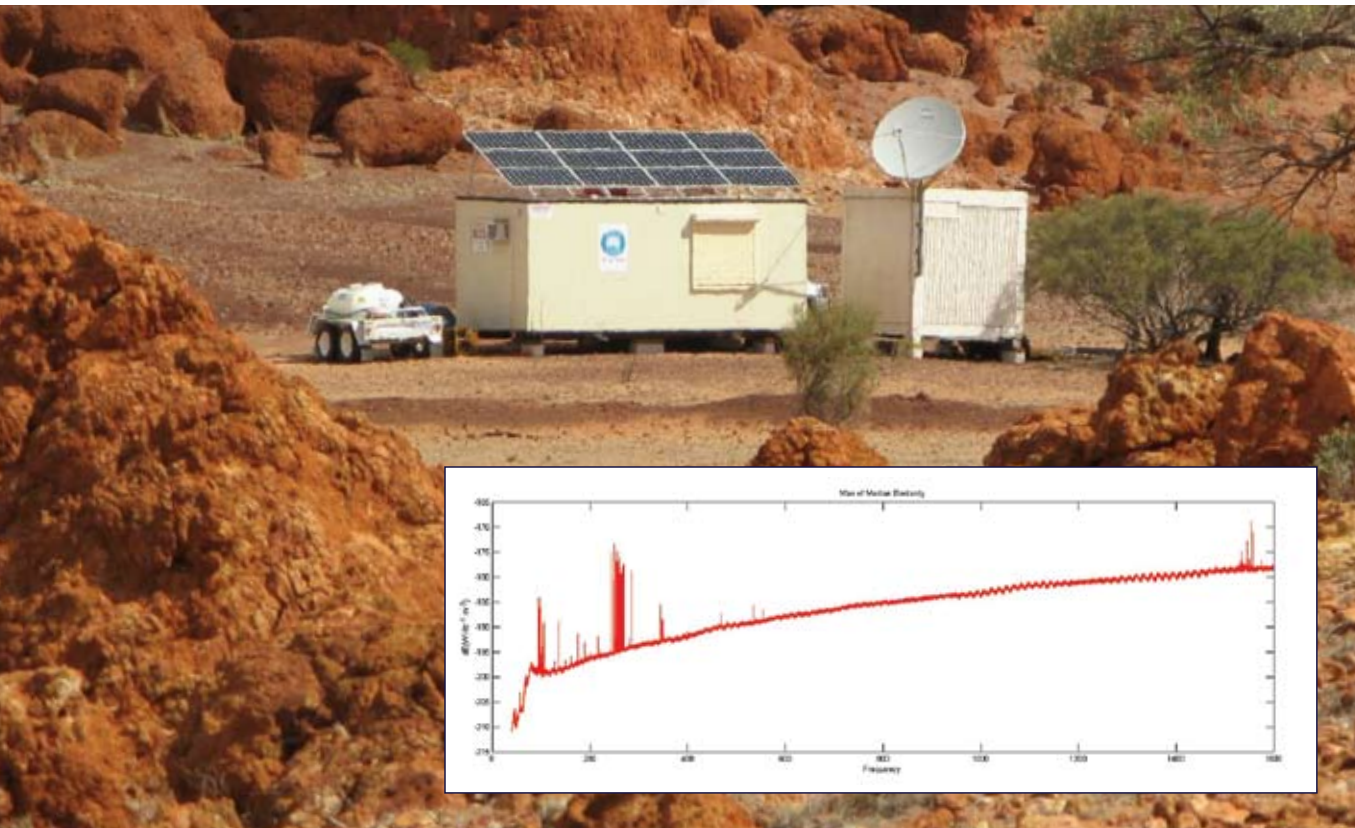
The Australian Government's decision to allocate additional funding into the Australian Square Kilometre Array Pathfinder (ASKAP) beyond what was allocated through NCRIS, highlights the national importance placed on the Square Kilometre Array (SKA). ASKAP will be a new world-class radio telescope in its own right, but it is also an important technology test-bed for SKA technology and has carriage of Australia's technical input into the international SKA program. The additional funding for the ASKAP project will provide considerable benefit to Australian science and industry.

The Astronomy NCRIS now funds 15% of the entire ASKAP project. These funds have been allocated to the ASKAP digital system, which is comprised of the beamformers and the central correlator and is one of the primary enabling technologies for ASKAP. The phrase “substituting silicon for steel” highlights the importance of this technology in allowing ASKAP to be built at all.

ASKAP is currently in a research and development phase including prototype testing of the Phased Array Feed (PAF) at the Parkes Testbed Facility, a new 12-m antenna built at the Parkes Observatory. The PAF is a core new technology for ASKAP that utilises the beamformers developed in the digital system. The Boolardy Engineering Test Array (BETA) is the next system to be built, and will be deployed at the Murchison Radio Observatory site in the Western Australian desert on the first six antennas of the array in 2009/10.



Members of the ASKAP team in front of the new 12-m Parkes Testbed Facility.



Initial deployment at the Murchison Radio Observatory. Inset shows a recent RFI scan of the area, showing the largely unpopulated spectrum.

Scientific highlight

ASKAP will be the fastest survey radio telescope in the world - able to detect hundreds of times more galaxies than previous radio telescopes to help us understand how galaxies have formed and evolved. It will help us to understand how our own Galaxy has developed and its current structure, and it will also be a world leader in studies of pulsars, transient radio sources, and magnetic fields in space, casting light on fundamental physics and processes at work in the universe today.

Technical challenge

The challenge for ASKAP is to demonstrate the technology and algorithms for high-dynamic, wide-field-of-view imaging. The use of sensitive “phased array feeds” enable the fast survey capability required for the science outcomes, yet present a formidable construction and calibration challenge. To provide the best opportunity for success, the ASKAP antennas employ a third-axis “sky mount” antenna and a long-focal-length primary optical configuration. The ASKAP site at the Murchison Radio Observatory in Western Australia, one of the best places in the world for metre- and centimetre-wave radio astronomy, is a key element in achieving the ambitious science outcomes.





Directors' report and financial statements

Image Credit: Interactive exploration of the ASKAP site.
WASP, University of Western Australia



Directors' Report

Astronomy Australia Limited

A.B.N 19 124 973 584

Your directors present their report on the company for the financial year ended 30 June 2008. Astronomy Australia is a company limited by guarantee.

The names of the directors in office at any time during, or since the end of, the year are:

Dr. Martin T. Cole
Prof. Warrick J. Couch
Prof. Elaine M. Sadler
Prof. Brian P. Schmidt
Prof. Lister Staveley-Smith
Prof. Michael N. Barber appointed 5th July 2007
Mr David M. Warren appointed 5th July 2007

Directors have been in office since the date of incorporation, being 18th April 2007, to the date of this report unless otherwise stated.

The surplus of the company for the financial year after providing for income tax of \$Nil, amounted to \$4,495,764 (2007 - \$25,129).

Review of Operations

During the year the company consolidated its operations by employing a Communications Officer and an Office Manager to facilitate the extensive work requirements of the Chief Operating Officer and the Directors.

No significant change in the nature of these activities occurred during the year.

The principal activities of the company during the financial year were liaison with the Australian astronomical community and ensuring investment in Australian astronomy infrastructure results in valuable national scientific infrastructure for the benefit of the entire Australian astronomical community.

To these ends the company has entered into an agreement with the Commonwealth of Australia, Department of Innovation, Industry, Science and Research (DIISR), for the receipt of funds over five years to enable the implementation of an investment plan for the National Collaborative Research Infrastructure Strategy Capability, known as Radio and Optical Astronomy.

Other likely developments in the operations of the entity and the expected results of those operations in future financial years have not been included in this report as the inclusion of such information is likely to result in unreasonable prejudice to the entity.

Directors' Report

No matters or circumstances have arisen since the end of the financial year which significantly affected or may significantly affect the operations of the company, the result of those operations, or the state of affairs of the company in future financial years.

The company's operations are not regulated by any significant environmental regulation under a law of the Commonwealth or of a State or Territory.

No dividends were paid during the year and no recommendation is made as to the dividends as the constitution of the company does not permit the payment of dividends.

No options over issued shares or interests in the company were granted during or since the end of the financial year and there were no options outstanding at the date of this report.

The company has paid directors' and officers' liability insurance with a policy under which all directors and officers of Astronomy Australia Ltd. are both indemnified and insured.

Company Secretary

The following person held the position of company secretary at the end of the financial year:

Mr. Robert W. Osborne, Chartered Accountant

Mr. Osborne is the principal of the firm R.W. Osborne & Associates and has held a Certificate of Public Practice since 1980. He is a Fellow of the Institute of Chartered Accountants in Australia and a Fellow of CPA Australia. Mr. Osborne is contracted to Astronomy Australia Ltd. and was appointed company secretary on 18th April, 2007.

Directors' Report

Information on Directors

Dr. Martin T. Cole
(Non Executive Chairman)

Qualifications:

Diploma of Electronics Engineering,
Master of Engineering,
Doctor of Philosophy (Fluid Dynamics)

Experience:

As a member of the Prime Minister's Science, Engineering & Innovation Council (1999-2007), he chaired the PMSEIC Work Group on Astronomy. Currently he is Managing Director of Cole Innovation & Design Pty. Ltd. and its subsidiary imRAC Pty. Ltd. In 1970 he founded IEI Pty. Ltd., an electronics research and manufacturing company which grew from a zero base to generate over \$200M total sales and over 2000 person-years of direct employment. He has invented and patented many electronic security devices and systems for crime prevention. He also pioneered the development and worldwide adoption of a revolutionary fire detection system, covered by several additional patents. This system protects over 50,000 zones including the NASA Space Shuttle launch pads. Recently he launched the next generation fire-prevention technology known as Monitair™ which won an EA National Engineering Excellence Award in 2005 and has been adopted worldwide by Siemens. National President of Engineers Australia (80,000 members) 2000 and 2001. On becoming an EA Fellow in 1982, he served the EA National Council for 21 years.

He designed the new corporate image for EA and held six successive portfolios as a National Vice (or Deputy) President. He initiated higher professional standards of membership, raised members' professional standing in the community, and introduced the "Council and Congress" model of governance and representation. He was also Chairman Victoria Division 1990, and was founding National President of the Society of Fire Safety 1994-99.

Interests:

Research (fluid dynamics, optical physics, electronics), cosmology (gravity & dark energy), graphic design, technical journalism, motor racing.

Family:

Christine with five children.

Special Responsibilities:

Chair – AAL Board of Directors

Chair – Executive Remuneration

Member – Audit & Risk Management Committee

Member – Astronomy Roadmap Committee

Member – Australian Antarctic Astronomy Advisory Committee

Member – ASKAP Science & Technology Advisory Group

Directors' Report

Information on Directors

Prof. Warrick J. Couch
(Non Executive Director)

Qualifications:

Bachelor of Science with Honours,
Master of Science,
Doctor of Philosophy (Astronomy)

Experience:

Optical Astronomy – Prof. Couch has a research career spanning 30 years in this area, with an extensive and distinguished track record in terms of:

- (i) Use of university, national and international telescope facilities (including the AAT, Gemini, VLT, HST),
- (ii) Research publications (career total of 160 refereed journal papers) and citation impact (Australian citation laureate and “Highly Cited” researcher), and
- (iii) Securing external research grant funding (career total of more than A\$3M).

Research collaboration at the national and international level – His research has involved numerous and often high profile national and international collaborations, the most notable examples being: the Berkeley-AAO Distant Supernovae Search, the MORPHS HST Distant Cluster Imaging Program (Aus, UK, US), the 2dF Galaxy Redshift Survey (Aust-UK), and the “WiggleZ” Dark Energy Survey (Aus, US, Canada).

National research policy and priorities –

He is or has been an active member of key national astronomy committees and bodies that are responsible for dealing with research policy and priorities, including the Australian Academy of Science’s National Committee for Astronomy (at the time when it had oversight of the last decadal planning process), the Anglo-Australian Telescope Board, the Australian Gemini Steering Committee, and the executive group responsible for writing the Australian “Radio and Optical Astronomy” NCRIS Investment Plan.

Strategy formulation and implementation

– He has gained considerable experience in this area through his involvement in the aforementioned national astronomy committees, particularly in developing short and long term strategies and priorities for our national astronomy infrastructure, and implementing related funding programs (e.g. MNRF and NCRIS).

Special Responsibilities:

Member – Executive Remuneration

Member – AGMTAC

Directors' Report

Information on Directors

Prof. Elaine M. Sadler
(Non Executive Director)

Qualifications:

Bachelor of Science with Honours,
Doctor of Philosophy (Astronomy)

Experience:

Radio Astronomy – Prof. Sadler has carried out many large research programs in radio astronomy, including the recently completed Sydney University Molonglo Sky Survey (SUMSS). Since 2001 she has been increasingly involved with science planning and technology development for the SKA and its pathfinder telescopes. Much of her current research uses the Australia Telescope facilities, and she currently chairs the ATNF Users Committee.

Optical Astronomy – She has spent six years as a staff astronomer and instrument scientist at the Anglo-Australian Observatory, and has also worked at major European (ESO) and US (Kitt Peak) observatories. Her current research programs use the AAT, Gemini and Magellan telescopes, and she is a member of the international Science Advisory Group for the AAO's 6dF Galaxy Survey.

Research collaboration at the national and international level – She served as President of Commission 28 (Galaxies) of the International Astronomical Union (IAU)

from 2003-06 and is now Vice-President of IAU Division VIII. The IAU is the world coordinating body for astronomy, and Commission Presidents are responsible for overseeing activities in their research area at an international level. She currently has active research collaborations with colleagues in Europe, India and the USA, and with researchers from several groups around Australia.

National research policy and priorities – She was involved in the Australian Astronomy decadal plan (2006-15), both at the Working Group stage and as a member of the Editorial Board which put together the final published document. She is currently a member of the National Committee for Astronomy. She has also been involved in discussion of national research issues as a member of AABoM, and as President of the Astronomical Society of Australia.

Special Responsibilities:

Chair – Nominations Committee

Member – Astronomy Roadmap Committee

Directors' Report

Information on Directors

Prof. Brian P. Schmidt
(Non Executive Director)

Qualifications:

Bachelor of Science, Physics and Astronomy,
A.M. in Astronomy,
Doctor of Philosophy (Astronomy)

Experience:

Optical astronomy – Prof. Schmidt is one of Australia's most active optical astronomers. His work has focused on the physics of supernovae and gamma ray bursts, and using these objects for cosmological studies. He is the instrument scientist for the new SkyMapper telescope which will undertake a comprehensive optical survey of the southern skies. Schmidt has received a variety of awards over his career, including the 2007 Gruber Prize for Cosmology, the 2006 Shaw Prize for Astronomy, and the inaugural Ministers Malcolm McIntosh award for Achievement in the Physical Sciences in 2000.

Radio Astronomy – Prof. Schmidt has undertaken research using radio facilities to understand supernovae and Gamma Ray Bursts. Prof. Schmidt is actively involved in the development Murchison Widefield Array, and has served as the Chair of the ATNF Time assignment committee.

Research collaboration at the national and international level – Schmidt was leader of the High-Z team, a group of 20 astronomers on 6 continents whose 1998 discovery of an

accelerating Universe was named Science Magazines Breakthrough of the Year. He has participated in several large international groups that have studied supernovae and gamma ray bursts, and is a member of the Australian and US National Academies of Science.

National research policy and priorities – Prof. Schmidt has been an active member of several national astronomy and science bodies that are responsible for prioritizing and allocated resources for research. These include having served on the Major National Research Facilities selection panel in 2000, served as a member of the Australian Square Kilometre Array Steering Committee, and chairing the Australian Decadal Working group on International Facilities.

Strategy formulation and implementation – Prof. Schmidt has taken a leading role in formulating strategy and implementation in Australian Astronomy. He is currently a member of the Anglo-Australian Telescope Board, and the Murchison Widefield Array Board. He chaired the Australian National Academies LOFAR options working group.

Special Responsibilities:

Chair – Astronomy Roadmap Committee

Directors' Report

Information on Directors

Prof. Lister Staveley-Smith
(Non Executive Director)

Qualifications:

Bachelor of Arts with Honours,
Doctor of Philosophy (Radio Astronomy)

Experience:

Astronomy Research – Prof. Staveley-Smith is an active researcher, with 293 publications, 104 of which have been in the last 5 years. He is a member of the Editorial Advisory Committee for PASA. Radio Astronomy – With a PhD in radio astronomy, he has worked for 16 years at ATNF, prior to becoming a Premier's Fellow in Radio Astronomy at UWA.

Research Collaboration – many of the projects that he has been involved in are collaborative in nature with national and international participation. A current example is his recent work on Gas Evolution which involves researchers from Australia, Germany, USA, Netherlands, and the UK.

National Research Policies – He is currently a member of the NCA and the Advisory Panel for the Australia-India Strategic Research Collaboration Fund. He was the immediate past Director of the

Gemini and SKA MNRF and was a member of the Australian Astronomy Board of Management.

Business Administration and Finance – He was Head of Astrophysics at ATNF for 6 years and Assistant Director Astrophysics for two years, responsible for annual theme funding of \$4M. He has participated in several project management, business management and leadership courses including that of the Australian Institute of Company Directors (AICD) in February 2005.

Strategy Foundation – He has been a member of various NCRIS and Decadal Plan working groups and is also Chair of the MWA Science Council.

Special Responsibilities:

Member – Audit & Risk Management Committee

Directors' Report

Information on Directors

Prof. Michael N. Barber
(Non Executive Director)

Qualifications:

Bachelor of Science with Honours,
Doctor of Philosophy (Theoretical Physics)

Experience:

Prof. Michael Barber brings to the Board extensive experience:

National research policy and priorities – He has served as Secretary, Science Policy of the Australian Academy of Science, been a member on the Australian Research Council and has lead CSIRO's engagement with the National Research Priorities.

Research collaboration at the national and international level – In addition to his ARC and CSIRO experience, he has worked closely with a number of overseas agencies including FRST in NZ and the Industry Canada in the development of policies and programs to enhance collaborative research. He also has strong personal networks that include senior people in agencies such as

the NSF, the National Research Council and the Carnegie Institution in the US and the European Union.

Strategy formulation and implementation – He has been a senior executive in two universities – UWA and ANU – and CSIRO in a number of roles that have all involved the development and implementation of strategy. He is currently Vice Chancellor and President of Flinders University.

Special Responsibilities:

Chair – Astronomy NCRIS Strategic Options Committee

Directors' Report

Information on Directors

Mr. David M. Warren
(Non Executive Director)

Qualifications:

Bachelor of Science with Honours

Experience:

Mr. Warren brings a combination of international business experience and knowledge of practical astronomy. He has been involved in corporate governance to public company standards and has considerable experience with corporate legal matters. He is well acquainted with matters of Business Administration and Finance. Of particular relevance is his membership of the Audit and Remuneration committees of Altium Ltd. Altium Ltd. is a Sydney based company which makes CAD software for electronic design.

Physics and astronomy led him into the world of electronics and software where technologies employed at the cutting edge of science were rolled out into the commercial world. This involvement with electronics and software spans a period from before the microprocessor until the present age of ubiquitous computing and global connectivity.

He has established a DSP group at the University of Tasmania and is involved in optical astronomy micro-lensing studies for the purpose of discovering new planets. He has acted as an observer for the PLANET consortium of which his local UTAS micro-lensing group is a member. He is actively involved in research collaboration at international level by establishing micro-lensing cooperation between members of PLANET and the Brazilian National Space Agency, INPE. He is also involved in managing the collaboration with PLANET.

Special Responsibilities:

Chair – Audit & Risk Management Committee

Member – Astronomy NCRIS Strategic Options Committee

Member – Executive Remuneration

Directors' Report

Register of Directors interests

Dr. Martin T. Cole

1. Fellow – Australian Academy of Technological Sciences & Engineering
2. Honorary Fellow and Past President – Engineers Australia

Prof. Brian P. Schmidt

1. Employed by the Australian National University, RSAA
2. Board Member – AAT
3. Board Member – MWA
4. Member – AURA-Gemini oversight committee
5. Member – Australian Academy of Sciences
6. ARC Grant holder

Prof. Lister Staveley-Smith

1. Employed by University of Western Australia
2. Chair – MWA Science Council (until June 2008)
3. Member – MWA monitor and control team at UWA
4. Member – ASKAP science working group
5. Member – ASKAP user policy group
6. Member – National Committee for Astronomy
7. Member – Australia-India Strategic Research Fund panel
8. Member – Astronomical Society of Australia council
9. Member – Institute of Physics
10. Member – International Astronomy Union
11. Member – Publications of the Astronomical Society of Australia editorial committee.
12. ARC Grant holder

Prof. Michael N. Barber

1. Vice Chancellor and President of Flinders University
2. Director – AARNet Pty Ltd
3. Member – Universities Australia
4. Fellow – Australian Academy of Science

Directors' Report

Register of Directors interests cont.

Mr. David M. Warren

1. Non Executive Director, Altium Ltd (www.altium.com.au)
Remuneration committee member, Altium Ltd
2. Non Executive Director, Houstons Farm Pty Ltd
Remuneration committee member, Houstons Farm Pty Ltd
3. Honorary Research Associate, School of Mathematics and Physics, UTAS
4. Associate Member, PLANET. (planet search by way of gravitational microlensing)
(<http://planet.iap.fr/>)
5. Considerable financial support for astronomy at UTAS and indirectly of PLANET.
6. Member of the Australian Institute of Physics
7. Member of the Australian Institute of Company Directors

Prof. Elaine M. Sadler

1. Employed by the University of Sydney
2. Vice-President – IAU Division VIII (Galaxies and the Universe)
3. Member – IUPAP Commission 19 (Astrophysics)
4. Member – SKA Science Working Group
5. Chair – Australia Telescope Users Committee
6. Member – National Committee for Astronomy
7. Member – ASKAP user policy group
8. ARC Grant holder

Prof. Warrick J. Couch

1. Employed by Swinburne University of Technology
2. President – Astronomical Society of Australia
3. Chair – Anglo-Australian Telescope Board
4. Chair – Australian Gemini Steering Committee
5. Member – International Gemini Board
6. Member – National Committee for Astronomy
7. Fellow – Astronomical Society of Australia
8. ARC Grant holder

Directors' report

Meetings of Directors

	Directors Meetings		Board Committee Meetings	
	No. Eligible to Attend	No. Attended	No. Eligible to Attend	No. Attended
Name:				
Dr. Martin T. Cole	7	7	-	-
Prof. Warrick J. Couch	7	7	-	-
Prof. Elaine M. Sadler	7	7	-	-
Prof. Brian P. Schmidt	7	7	-	-
Prof. Lister Staveley-Smith	7	7	-	-
Prof. Michael N. Barber	7	7	-	-
Mr. David M. Warren	7	7	-	-

Auditor's Independence Declaration

A copy of the auditor's independence declaration as required under section 307C of the Corporations Act 2001 is set out on page 43.

Signed in accordance with a resolution of the Board of Directors:

Director: 
Dr. Martin T. Cole

Director: 
Prof. Warrick J. Couch

Dated this 15th day of August 2008

Astronomy Australia Limited A.B.N 19 124 973 584

Auditor's Independence Declaration under section
307C of the Corporation Act 2001 to the directors of
Astronomy Australia Limited

Auditor's Independence Declaration

I hereby declare, that to the best of my knowledge and belief, during the financial year ended 30 June 2008 there have been no:

- (i) contraventions of the auditor independence requirements as set out in the Corporations Act 2001 in relation to the audit; and
- (ii) contraventions of any applicable code of professional conduct in relation to the audit.

Name of Firm: E. Townsend & Co.
Chartered Accountant

Name of Partner: 
Eric Townsend

Address: 35 Mereweather Avenue, Frankston. Vic. 3199.

Dated this 15th day of August 2008

Income statement for the year ended 30 June 2008

	Note	2008 \$	2007 \$
Revenues from ordinary activities	2	11,934,639	222,574
Grants paid		(7,089,023)	-
Auditor's remuneration	3	(2,100)	(2,000)
Bad and doubtful debt expenses		(5,000)	-
Depreciation and amortisation expenses		(1,139)	(90)
Employee benefits expenses		(175,904)	(68,635)
Other expenses		(165,709)	(126,720)
Surplus before income tax	4	4,495,764	25,129

The accompanying notes form part of these financial statements

Balance sheet as at 30 June 2008

	Note	2008 \$	2007 \$
CURRENT ASSETS			
Cash and cash equivalents	5	19,206,789	9,997,004
Trade and other receivables	6	-	6,134
TOTAL CURRENT ASSETS		19,206,789	10,003,138
NON-CURRENT ASSETS			
Property, plant and equipment	7	8,097	2,059
TOTAL NON-CURRENT ASSETS		8,097	2,059
TOTAL ASSETS		19,214,886	10,005,197
CURRENT LIABILITIES			
Trade and other payables	8	14,686,718	9,980,068
Provisions	9	7,275	-
TOTAL CURRENT LIABILITIES		14,693,993	9,980,068
TOTAL LIABILITIES		14,693,993	9,980,068
NET ASSETS		4,520,893	25,129
EQUITY			
Reserves		4,448,374	6,655
Retained earnings	10	72,519	18,474
TOTAL EQUITY		4,520,893	25,129

The accompanying notes form part of these financial statements

Statement of changes in equity for the year ended 30 June 2008

	Note	Retained Earnings \$	NCRIS Reserve Account \$	Overseas Optical Reserve Account \$	Total \$
Interest Received Transferred		(6,655)	6,655	-	-
Surplus attributable to equity shareholders		25,129	-	-	25,129
Balance at 30 June 2007		18,474	6,655	-	25,129
Surplus attributable to equity shareholders		4,495,764	-	-	4,495,764
Receipts Allocated to Reserves		(3,512,032)	-	3,512,032	-
Interest Received Less Bank Fees Allocated to Reserves		(987,187)	822,980	164,207	-
Payments allocated from Reserves		57,500	(20,000)	(37,500)	-
Balance at 30 June 2008		72,519	809,635	3,638,739	4,520,893

The accompanying notes form part of these financial statements

Cash flow statement for the year ended 30 June 2008

	2008 \$	2007 \$
Cash Flows from Operating Activities:		
Receipts from Grants/Members	17,998,239	10,191,907
Interest Received	997,038	3,570
Payments to Suppliers, Employees & Taxes	(1,980,390)	(196,324)
Payments of Grants	(7,797,925)	-
Net Cash Provided by (Used in) Operating Activities	9,216,962	9,999,153
Cash Flows from Investing Activities:		
Proceeds from Sale of Property, Plant & Equipment	-	-
Payment for Property, Plant & Equipment	(7,177)	(2,149)
Net Cash Provided (Used in) Investing Activities	(7,177)	(2,149)
Cash Flows from Financing Activities:		
Proceeds from Borrowings	-	-
Repayment of Borrowings	-	-
Distributions/Dividend by Chief Entities	-	-
Net Cash Provided (Used in) Financing Activities	-	-
Net Increase (Decrease) in Cash Held	9,209,785	9,997,004
Cash at Beginning of the financial year	9,997,004	-
Cash at 30th June 2008	19,206,789	9,997,004

The accompanying notes form part of these financial statements

Notes to the financial statements for the year ended 30 June 2008

1 Statement of Significant Accounting Policies

The financial report is a general purpose financial report that has been prepared in accordance with Accounting Standards, including Australian Accounting Interpretations, other authoritative pronouncements of the Australian Accounting Standards Board and the Corporations Act 2001.

The financial report covers Astronomy Australia Limited as an individual entity. Astronomy Australia Limited is a company limited by shares, incorporated and domiciled in Australia.

The financial report of Astronomy Australia Limited as an individual entity complies with all International Financial Reporting Standards (IFRS) in their entirety.

The following is a summary of the material accounting policies adopted by the company in the preparation of the financial report. The accounting policies have been consistently applied, unless otherwise stated.

Basis of Preparation

The accounting policies set out below have been consistently applied to all years presented.

Reporting basis and conventions

The financial report has been prepared on an accruals basis and is based on historical costs modified by the revaluation of selected non-current assets, financial assets and financial liabilities for which the fair value basis of accounting has been applied.

Income Tax

The Company is an income tax exempt charitable institution.

Notes to the financial statements for the year ended 30 June 2008

Accounting Policies

Property, Plant and Equipment

Each class of property, plant and equipment is carried at cost or fair value less, where applicable, any accumulated depreciation and impairment losses.

Plant and equipment

Plant and equipment are measured on the cost basis less depreciation and impairment losses.

The carrying amount of plant and equipment is reviewed annually by directors to ensure it is not in excess of the recoverable amount from these assets. The recoverable amount is assessed on the basis of the expected net cash flows that will be received from the assets' employment and subsequent disposal. The expected net cash flows have been discounted to their present values in determining recoverable amounts.

Depreciation

The depreciable amount of all fixed assets including building and capitalised lease assets, but excluding freehold land, is depreciated on a diminishing basis over their useful lives to the company commencing from the time the asset is held ready for use. Leasehold improvements are depreciated over the shorter of either the unexpired period of the lease or the estimated useful lives of the improvements.

Employee Benefits

Provision is made for the company's liability for employee benefits arising from services rendered by employees to balance date. Employee benefits that are expected to be settled within one year have been measured at the amounts expected to be paid when the liability is settled, plus related on-costs. Employee benefits payable later than one year have been measured at the present value of the estimated future cash outflows to be made for those benefits.

Notes to the financial statements for the year ended 30 June 2008

The amount recognised in the balance sheet represents the present value of the defined benefit obligations adjusted for any unrecognised actuarial gains and losses and unrecognised past service costs less the fair value of the plan's assets. Any asset recognised is limited to unrecognised actuarial losses, plus the present value of available refunds and reductions in future contributions to the plan.

Actuarial gains and losses are amortised over the expected average remaining working lives of the participating employees in the scheme. Gains or losses on the curtailment or settlement of a defined benefit plan are recognised in the income statement when the company is demonstrably committed to the curtailment or settlement.

Past services costs are recognised when incurred to the extent that benefits are vested, and are otherwise amortised on a straight-line basis over the vesting period.

Provisions

Provisions are recognised when the company has a legal or constructive obligation, as a result of past events, for which it is probable that an outflow of economic benefits will result and that outflow can be reliably measured.

Cash and Cash Equivalents

Cash and cash equivalents include cash on hand, deposits held at call with banks, other short-term highly liquid investments with original maturities of three months or less, and bank overdrafts. Bank overdrafts are shown within short-term borrowings in current liabilities on the balance sheet.

Revenue

Revenue from rendering a service is recognised upon the delivery of the service to customers.

Interest revenue is recognised on a proportional basis taking into account the interest rates applicable to the financial assets.

Notes to the financial statements for the year ended 30 June 2008

Goods and Services Tax (GST)

Revenues, expenses and assets are recognised net of the amount of GST, except where the amount of GST incurred is not recoverable from the Australian Tax Office. In these circumstances, the GST is recognised as part of the cost of acquisition of the asset or as part of an item of the expense. Receivables and payables in the balance sheet are shown inclusive of GST.

Cash flows are presented in the cash flow statement on a gross basis, except for the GST component of investing and financing activities, which are disclosed as operating cash flows.

Comparative Figures

When required by Accounting Standards, comparative figures have been adjusted to conform to changes in presentation for the current financial year.

Critical Accounting Estimates and Judgments

The directors evaluate estimates and judgments incorporated into the financial report based on historical knowledge and best available current information. Estimates assume a reasonable expectation of future events and are based on current trends and economic data, obtained both externally and within the company.

Key Estimates – Impairment

The company assesses impairment at each reporting date by evaluating conditions specific to the company that may lead to impairment of assets. Where an impairment trigger exists, the recoverable amount of the asset is determined. Value-in-use calculations performed in assessing recoverable amounts incorporate a number of key estimates.

No impairment has been recognized in respect of the year ended 30th June 2008.

The financial report was authorized for issue by the board of directors on 15th August 2008.

Overseas Optical Reserve

As part of the Australian Research Council's financial arrangements with Sydney University for paying for the Australian share of Gemini, a substantial reserve was established. When the ARC LIEF grant for Gemini was transferred from Sydney University to AAL, this "Gemini Reserve" was also transferred to AAL. AAL and the ARC have agreed that the primary use of this reserve would be to cover shortfalls in payments to overseas optical telescope facilities due to currency fluctuations. AAL therefore renamed this reserve the "Overseas Optical Reserve".

Notes to the financial statements for the year ended 30 June 2008

	2008 \$	2007 \$
2 Revenue		
Operating activities		
Operating Grants/Membership Subscriptions	10,940,695	215,910
Interest received – General Account	6,456	9
Interest received – Grants Account	823,281	6,655
Interest received – Overseas Optical Reserve Account	164,207	-
Total revenue	11,934,639	222,574
3 Auditor's Remuneration		
Auditor's Remuneration		
- Audit Services	2,100	2,000
4 Surplus		
Expenses		
Depreciation of property, plant and equipment	1,139	90
Bad Debts Written Off	5,000	-
Total bad and doubtful debts	5,000	-

Notes to the financial statements for the year ended 30 June 2008

	2008 \$	2007 \$
5 Cash and Cash Equivalents		
Current		
Term Deposit - Grant Account	3,700,000	-
Term Deposit - Overseas Optical Reserve Account	2,638,739	-
Term Deposit - Overseas Optical Reserve Account (Secured)	1,000,000	-
Cash at Bank - General Account	19,599	10,684
Cash at Bank - General Maximiser Account	62,465	25,009
Cash at Bank - Grant Account	596	2,000
Cash at Bank - Grant Maximiser Account	11,785,390	9,959,311
	19,206,789	9,997,004
6 Trade and Other Receivables		
Current		
Trade Debtors	-	3,040
Other Debtors	-	3,094
	-	6,134
7 Property, Plant and Equipment		
PLANT AND EQUIPMENT		
Plant and Equipment:		
At cost	9,326	2,149
Accumulated depreciation	(1,229)	(90)
Total Plant and Equipment	8,097	2,059
Office Furniture and Equipment		
Opening Balance	2,059	-
Purchases	7,177	2,149
Depreciation Expense	(1,139)	(90)
Closing Balance at 30th June 2008	8,097	2,059

Notes to the financial statements for the year ended 30 June 2008

	2008 \$	2007 \$
8 Trade and Other Payables		
Current		
NCRIS Grants to be allocated	10,772,469	9,052,500
LIEF Grants to be allocated	3,703,331	-
Other Creditors	13,746	12,957
GST Payable	197,172	914,611
	14,686,718	9,980,068
9 Provisions		
Provision for Recreational Leave	7,275	-
Total provisions	7,275	-
Analysis of Total Provisions		
Current	7,275	-
	7,275	-

Notes to the financial statements for the year ended 30 June 2008

	2008 \$	2007 \$
10 Retained Earnings		
Retained earnings at the beginning of the financial year	18,474	-
Net surplus attributable to members of the company	4,495,764	25,129
Transfer To Reserves	(4,499,219)	(6,655)
Transfer from Reserves	57,500	-
Retained earnings at the end of the financial year	72,519	18,474
Cash Flow Information		
11 Reconciliation of Cash		
Cash at the end of the financial year as shown in the Statement of Cash Flows is reconciled to the related items in the statement of Financial Position as follows:-		
Cash at Bank – General Account	19,599	10,684
Cash at Bank – General Maximiser Account	62,465	25,009
Cash at Bank – Grant Account	596	2,000
Cash at Bank – Grant Maximiser Account	11,785,390	9,959,311
Term Deposit – Grant Account	3,700,000	-
Term Deposit – Overseas Optical Reserve Account	2,638,739	-
Term Deposit – Overseas Optical Reserve Account (Secured)	1,000,000	-
	19,206,789	9,997,704
Reconciliation of Cash flow from Operations with Surplus after Income Tax		
Surplus from ordinary activities after tax	4,495,764	25,129
Non-cash flows in surplus (deficit)		
Depreciation	1,139	90
Changes in assets and liabilities, net of the effects of purchase and disposal of subsidiaries		
(Increase)/decrease in trade and other receivables	6,134	(6,134)
Increase/(decrease) in trade and other payables	4,706,650	9,980,068
Increase/(decrease) in current provisions	7,275	-
	9,216,962	9,999,153

Notes to the financial statements for the year ended 30 June 2008

12 Financial Instruments

Financial Risk Management

The company's financial instruments consists primarily of deposits with banks, accounts receivable and payable.

The company does not have any derivative instruments at 30 June 2008.

13 Key Management Personnel Compensation

	2008 \$	2007 \$
Total Compensation – Short Term Benefits (2008 – 2 people) (2007 – 1 person)	131,330	55,337
Total Compensation – Post Employment Benefits	-	-
	131,330	55,337

14 Capital & Leasing Commitments

There are no Capital or Lease Commitments

15 Segment Reporting

The company operates predominantly in one business and geographical segment being liaison with the astronomy community and managing capital grant funds to astronomy projects throughout Australia.

16 Economic Dependency Contingent Assets & Contingent Liabilities

The company receives the majority of its grant funds from the Department of Innovation, Industry, Science & Research (DIISR). This funding source establishes certain procedures for grant expenditure and acquittal. If grants are not expended and acquitted in accordance with grantor's procedures, the Grantor can refuse to make further grants and request repayments of grants made.

The company has entered into a long funding agreement with the Department of Innovation, Industry, Science & Research (DIISR) for the receipt of A\$45,000,000 over 5 years of which a portion is for the company's operating costs and the majority is for projects to be undertaken by third parties.

Notes to the financial statements for the year ended 30 June 2008

17 Financial Instruments

(a) Financial Risk Management

The company's financial instruments consist mainly of deposits with the National Australia Bank Ltd.

(b) Interest Rate Risk

The company's exposure to interest rate risk, which is the risk that a financial instrument's value will fluctuate as a result of changes in market interest rates and the effective weighted average interest rates on classes of financial assets and financial liabilities, is as follows:

	2008 \$	2007 \$
Cash & Cash Equivalent		
Cash at Bank – General Account	-	-
Cash at Bank – General Maximiser Account	7.10%	6.10%
Cash at Bank – Grant Account	-	-
Cash at Bank – Grant Maximiser Account	7.10%	6.10%
Term Deposit – Grant Account	7.83%	-
Term Deposit – Overseas Optical Reserve Account	8.06%	-
Term Deposit – Overseas Optical Reserve Account (Secured)	8.11%	-
Cash & Cash Equivalent		
Cash at Bank – General Account	19,599	10,684
Cash at Bank – General Maximiser Account	62,465	25,009
Cash at Bank – Grant Account	596	2,000
Cash at Bank – Grant Maximiser Account	11,785,390	9,959,311
Term Deposit – Grant Account	3,700,000	-
Term Deposit – Overseas Optical Reserve Account	2,638,739	-
Term Deposit – Overseas Optical Reserve Account (Secured)	1,000,000	-
	19,206,789	9,997,004

Notes to the financial statements for the year ended 30 June 2008

18 Forward US Dollar Contracts

The company has purchased forward dollar contracts with maturity dates between 1st July 2008 and 1st July 2010 totalling US\$4,822,907 (AUD\$5,644,127.56) for forward overseas commitments of present and future NCRIS Grants (2007 - \$Nil) secured with a Term Deposit of \$1,000,000.

19 Contingent Liability

During 2007/08 AAL made a commitment to purchase eight nights on the Magellan telescope during semester 2009A. As of 30th June 2008 the contracts for these nights were being negotiated. The expected cost of these eight nights is AUD\$200,000 + US\$184,000. With the agreement of the Australian Research Council, this purchase is to be taken from the Overseas Optical Reserve.

20 Company Details

Astronomy Australia Limited
C/- Swinburne University
John Street
Hawthorn. Vic. 3122.

Directors' Declaration

The directors of the company declare that:

1. The financial statements and notes, as set out on pages 31 to 58, are in accordance with the Corporations Act 2001:
 - (a) comply with Australian Accounting Standards and the Corporations Regulations 2001; and
 - (b) give a true and fair view of the financial position as at 30 June 2008 and of the performance for the year ended on that date of the company; and
2. In the directors' opinion there are reasonable grounds to believe that the company will be able to pay its debts as and when they become due and payable.

This declaration is made in accordance with a resolution of the Board of Directors.

Director:



Dr. Martin T. Cole

Director:



Prof. Warrick J. Couch

Dated this 15th day of August 2008

Report on the Financial Report

I have audited the accompanying financial report of Astronomy Australia Limited which comprises the balance sheet as at 30 June 2008, and the income statement, statement of changes in equity and cash flow statement for the year ended on that date, a summary of significant accounting policies and other explanatory notes and the directors' declaration.

Directors' Responsibility for the Financial Report

The directors of the company are responsible for the preparation and fair presentation of the financial report in accordance with Australian Accounting Standards (including the Australian Accounting Interpretations) and the Corporations Act 2001. This responsibility includes establishing and maintaining internal control relevant to the preparation and fair presentation of the financial report that is free from material misstatement, whether due to fraud or error; selecting and applying appropriate accounting policies; and making accounting estimates that are reasonable in the circumstances. In Note 1, the directors also state, in accordance with Accounting Standard AASB 101: "Presentation of Financial Statements", that compliance with the Australian equivalents to International Financial Reporting Standards (IFRS) ensures that the financial report, comprising the financial statements and notes, complies with IFRS.

Auditor's Responsibility

My responsibility is to express an opinion on the financial report based on my audit. I conducted my audit in accordance with Australian Auditing Standards. These Auditing Standards require that I comply with relevant ethical requirements relating to audit engagements and plan and perform the audit to obtain reasonable assurance whether the financial report is free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial report. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial report, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial report in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by the directors, as well as evaluating the overall presentation of the financial report.

I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my audit opinion.

Independence

In conducting my audit, I have complied with the independence requirements of the Corporations Act 2001. I confirm that the independence declaration required by the Corporations Act 2001, provided to the directors of Astronomy Australia Limited on 15th August 2008, would be in the same terms if provided to the directors as at the date of this auditor's report.

Astronomy Australia Limited A.B.N 19 124 973 584

**Independant Auditor's Report to the members of
Astronomy Australia Limited**

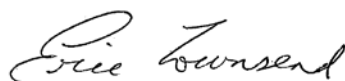
Auditor's Opinion

In my opinion:

- (a) The financial report of Astronomy Australia Limited is in accordance with the Corporations Act 2001, including:
 - (i) giving a true and fair view of the company's financial position as at 30 June 2008 and of its performance for the year ended on that date; and
 - (ii) complying with Australian Accounting Standards (including the Australian Accounting Interpretations) and the Corporations Regulations 2001.
- (b) The financial report also complies with International Financial Reporting Standards as disclosed in Note 1.

Name of Firm: E. Townsend & Co.
Chartered Accountant

Name of Principal:



Eric Townsend

Address: 35 Mereweather Avenue, Frankston. Vic. 3199.

Dated this 15th day of August 2008

Profit and Loss Statement for the year ended 30 June 2008

	2008 \$	2007 \$
REVENUE		
Administration Grant - NCRIS	237,140	183,500
Membership Subscriptions - Level 1	135,000	27,360
Membership Subscriptions - Level 2	25,000	5,050
Gemini Reserve Received	3,512,032	-
Grants Allocated	7,031,523	-
	10,940,695	215,910
LESS: GRANTS PAID		
Grants Paid	7,031,523	-
Grants Paid from Reserves	57,500	-
	7,089,023	-
GROSS SURPLUS FROM TRADING	3,851,172	215,910
OTHER INCOME		
Interest Received - General Account	6,456	9
Interest Received - Grants Account	823,281	6,655
Interest Received - Overseas Optical Reserve Account	164,207	-
	993,944	6,664
	4,845,616	222,574

The accompanying notes form part of these financial statements

Profit and Loss statement for the year ended 30 June 2008

	2008 \$	2007 \$
EXPENSES		
Accountancy & Company Secretary Fees	41,085	18,265
Auditor's Remuneration	2,100	2,000
Bad Debts Written Off	5,000	-
Bank Charges	716	36
Contract Staff	6,691	-
Depreciation	1,139	90
Filing Fees	375	-
Insurance	6,094	5,810
Legal Costs	29,230	87,118
Meeting Expenses	21,355	-
Printing & Stationery	3,137	1,541
Promotion Expenses	-	1,080
Salary Reimbursement	-	28,825
Salaries	119,944	24,323
Salaries - Board	33,312	12,200
Software	675	-
Subscriptions	714	360
Superannuation - Board	11,262	1,098
Superannuation Contributions	11,386	2,189
Telephone	584	250
Travel - Staff	19,778	1,723
Travel - Board	21,503	3,209
Travel - Board - Salary	12,785	3,723
Workcare	657	270
Website Expenses	330	3,335
	349,852	197,445
Surplus before income tax	4,495,764	25,129

The accompanying notes form part of these financial statements





Appendix Astronomy NCRIS Progress Report

Image Credit: Gemini Observatory/AURA



Astronomy NCRIS Progress Report

Access and Pricing

The access and pricing arrangements described in section 3, “Access and Charging Arrangements” of the Project Plan remain unchanged and are unlikely to change in the future. The arrangements for existing infrastructure have been operating successfully for many years and have been leveraged in devising the arrangements outlined for future infrastructure.

Deviations from the Project Plan

- The PILOT project has been de-scoped from a *detailed* design study with error margins of 10% to a *concept* design study with error margins of 35%. The design requirements had expanded because of a tower, enclosure and other unforeseen complexity, but much risk had been retired.
- The Anglo-Australian Observatory will receive a cash advance of \$1.5M during 2008/09. This funding comes from the existing AAO NCRIS project to build a new instrument for the AAT and will cover the shortfall in the AAO operations budget while the Astronomy Roadmap is being developed. The Astronomy Roadmap will therefore need to address the \$1.5M required to complete the new AAT instrument.
- Phase 1 of the MWA project is under development, but is expected to be de-scoped from the planned 512T system. The AAL Board will continue to monitor the progress with Phase 1 and has set the milestone that NCRIS funding will only be available after an end-to-end 32 tile system is demonstrated.
- The Aspen program has been de-scoped with the Precision Radial Velocity Spectrograph instrument cancelled and only *design* studies for the WFMOS instrument funded at this stage.

Progress against Milestones

A. Governance			
Milestone	Due	Completed	Comments
Strategic Options process approved	Sep 2007	Mar 2008	
Hire additional staff to assist the COO of AAL	Sep 2007	July 2007	0.4FTE hired Jul 07 and 0.8FTE hired Jun 08
Elect Chair and full board of directors	Sep 2007	July 2007	
Second board meeting held	Sep 2007	Aug 2007	
Director remuneration agreed upon	Sep 2007	July 2007	
Annual general meeting with the full participation of all members held	Sep 2007	July 2007	
Establish membership fees for 2007/08	Sep 2007	July 2007	
Establish the Australian GMT Advisory Committee	Sep 2007	Sep 2007	
Formalise relationship with the Australian Antarctic Astronomy Advisory Committee (AAAAAC) and incorporate it under AAL	Sep 2007	Oct 2007	
NCRIS progress report published	Sep 2007	Nov 2007	
Third board meeting held	Dec 2007	Oct 2007	
ASKAP contract with CSIRO signed	Dec 2007	Jun 2008	
Fourth board meeting held	Mar 2008	Feb 2008	
Fifth board meeting held	Jun 2008	Apr 2008	

Progress against Milestones cont.

A. Governance				
Milestone	Due	Completed	Comments	
2008/09 Annual Business Plan approved	Apr 2008	Ongoing	Draft available in April 2008, final plan expected Jul 08	
Establish a single advisory committee to cover all optical/IR astronomy infrastructure (AAT + 8m class telescopes)	Jun 2008	Ongoing	Milestone to be carried forward to 2008/09, to allow for completion of the ANSOC process	
Establish a facility ownership model appropriate for Australian astronomy infrastructure	Jun 2008	Superseded	Now being considered as part of the Astronomy Roadmap process, due to report in October 2008	
MWA contract with the University of Melbourne signed	Jun 2008	Ongoing	MWA phase 1 is expected to be de-scoped from the planned 512T system. AAL continues to monitor the progress of phase 1, and may be in a position to sign this contract to start phase 2 by Jul 09 or earlier	
Identify Australia's financial commitment to the Aspen instrument program over the life of the NCRIS grant (dependent on international committee timelines)	Jun 2008	Jun 2008	Progress on the Aspen instrument program has been slower than anticipated and the program has been de-scoped. Australia's 6.19% commitment over the life of the Astronomy NCRIS program is known, but future commitments beyond Jun 2011 are yet to be determined	

Progress against Milestones cont.

B. Research Infrastructure			
AAO – Refurbishment of facilities ¹			
Milestone	Due	Completed	Comments
Initialise AAT infrastructure refurbishment project	Sep 2007	Sep 2007	
Hire project manager	Sep 2007	Apr 2007	
Identify suitable consultants	Sep 2007	Completed	
Commence design of air conditioning chiller replacement	Sep 2007	Completed	Concept design completed
Tender for purchases of replacement of capital equipment	Sep 2007	Ongoing	Some capital equipment for mechanical workshop has been purchased, with the rest spread over the next five years
Prepare program for instrumentation refurbishment	Sep 2007	Completed	
Prepare program for architectural and building works	Sep 2007	Completed	Program prepared. Most of the building works are scheduled for years 2 and 3
Commission inspection and report phase activities on AAT dome subsystems	Sep 2007	Ongoing	<ul style="list-style-type: none"> • An inspection of all lifting equipment has been carried out including the shutter, maintenance platform, cranes and tube access platform • Interlock cubicle design completed - under pre installation review by electronics group • Replacement braking system for maintenance platform & shutter in design phase

¹ Several tasks within the refurbishment project have been rescheduled for a later date. A revised statement of work was received from the AAO during 2007/08 to reflect these changes.

Progress against Milestones cont.

B. Research Infrastructure			
AAO – Refurbishment of facilities			
Milestone	Due	Completed	Comments
Commission inspection and report phase activities on infrastructure subsystems	Sep 2007	Ongoing	<p>Deferred to 2008/09.</p> <ul style="list-style-type: none"> • Work on the mirror elevator is planned to be carried out in-house, but has been delayed due to other works. • The main floor hatch has been delayed due to poor performance by a contractor. A new contractor has been engaged and works on both the mirror elevator and the 2nd floor hatch will take place in 2008-09 Q2.
Commission inspection and report phase activities on AAT telescope subsystems	Dec 2007	Ongoing	<ul style="list-style-type: none"> • Telescope mount completed. • Main drive and control: deferred to 2008-09 Q1 & planned to commence by in-house staff. • Hydrostatic support system: specialist contractor contacted and awaiting site visit. • Telescope Optics: deferred to 2008-09 Q2 & planned to commence by in-house staff. • Mirror support systems and encoders: Dome & telescope encoders identified and ordered

Progress against Milestones cont.

B. Research Infrastructure AAO – Refurbishment of facilities Milestone				Due	Completed	Comments
Commission inspection and report phase activities on architectural and building subsystems				Dec 2007	Ongoing	<ul style="list-style-type: none"> Fabric, HVAC and hydraulic lifts complete Plan to start work on electrical in 2008-09 Q3 when an electrician is employed
Scope and design works for instrumentation refurbishment work packages				Dec 2007	Completed	
Scope and design works for architectural and building refurbishment work packages				Dec 2007	Completed	
Scope and design HVAC work packages				Dec 2007	Ongoing	Started: expected to be completed by Q4 Delays due to re-design
Consultants and specialists undertake inspections and deliver reports on telescope subsystems				Dec 2007	Ongoing	Work on the telescope sub-systems has started with in-house staff
Tender for air conditioning chiller replacement				Mar 2008	Ongoing	Chillers have been purchased and the installation tender in progress
Consultants and specialists undertake inspections and report on dome subsystems				Mar 2008	Ongoing	Scheduled to be carried out in-house starting Sep 2008
Review reports and prepare tenders for dome subsystems refurbishment				Mar 2008	Ongoing	To be carried out by in-house staff

Progress against Milestones cont.

B. Research Infrastructure AAO – Refurbishment of facilities Milestone				
	Due	Completed	Comments	
Consultants and specialists undertake inspections and deliver reports on architectural and building subsystems	Mar 2008	Completed		
Review reports and prepare tenders for architectural and building systems refurbishment	Mar 2008	Completed		
Identify architectural and building refurbishment work packages for internal and external resources, tendering as required	Mar 2008	Completed		
Sign contract for air conditioning chiller replacement	Mar 2008	Ongoing	Scheduled for Aug 2008	
Review reports and prepare tenders for telescope subsystems refurbishment	Mar 2008	Ongoing	Scheduled to be carried out by in-house staff in 2008-09	
Sign contracts for telescope subsystems refurbishment	Mar 2008	Ongoing	Scheduled to be carried out by in-house staff in 2008-09	
Commission inspection and report phase activities on infrastructure subsystems	Jun 2008	Ongoing	Manufacturer contacted; awaiting site visit	
Identify instrumentation refurbishment work packages for internal and external resources, tendering as required	Jun 2008	Ongoing	Started by in-house staff	
Commence telescope subsystem works	Jun 2008	Completed		

Progress against Milestones cont.

B. Research Infrastructure AAO – Refurbishment of facilities Milestone				Due	Completed	Comments
Commence miscellaneous instrumentation works				Jun 2008	Completed	
Commence miscellaneous architectural and building works				Jun 2008	Completed	
Sign contracts for dome subsystems refurbishment				Jun 2008	Ongoing	To be carried out in-house
Sign contracts for architectural and building works				Jun 2008	Completed	
Sign contracts for instrumentation refurbishment				Jun 2008	Ongoing	To be carried out in-house
Install and commission air conditioning chiller replacement				Jun 2008	Ongoing	Deferred to 2008-09 Q1-2
Review reports and prepare tenders for infrastructure subsystems refurbishment				Jun 2008	Completed	
Sign contracts for infrastructure subsystems refurbishment				Jun 2008	Completed	
Commence telescope subsystems refurbishment works				Jun 2008	Completed	
Commence architectural and building refurbishment works				Jun 2008	Ongoing	Work started with contractors and in-house staff
Ongoing miscellaneous works				Ongoing	Ongoing	

Progress against Milestones cont.

AAT – New Instrument Milestone			
	Due	Completed	Comments
Initialise new AAT instrument project	Sep 2007	Sep 2007	
Appoint project manager, project scientist and other key members of project team	Sep 2007	Sep 2007	
Start conceptual design study	Sep 2007	Sep 2007	
Explore nominal and alternative conceptual designs	Sep 2007	Sep 2007	
Develop revised science cases	Sep 2007	Nov 2007	Extended until presentation date in November
Hold community workshop to discuss science case and conceptual design	Dec 2007	Nov 2007	Held 7 November 2007 with 43 participants
Draft initial science requirements document	Dec 2007	Dec 2007	
Draft initial functional requirements document	Dec 2007	Dec 2007	
Complete initial science requirements document	Mar 2008	Mar 2008	
Complete initial functional requirements document	Mar 2008	Mar 2008	
Write conceptual design report	Mar 2008	May 2008	Initial instrument selection process took longer than anticipated
Hold conceptual design review	Mar 2008	May 2008	Held 15 May 2007
Solicit feedback from user community on final conceptual design review	Mar 2008	Jun 2008	
Complete conceptual design study	Mar 2008	Jun 2008	
AAT Board to decide on instrument (AAL Board to review in 2008/09 Q1)	Jun 2008	Mar 2008	Completed – 31 March 2008. AAT Board decided to progress the HERMES high-resolution spectrograph to a concept level
Start preliminary design phase	Jun 2008	Jun 2008	

Progress against Milestones cont.

Australian Membership of the Gemini International Partnership			
Milestone	Due	Completed	Comments
Continue current level of support for RSAA-based AuGO	Sep 2007	Ongoing	
Begin recruitment of Australian Gemini Scientist (AGS)	Sep 2007	Oct 2007	Applications closed 15 October
Begin recruitment of Australian Deputy Gemini Scientists (DGS)	Sep 2007	Oct 2007	Applications closed 15 October
Continue current level of support for RSAA-based AusGO	Dec 2007	Dec 2007	
Complete recruitment of AGS	Dec 2007	Dec 2007	
Complete recruitment of Australian DGS	Dec 2007	Dec 2007	
Prepare for AusGO transfer from RSAA to AAO	Dec 2007	Dec 2007	
Payment of access costs associated with Australia's 6.19% share in Gemini via the Sydney University Trust Fund ceases	Dec 2007	Dec 2007	
AusGO begins operations from AAO with new AGS and DGS	Mar 2008	Jan 2007	
New joint NCRIS/ARC LIEF funding arrangement commences, with AAL becoming the recipient of both sources of funding	Mar 2008	Jan 2008	
Payment for access for the first half of 2008 to be made	Mar 2008	Mar 2008	
AusGO supports Australian involvement in 8m-class telescopes by: <ul style="list-style-type: none"> managing Australian time allocation processes for both Gemini and Magellan AGS and DGS performing specified Gemini support duties supporting Gemini instruments as required managing the two Magellan support astronomers 	Ongoing	Ongoing	<ul style="list-style-type: none"> Australian Gemini Scientist attended Gemini Operations Working Group meeting in Hilo 30-31 January Semester 2008B Call for Proposals released 1 March
AusGO supports Australian involvement in 8m-class telescopes	Ongoing	Ongoing	

Progress against Milestones cont.

GMT Design Development Phase				
Milestone	Due	Completed	Comments	
MoU signed between the ANU and AAL relating to the GMT DDP and Australian engagement with GMT should GMT proceed to construction. This MoU also states that AAL and ANU will agree to each appoint one of the two board representatives to the GMT Board, with each approving both nominees	Sep 2007	Jun 2008		
Initial design study contracts for GMT DDP let	Mar 2008	Ongoing	<p>While it was anticipated that the GMT Organisation would commence the DDP during 2007/08, the majority of work has yet to be defined by the GMT Project Office in Pasadena, which has only just begun to populate its staff requirements</p> <p>In addition, the Founders Agreement, the financially binding document that the GMT Partners must sign before the DDP can continue at proper speed, is not yet ratified and hence the preparation of DDP Work Package Descriptions (WPD) has not commenced</p>	
Preliminary instrument study reports for GMT DDP due	Jun 2008	Ongoing	The delay in commencing the DDP has pushed this deadline out as well	
Review of all aspects of Australia's involvement in the GMT Project including the nature and constitution of the Australian membership	Jun 2008	Superseded	Progress with the GMT DDP has been slow, and progress will now be considered as part of the ANSOC deliberations	
AAL to provide advice to the NCRIS Committee on the possible expenditure of the strategic options component of the NCRIS funds on the second and/or third year of the DDP	Jun 2008	Ongoing	This milestone is not due until Q2 2008/09	

Progress against Milestones cont.

Australian GMT Project Office			
Milestone	Due	Completed	Comments
AGMTPO staff in place	Sep 2007	Nov 2007	Project Office Manager started 19 November 2007
First AGMTAC meeting completed	Sep 2007	Sep 2007	Held 7 September 2007
Quarterly report to AAL	Sep 2007	Oct 2007	Submitted 22 October 2007
Industry database online	Dec 2007	Feb 2008	
Second AGMTAC meeting completed	Dec 2007	Jan 2008	Held 15 January 2008
Quarterly report to AAL	Dec 2007	Jan 2008	Submitted 30 January 2008
Draft AAL DDP funding justification circulated	Mar 2008	Mar 2008	
Third AGMTAC meeting completed	Mar 2008	Apr 2008	Held 17 April 2008
Quarterly report to AAL	Mar 2008	Apr 2008	Submitted 11 April 2008
Revised AAL DDP funding justification circulated	Jun 2008	Ongoing	Scheduled for July 2008
Fourth AGMTAC meeting completed	Jun 2008	Ongoing	Scheduled for July 2008
Final AAL DDP funding justification submitted	Jun 2008	Ongoing	Scheduled for July 2008

Progress against Milestones cont.

PILOT Design Study			
Milestone	Due	Completed	Comments
Australian Antarctic Astronomy Advisory Committee (AAAAC) formed	Sep 2007	Oct 2007	31 October 2007 AAAAC incorporated as an AAL advisory committee
Risk Workshop convened. Outcomes will be a high-level risk management strategy with options identified and rated by importance. The deliverables will be an Executive Summary and a Risk Assessment Report	Sep 2007	Sep 2007	The project management firm SKM were engaged to conduct a Risk Workshop on PILOT. The Workshop produced a Risk Assessment Report and an Executive Summary. A total of 29 hazards and risks were identified and ranks according to likelihood and impact
Project Leader, Project Manager and Telescope Scientist appointed	Sep 2007	Sep 2007	Project Leader: John Storey Project Manager: David Ward (replaced 6 February 2008 by Dr Roger Haynes) Telescope Scientist: Will Saunders
Subcontract for technical work let to AAO	Sep 2007	Sep 2007	Let to the AAO and signed on 24 September 2007
Negotiation commenced with potential European and US partners on additional Design Phase and Construction Phase contributions	Sep 2007	Sep 2007	The Project Leader has made three visits to Europe to commence negotiations with potential partners and telescope manufactures. A further two European visits have been made by the Telescope Scientist
Quarterly report to AAL	Sep 2007	Oct 2007	Submitted 22 October 2007
Sub-contracts let for PILOT design work packages	Dec 2007	Feb 2008	

Progress against Milestones cont.

PILOT Design Study Milestone				
<p>Open meeting of Australian astronomical community to discuss instrumentation requirements</p> <p>Quarterly report to AAL</p> <p>Mid-project review convened. Outcomes will include a report identifying the remaining risks and a strategy to buy down these risks during the remaining period of the Design Phase</p> <p>Quarterly report to AAL</p> <p>Design Review of PILOT project convened. Outcomes will be:</p> <ul style="list-style-type: none"> • A final report that includes a detailed costing for the construction and whole-of-life operation for the 2.4 metre PILOT telescope. These costings will be justified with supporting documentation from potential vendors, and are expected to be accurate to within 10% • Identification of any remaining risks; and an approved risk mitigation strategy • Identification of potential construction contractors and a spend profile for the Construction Phase <p>Quarterly report to AAL. Report will include identification of international partners, their degree of commitment, and readiness to enter into formal agreements for the Construction Phase</p> <p>Detailed report on the site characteristics at Dome C, with particular attention to atmospheric seeing and turbulence, together with a detailed science case for PILOT.</p>	Due	Completed	Comments	
	Dec 2007	Jun 2008	At the January 2008 meeting of AAAAC it was agreed that a preferred alternative to a single meeting would be a "Roadshow" to the major astronomical centres. This Roadshow visited 7 Centres and concluded with its last presentation on 5 June 2008	
	Dec 2007	Jan 2008	Submitted 30 January 2008	
	Mar 2008	Apr 2008	Convened 16 April 2008	
	Mar 2008	Apr 2008	Submitted 16 April 2008	
	Jun 2008	Ongoing	Scheduled for July 2008	
	Jun 2008	Ongoing	Scheduled for July 2008	
	Jun 2008	Ongoing	Scheduled for July 2008	
	Jun 2008	Ongoing	Scheduled for July 2008	

Progress against Milestones cont.

C. Promotion Milestone			
Quarterly newsletters published	Ongoing	Ongoing	All quarterly newsletters published on the AAL website within 2 weeks of the Board meeting
Presentations where appropriate at committee/staff meetings	Ongoing	Ongoing	Presentations made at several advisory committee meetings throughout the year

PILOT Design Study Milestone			
PILOT Project web site on-line, hosted by AAO	Sep 2007	Sep 2007	
PILOT project presented at Second ARENA Conference in Berlin, September 2007. Science, technology and logistical presentations by PILOT team	Sep 2007	Sep 2007	PILOT project made three presentations at the Second ARENA Conference, Berlin, in September 2007

Progress against Milestones cont.

Australian GMT Project Office				
Milestone	Due	Completed	Comments	
Travel to a GMT project scientists working group meeting at GMT project office in Pasadena	Sep 2007	Sep 2007		
Disseminate information on opportunities offered by the GMT at a national meeting of academics	Sep 2007	Sep 2007		
A webpage for the AGMTPO made available online and webpage maintenance initiated	Sep 2007	Sep 2007		
Public brochure completed	Dec 2007	Mar 2008	Released 20 March 2008. Copies were distributed at the Science meeting and the Public Lecture. It is also available as a download from the ANU/RSAA/GMT web page	
Industry brochure completed	Dec 2007	Mar 2008	Released 20 March 2008. Copies were distributed at the Science meeting and is also available as a download from the ANU/RSAA/GMT web page	
Promotional material presented to Minister of DEST and Chief Scientist	Mar 2008	Mar 2008	Achieved at the ANU VC's Retreat on 7 February 2008 and during the GMT Science Meeting cocktail evening on 25 March 2008	

List of Astronomy NCRIS cash receipts and payments - grant allocations (GST exclusive)

Facility	Item	Transaction Type	From / To	Budget Receipts	Budget Payments	Actual Receipts	Actual Payments
Gemini	ASPEN	Receipts	GSKA MNRF	\$850,582		\$820,561	
Gemini	ASPEN	Receipts	GSKA MNRF	\$374,518		\$414,733	
AAO	AAT instrument	Payments - Capital	AATB		\$200,000		\$200,000
AAO	AAT refurbishment	Payments - Operating	AATB		\$250,000		\$250,000
GMT	GMT PO	Payments - Operating	ANU		\$90,000		\$90,000
PILOT	PILOT Design Study	Payments - Operating	UNSW		\$280,000		\$280,000
AAO	AAT instrument	Payments - Capital	AATB		\$200,000		\$200,000
AAO	AAT refurbishment	Payments - Operating	AATB		\$250,000		\$250,000
GMT	GMT DDP	Payments - International Access	GMT PO (USA)		\$1,111,111		\$1,111,111
CSIRO	ASKAP	Payments - Capital	CSIRO		\$654,600		\$1,000,000
CSIRO	ASKAP	Payments - Capital	CSIRO		\$785,520		\$0
PILOT	PILOT Design Study	Payments - Operating	UNSW		\$280,000		\$280,000
Gemini	Gemini operations	Receipts	ARC	\$59,025		\$48,337	
Gemini	Gemini operations	Payments - International Access	NSF (USA)		\$59,025		\$48,337
AAO	AAT instrument	Receipts	NCRIS	\$1,470,000		\$1,470,000	

List of Astronomy NCRIS cash receipts and payments - grant allocations (GST exclusive)

Facility	Item	Transaction Type	From / To	Budget Receipts	Budget Payments	Actual Receipts	Actual Payments
AAO	AAT refurbishment	Receipts	NCRIS	\$1,150,000		\$1,150,000	
Gemini	ASPEN	Receipts	NCRIS	\$1,238,000		\$1,238,000	
Gemini	AusGO	Receipts	NCRIS	\$300,000		\$300,000	
Gemini	Gemini operations	Receipts	NCRIS	\$1,596,692		\$1,596,692	
GMT	GMT PO	Receipts	NCRIS	\$64,560		\$64,560	
CSIRO	ASKAP	Receipts	NCRIS	\$308,608		\$308,608	
PILOT	PILOT Design Study	Receipts	NCRIS	\$440,000		\$440,000	
AAO	AAT instrument	Payments - Capital	AATB		\$200,000		\$200,000
AAO	AAT refurbishment	Payments - Operating	AATB		\$300,000		\$300,000
Gemini	ASPEN	Payments - International Access	NSF (USA)		\$1,238,000		\$315,193
Gemini	AusGO	Payments - Operating	AATB		\$75,000		\$75,000
Gemini	Gemini operations	Receipts	ARC	\$900,000		\$900,000	
GMT	GMT PO	Payments - Operating	ANU		\$81,000		\$81,000
CSIRO	ASKAP	Payments - Capital	CSIRO		\$883,710		\$0
PILOT	PILOT Design Study	Payments - Operating	UNSW		\$280,000		\$280,000
Gemini	Gemini operations	Payments - International Access	NSF (USA)		\$450,000		\$450,000

List of Astronomy NCRIS cash receipts and payments - grant allocations (GST exclusive)

Facility	Item	Transaction Type	From / To	Budget Receipts	Budget Payments	Actual Receipts	Actual Payments
Gemini	Gemini operations	Payments - International Access	NSF (USA)		\$798,346		\$645,717
AAO	AAT instrument	Payments - Capital	AATB		\$420,000		\$420,000
AAO	AAT refurbishment	Payments - Operating	AATB		\$300,000		\$300,000
Gemini	AusGO	Payments - Operating	AATB		\$75,000		\$75,000
GMT	GMT PO	Payments - Operating	ANU		\$20,200		\$20,200
CSIRO	ASKAP	Payments - Capital	CSIRO		\$949,170		\$0
PILOT	PILOT Design Study	Payments - Operating	UNSW		\$160,000		\$160,000
TOTAL				\$8,751,985	\$10,390,682	\$8,751,491	\$7,031,558

The actual receipts are approximately 100% relative to the budget, whereas the actual payments are only 68% relative to the budget. The significant changes compared to budget are: the de-scope of the Aspen programme (\$922,807 less than budget during 2007/08); the new cash-flow profile for ASKAP (\$2,273,000 less than budget during 2007/08); and the favourable exchange rates associated with the Gemini Operations payments (\$152,629 less than budget during 2007/08). These changes have resulted in an update of the Astronomy NCRIS plan summarised in the 2008/09 Astronomy NCRIS business plan.

The above payments of \$7,031,558 are confirmed in the financial statements. (See Profit and Loss Statement – Grants Paid \$7,031,523. Note: \$35 discrepancy.)

The above payments of \$8,751,491 are confirmed in the financial statements. (See note 8 in both 2007/08 and 2006/07 financial statements: increase in balance of NCRIS grants held by AAL from above table = \$8,751,491 - \$7,031,558 = \$1,719,933; increase in balance of NCRIS grants held by AAL from financial statements = \$10,772,469 - \$9,052,500 = \$1,719,969. Note: \$36 discrepancy.)

List of Astronomy NCRIS cash receipts and payments - AAL operations (GST exclusive)

Facility	Item	Transaction Type	From / To	Budget Receipts	Budget Payments	Actual Receipts	Actual Payments
AAL	AAL Operations	Receipts	AAL members	\$163,040		\$158,040	
AAL	AAL Operations	Payments - Operating	AAL		\$119,058		\$107,712
AAL	AAL Operations	Receipts	NCRIS	\$237,140		\$237,140	
AAL	AAL Operations	Payments - Operating	AAL		\$237,140		\$237,140
TOTAL				\$400,180	\$356,198	\$395,180	\$344,852

The above payments of \$349,852 are confirmed in the financial statements. (See Profit and Loss Statement – Expenses, excluding bad debts of \$5,000.)

The above receipts of \$237,140 for the administration fee taken from the Astronomy NCRIS grant is confirmed in the financial statements.
(See Profit and Loss Statement – Revenue.)

The above receipts of \$158,040 from Members are confirmed in the financial statements. (See Profit and Loss Statement – Revenue: Membership Subscriptions Level 1 \$135,000 + Level 2 \$25,000 = \$160,000. Profit and Loss Statement – Expenses: Bad Debts \$5,000. Net \$155,000. Note: \$3,040 discrepancy is due to a single level 1 pro-rata membership fee invoiced in 2006/07 and received in 2007/08.)

List of Astronomy NCRIS in-kind contributions (GST exclusive)

Facility	Item	Transaction Type	From / To	Budget Receipts	Budget Payments	Actual Receipts	Actual Payments
Gemini	Gemini operations	Receipts	ARC	\$803,669		\$803,669	
Gemini	Gemini operations	Payments - International Access	NSF (USA)		\$803,669		\$803,669
GMT	GMT PO	Receipts	ANU	\$132,200		\$132,200	
GMT	GMT PO	Payments - Operating	ANU		\$132,200		\$132,200
PILOT	PILOT Science Centre	Receipts	UNSW	\$167,000		\$73,645	
PILOT	PILOT Science Centre	Payments - Operating	UNSW		\$167,000		\$73,645
TOTAL				\$1,102,869	\$1,102,869	\$1,009,514	\$1,009,514

The in-kind receipts and payments are confirmed in the letters from the participating organisations (see letters below). The letter from UNSW comments on the actual contribution relative to budget.

List of Astronomy NCRIS Reserve receipts and payments (GST exclusive)

Facility	Item	Transaction Type	From / To	Budget Receipts	Budget Payments	Actual Receipts	Actual Payments
TBD	TBD	Receipts	Interest	\$550,000		\$822,980	
ASKAP	ASKAP meeting	Payments - Operating	UWA		\$0		\$10,000
GMT	GMT meeting	Payments - Operating	ANU		\$0		\$10,000
TOTAL				\$550,000	\$0	\$822,980	\$20,000

The amount of interest earned was 150% relative to budget. This was due to the decreased payments regarding Aspen, ASKAP and Gemini (noted above), the several month delay in paying for the GMT DDP, and the increase in interest rates available in Australia.

The interest earned by the NCRIS grant is allocated to the Astronomy NCRIS Reserve, and payments are drawn from that reserve to pay for activities related to the Astronomy NCRIS. The above receipts and payments are confirmed in the financial statements (see Statement of Changes in Equity).

Note: The \$822,980 allocated to the Astronomy NCRIS Reserve is the Interest earned by the Astronomy NCRIS minus bank fees associated with the Astronomy NCRIS bank accounts.

ANU Statement confirming In-kind Contribution



Albert Eichholzer
Acting Business Officer
Research School of Astronomy & Astrophysics
Mt Stromlo Observatory
Cotter Road
Weston ACT 2611 Australia

T: +61 2 6125 8905
F: +61 2 6125 0233
E: Albert.Eichholzer@anu.edu.au
W: www.mso.anu.edu.au

Mark McAuley
Chief Operating Officer
Astronomy Australia Ltd
C/O Swinburne University of Technology
1 Alfred Street
Hawthorn VIC 3122

Friday, 11 July 2008

Dear Mr McAuley:

ANU Contribution to the Astronomy NCRIS Australian GMT Project Office

This letter confirms that the Australian National University, through the Research School of Astronomy and Astrophysics, made in-kind contributions of staff time to the value of \$132,200 to the Australian Giant Magellan Telescope Project Office during the 2007/08 financial year.

I would like to thank you for your ongoing support of the project.

Regards,

Albert Eichholzer

ARC Statement confirming In-kind Contribution



Australian Government
Australian Research Council

Postal address GPO Box 2702
Canberra ACT 2601 Australia
Physical address 1st Floor, 8 Brindabella Circuit
Brindabella Business Park
Canberra Airport ACT 2609
Australia
T + 61 2 6287 6600
F + 61 2 6287 6601
www.arc.gov.au

24 October 2007

ARC project ref: LE0668351

Mark McAuley
Chief Operating Officer
Astronomy Australia Ltd
c/o Swinburne University of Technology
Mail H39 - Centre for Astrophysics and Supercomputing
1 Alfred Street
Hawthorne, Victoria 3122

Dear Mr McAuley

ARC GEMINI PAYMENTS IN 2006/07

Thank you for your email of 29 August 2006 requesting confirmation of payments made to the NSF for the Gemini Project. You will be aware that the ARC has been providing funding to the University of Sydney as the Administering Organisation for the Gemini project until the recent execution of a Deed of Novation transferring the ARC grant to Astronomy Australia Ltd which will now administer the grant.

As part of the Novation of the Deed the University of Sydney sent a reconciliation statement to the ARC showing all funds received for the grant and dispensed to the United States of America's National Science Foundation (NSF) to support Gemini under an international MOU. The funds paid to the NSF may include ARC, other University and other organisation contributions.

The reconciliation statement shows the funds paid as:

Gemini funds paid out to the US NSF in July '06, March'07 and July'07

Ledger Description	Due	Paid	Amount AUD
NATIONAL SCIENCE 2ND HALF CONT	1-Jul-06	26-Jul-06	\$ 912,353.64
E190307 NATIONAL SF GEMINI HALF C	15-Mar-07	20-Mar-07	\$ 878,008.75
NATIONAL SCIENCE AUST CONST	1-Jul-07	27-Jul-07	\$ 803,669.34
Total			\$ 2,594,031.73

If you require further information, please contact Dr Stan Miller, Assistant Director, Linkage Infrastructure, Equipment and Facilities scheme on 02 6287 6670.

Regards,

Andrew Cameron
Director, Finance
Australian Research Council

UNSW Statement confirming In-kind Contribution

THE UNIVERSITY OF NEW SOUTH WALES

P O BOX 1 • KENSINGTON • NEW SOUTH WALES 2033 • AUSTRALIA

FACSIMILE (02) 663 3420 • TELEPHONE (02) 697 4566



SCHOOL OF PHYSICS

11th July 2008

Mr. Mark McAuley
Chief Operating Officer
Astronomy Australia Ltd.,
C/o Swinburne University of Technology (H39 CASC)
1 Alfred Street, Hawthorn.
VIC3122

Dear Mark,

UNSW Contribution Towards the PILOT Science Office

I am pleased to confirm that UNSW will contribute a total amount of \$250,000 towards the PILOT Science Office according to the AAL - UNSW sub-contract.

However, the amount contributed for each financial year is slightly different from that stated on the sub-contract because of the mismatch between UNSW's and AAL's financial years. The financial year for UNSW is from 1 January to 31st December but for AAL, the financial year is from 1st July to 30th June.

I would like to confirm that the UNSW has contributed \$30,000 in 2007 and \$125,000 in 2008 and will make the final contribution of \$95,000 in 2009. In other words, the UNSW has contributed a total of \$155,000 during the AAL's financial year 2007/2008.

We have spent \$73,645.49 of the total 07/08 budget as at 30th June 2008. The remainder of these funds will be spent before 31st December 2008.

Yours sincerely,

Stephen Lo
School Manager
School of Physics
S.Lo@UNSW.EDU.AU



Gemini Performance Indicators

Although the following information is for the financial year 2007/08, the observing semesters 07B and 08A on which statistics are based run from Aug 2007 - Jul 2008.

Independence

Throughout the period July 2007 - June 2008 both telescopes have performed extremely reliably, with between 75% and 90% of the nights on each telescope available for science. The remainder is required for maintenance and commissioning of new instruments. Following the accidental overheating of the Gemini Near-infrared Spectrometer instrument in April 2007, work continues on repairing the damaged internal components with a view to recommissioning the instrument on Gemini North in early 2009. The Laser Guide Star facility on Gemini North has proved extremely popular with up to 60 scheduled nights of availability per semester. However limitations imposed by US Space Command and aircraft spotters on where the laser may be safely pointed have made scheduling programs of more than an hour or so in duration very difficult.

The 2007/08 subscription paid by Australia for its 6.19% share of the Gemini partnership was:

ARC	\$803,669	(payment processed by ARC)
ARC	\$948,337	
NCRIS	\$195,717	
MNRF	\$257,482	(payment processed by CSIRO during late 2006/07)
Total	\$2,205,205	

In addition, NCRIS supplied a further \$315,193 as Australia's share of the Aspen instrumentation program and \$150,000 for the costs of operating AusGO for the final six months of 2007/08.

MNRF funding of US\$690K bought Australia 15 nights of access to the Magellan 6.5-m telescopes, half of which was paid in cash and half was paid in-kind of the form of two Magellan Fellows based in Chile to provide observing support and carry out scientific research.

Meeting Researcher Needs / Fostering Collaboration

A total of 43 astronomers from 8 Australian institutions (8 of whom were PhD students) submitted 45 proposals for observing time with Gemini. Collaborators from 59 foreign institutions (listed in Table 1) were involved, and the vast majority of proposals (86%) had investigators from a single Australian institution and one or more foreign institutions. All but one of the remainder had investigators from more than one Australian institution.

Table 1 - List of foreign institutions represented in Australian Gemini proposals

Aarhus University	Queens University Kingston
California Institute of Technology	San Francisco State University
Centre d'Études de Saclay	South African Astronomical Observatory
Columbia University	Tuorla Observatory
Consejo Superior de Investigaciones Cientificas	Universidad de Chile
Cornell University	Universidad de Valencia
Cyprus College	Universidad Nacional de La Plata
European Southern Observatory	University of Arizona
Gemini Observatory	University of Bristol
Herzberg Institute of Astrophysics	University of California Berkeley
Instituto de Astrofísica de Andalucía	University of California Los Angeles
Instituto de Astrofísica de Canarias	University of California Santa Cruz
Johns Hopkins University	University of Cambridge
Laboratoire d'Astrophysique de Marseille	University of Chicago
Las Cumbres Observatory	University of Durham
Liverpool John Moores University	University of Exeter
Max-Planck-Institut fur Astronomie	University of Hawaii
Max-Planck-Institut fur extraterrestrische Physik	University of Heidelberg
McGill University	University of Leiden
Michigan State University	University of Madrid
National Optical Astronomy Observatory	University of Oxford
National Radio Astronomy Observatory	University of Potsdam
Observatoire de Grenoble	University of Strasbourg
Observatories of the Carnegie Institution of Washington	University of Texas
Ohio State University	University of Toronto
Pennsylvania State University	University of Victoria
Pomona College	Uppsala University
Princeton University Queen Mary and Westfield College	Yale University
Queens University Belfast	York University

The oversubscription factor (ratio of hours requested to hours available) for the year as a whole was 230%. In total 35 astronomers from 6 institutions were allocated time on Gemini (or via the exchange program, time on the Subaru or Keck telescopes), 5 of whom were PhD students. Table 2 lists the 21 papers published in the past year that have been based on Gemini data and involving Australians authors (indicated in bold face).

Table 2 - Papers published in the last year that have been based on Gemini data and involve Australian authors (bold face)

Meléndez, J., Asplund, M., Alves-Brito, A., Cunha, K., Barbuy, B., **Bessell, M. S.**, Chiappini, C., **Freeman, K. C.**, Ramírez, I., Smith, V. V., Yong, D. (2008). *Chemical similarities between Galactic bulge and local thick disk red giant stars*, *Astronomy & Astrophysics*, 484, p. L21-L25.

Teodoro, M., Damineli, A., **Sharp, R. G.**, Groh, J. H., Barbosa, C. L. (2008). *Near-infrared integral field spectroscopy of the Homunculus nebula around Eta Carinae using Gemini/CIRPASS*, *Monthly Notices of the Royal Astronomical Society*, 387, p. 564-576.

Wang, Z., Bassa, C., Kaspi, V. M., **Bryant, J. J.**, Morrell, N. (2008). *Optical/Infrared Observations of the Anomalous X-Ray Pulsar 1E 1048.1-5937 During Its 2007 X-Ray Flare*, *Astrophysical Journal*, 679, p. 1443-1446.

Blum, R. D., **McGregor, P. J.** (2008). *The Ionizing Stars of the Galactic Ultra-Compact H II Region G45.45+0.06*, *Astronomical Journal*, 135, p. 1708-1717.

Burleigh, M. R., Clarke, F. J., Hogan, E., Brinkworth, C. S., Bergeron, P., Dufour, P., **Dobbie, P. D.**, Levan, A. J., Hodgkin, S. T., Hoard, D. W., Wachter, S. (2008). *The 'DODO' survey - I. Limits on ultra-cool substellar and planetary-mass companions to van Maanen's star (νMa2)*, *Monthly Notices of the Royal Astronomical Society*, 386, p. L5-L9.

Dey, A., Soifer, B. T., Desai, V., Brand, K., Le Floc'h, E., **Brown, M. J. I.**, Jannuzi, B. T., Armus, L., Bussmann, S., Brodwin, M., Bian, C., Eisenhardt, P., Higdon, S. J., Weedman, D., Willner, S. P. (2008). *A Significant Population of Very Luminous Dust-Obscured Galaxies at Redshift $z \sim 2$* , *Astrophysical Journal*, 677, p. 943-956.

Davidge, T. J., Beck, T. L., **McGregor, P. J.** (2008). *Probing the Central Regions of Nearby Compact Elliptical Galaxies*, *Astrophysical Journal*, 677, p. 238-248.

enko, S. B., Fox, D. B., Penprase, B. E., Cucchiara, A., Price, P. A., Berger, E., Kulkarni, S. R., Harrison, F. A., Gal-Yam, A., Ofek, E. O., Rau, A., Chandra, P., Frail, D. A., Kasliwal, M. M., **Schmidt, B. P.**, Soderberg, A. M., Cameron, P. B., Roth, K. C. (2008). *GRB 070125: The First Long-Duration Gamma-Ray Burst in a Halo Environment*, *Astrophysical Journal*, 677, p. 441-447.

Riffel, R. A., Storchi-Bergmann, T., Winge, C., **McGregor, P. J.**, Beck, T., Schmitt, H. (2008). *Mapping of molecular gas inflow towards the Seyfert nucleus of NGC4051 using Gemini NIFS*, *Monthly Notices of the Royal Astronomical Society*, 385, p. 1129-1142.

Beck, T. L., **McGregor, P. J.**, Takami, M., Pyo, T.-S. (2008). *Spatially Resolved Molecular Hydrogen Emission in the Inner 200 AU Environments of Classical T Tauri Stars*, *Astrophysical Journal*, 676, p. 472-489.

Norris, M. A., Sharples, R. M., **Bridges, T.**, Gebhardt, K., Forbes, D. A., Proctor, R., Raul Faifer, F., Carlos Forte, J., Beasley, M. A., Zepf, S. E., Hanes, D. A. (2008). *Gemini/ GMOS spectroscopy of the spheroid and globular cluster system of NGC 3923*, Monthly Notices of the Royal Astronomical Society, 385, p. 40-52.

Takami, M., Beck, T. L., Pyo, T.-S., **McGregor, P.**, Davis, C. (2007). *A Micro-Molecular Bipolar Outflow from HL Tauri*, Astrophysical Journal Letters, 670, p. L33-L36.

Abraham, R. G., Nair, P., McCarthy, P. J., **Glazebrook, K.**, Mentuch, E., Yan, H., Savaglio, S., Crampton, D., Murowinski, R., Juneau, S., Le Borgne, D., Carlberg, R. G., Jørgensen, I., Roth, K., Chen, H.-W., Marzke, R. O. (2007). *The Gemini Deep Deep Survey. VIII. When Did Early-Type Galaxies Form*, Astrophysical Journal, 669, p. 184-201.

Wood-Vasey, W. M., Miknaitis, G., Stubbs, C. W., Jha, S., Riess, A. G., Garnavich, P. M., Kirshner, R. P., Aguilera, C., Becker, A. C., **Blackman, J. W.**, Blondin, S., Challis, P., Clocchiatti, A., Conley, A., Covarrubias, R., Davis, T. M., Filippenko, A. V., Foley, R. J., Garg, A., Hicken, M., Krisciunas, K., Leibundgut, B., Li, W., Matheson, T., Miceli, A., Narayan, G., Pignata, G., Prieto, J. L., Rest, A., **Salvo, M. E., Schmidt, B. P.**, Smith, R. C., Sollerman, J., Spyromilio, J., Tonry, J. L., Suntzeff, N. B., Zenteno, A. (2007). *Observational Constraints on the Nature of Dark Energy: First Cosmological Results from the ESSENCE Supernova Survey*, Astrophysical Journal, 666, p. 694-715.

Miknaitis, G., Pignata, G., Rest, A., Wood-Vasey, W. M., Blondin, S., Challis, P., Smith, R. C., Stubbs, C. W., Suntzeff, N. B., Foley, R. J., Matheson, T., Tonry, J. L., Aguilera, C., **Blackman, J. W.**, Becker, A. C., Clocchiatti, A., Covarrubias, R., Davis, T. M., Filippenko, A. V., Garg, A., Garnavich, P. M., Hicken, M., Jha, S., Krisciunas, K., Kirshner, R. P., Leibundgut, B., Li, W., Miceli, A., Narayan, G., Prieto, J. L., Riess, A. G., **Salvo, M. E., Schmidt, B. P.**, Sollerman, J., Spyromilio, J., Zenteno, A. (2007). *The ESSENCE Supernova Survey: Survey Optimization, Observations, and Supernova Photometry*, Astrophysical Journal, 666, p. 674-693.

Lodieu, N., Pinfield, D. J., Leggett, S. K., Jameson, R. F., Mortlock, D. J., Warren, S. J., Burningham, B., Lucas, P. W., Chiu, K., Liu, M. C., Venemans, B. P., McMahon, R. G., Allard, F., Baraffe, I., Barrado Y Navascués, D., Carraro, G., Casewell, S. L., Chabrier, G., Chappelle, R. J., Clarke, F., Day-Jones, A. C., Deacon, N. R., **Dobbie, P. D.**, Folkes, S. L., Hambly, N. C., Hewett, P. C., Hodgkin, S. T., Jones, H. R. A., Kendall, T. R., Magazzù, A., Martín, E. L., McCaughrean, M. J., Nakajima, T., Pavlenko, Y., Tamura, M., **Tinney, C. G.**, Zapatero Osorio, M. R. (2007). *Eight new T4.5-T7.5 dwarfs discovered in the UKIDSS Large Area Survey Data Release 1*, Monthly Notices of the Royal Astronomical Society, 379, p. 1423-1430.

Berger, E., Fox, D. B., Price, P. A., Nakar, E., Gal-Yam, A., Holz, D. E., **Schmidt, B. P.**, Cucchiara, A., Cenko, S. B., Kulkarni, S. R., Soderberg, A. M., Frail, D. A., Penprase, B. E., Rau, A., Ofek, E., Bell Burnell, S. J., Cameron, P. B., Cowie, L. L., **Dopita, M. A.**, Hook, I., **Peterson, B. A.**, Podsiadlowski, P., Roth, K. C., Rutledge, R. E., Sheppard, S. S., Songaila, A. (2007). *A New Population of High-Redshift Short-Duration Gamma-Ray Bursts*, Astrophysical Journal, 664, p. 1000-1010.



McCarthy, P. J., Yan, H., Abraham, R. G., Mentuch, E., **Glazebrook, K.**, Yan, L., Chen, H.-W., Persson, S. E., Nair, P., Savaglio, S., Crampton, D., Juneau, S., Le Borgne, D., Carlberg, R. G., Marzke, R. O., Jørgensen, I., Roth, K., Murowinski, R. (2007). *A Compact Cluster of Massive Red Galaxies at a Redshift of 1.*, Astrophysical Journal Letters, 664, p. L17-L21.

Price, P. A., Songaila, A., Cowie, L. L., Bell Burnell, J., Berger, E., Cucchiara, A., Fox, D. B., Hook, I., Kulkarni, S. R., Penprase, B., Roth, K. C., **Schmidt, B.** (2007). *Properties of a Gamma-Ray Burst Host Galaxy at $z \sim$* , Astrophysical Journal Letters, 663, p. L57-L60.

McSaveney, J. A., Wood, P. R., Scholz, M., **Lattanzio, J. C.**, Hinkle, K. H. (2007). *Abundances in intermediate-mass AGB stars undergoing third dredge-up and hot-bottom burning*, Monthly Notices of the Royal Astronomical Society, 378, p. 1089-1100.

Brough, S., Proctor, R., Forbes, D. A., Couch, W. J., Collins, C. A., Burke, D. J., Mann, R. G. (2007). *Spatially resolved kinematics and stellar populations of brightest cluster and group galaxies*, Monthly Notices of the Royal Astronomical Society, 378, p. 1507-1530.

Quality of Research Infrastructure

At the June 2007 Gemini Users meeting, the Associate Director of Science Operations at Gemini, Dr Dennis Crabtree, presented a benchmarking survey of Gemini publications. At that time a total of 360 Gemini papers had been published (the total count has since passed 500). After 5 years of operation, the number of papers per year per Gemini telescope was slightly better than for the Keck and Subaru observatories, and only slightly less than for the VLT and CFHT. The percentage of Australian first-author Gemini publications in that time (5.3%) is consistent with Australia's share of Gemini time (4.76% originally, rising to 6.19% halfway through). The average impact factor per Gemini paper (defined as the number of citations achieved, normalised to the median number of citations for a paper in the Astronomical Journal in that same year) is comparable to that for Keck, greater than for VLT and Subaru, and exceeded only by CFHT. It is worth highlighting that the average impact factor for Australian Gemini publications is 3.7, the highest of any Gemini partner country.

Another important benchmark for Australia's return on its Gemini investment is the fraction of allocated Australian proposals that are executed to completion (>80% of the allocated time observed). Proposals are divided in the following way:

Band 1	Top 30% proposals	Gemini aims to start and then ultimately complete all such programs in the current or following 2 semesters
Band 2	Middle 30% proposals	If the program is able to be started, Gemini aim to complete it
Band 3	Lower 40% proposals	No guarantee is made that the program will be started, let alone completed

Of the 11 Australian proposals in Band 1, only 4 have been completed. Of the remaining 7 programs, 3 are target of opportunity proposals to follow up Gamma Ray Bursts, the triggering of which has not occurred as often as expected; two have rollover status which should see them completed in the coming year; and two have suffered from technical difficulties with the Laser Guide Star system. In Band 2, 60% of proposals are complete but 20% were not started. In Band 3, 2/3 of programs have been started, and 1/3 have been completed. Only 40% of the classically-scheduled programs on Gemini, Keck and Subaru obtained all the data they sought, underscoring the value of Gemini's queue-based observing system.

Collaborative Infrastructure Provision

There were no changes to the Gemini Partnership during 2007/08.

Acronyms used in this report

8m	8-m class visible/infrared telescope such as Gemini
AAAAC	Australian Antarctic Astronomy Advisory Committee
AABoM	Australian Astronomy Board of Management
AAL	Astronomy Australia Limited
AAO	Anglo-Australian Observatory
AAT	Anglo-Australian Telescope
AATB	Anglo-Australian Telescope Board
AGMTAC	Australian Giant Magellan Telescope Advisory Committee
AGMTPO	Australian Giant Magellan Telescope Project Office
AGS	Australian Gemini Scientist
AGSC	Australian Gemini Steering Committee
AGUSS	Australian Gemini Undergraduate Summer Studentships
ANSOC	Australian NCRIS Strategic Options Committee
ANU	Australian National University
ARC	Australian Research Council
ASKAP	Australian Square Kilometre Array Pathfinder
ATNF	Australia Telescope National Facility
AURA	Association of Universities for Research in Astronomy
AusGO	Australian Gemini Office
BETA	Boolardy Engineering Test Array
CFHT	Canada France Hawaii Telescope
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DDP	Design and Development Phase
DGS	Deputy Gemini Scientist
DIISR	Department of Innovation, Industry, Science and Research
GMT	Giant Magellan Telescope
GSAOI	Gemini South Adaptive Optics Imager
HERMES	High Resolution Multi-object Echelle Spectrograph
LIEF	Linkage Infrastructure, Equipment and Facilities
MNRF	Major National Research Facility (Gemini & SKA)
MoU	Memorandum of Understanding
MWA	Murchison Widefield Array
NCRIS	National Collaborative Research Infrastructure Strategy
NIFS	Near-Infrared Integral Field Spectrograph
PAF	Phased Array Feed
PILOT	Pathfinder for International Large Optical Telescope
RSAA	Research School of Astronomy and Astrophysics
SKA	Square Kilometre Array radio telescope
VLT	Very Large Telescope
WF MOS	Wide-Field Multi-Object Spectrograph