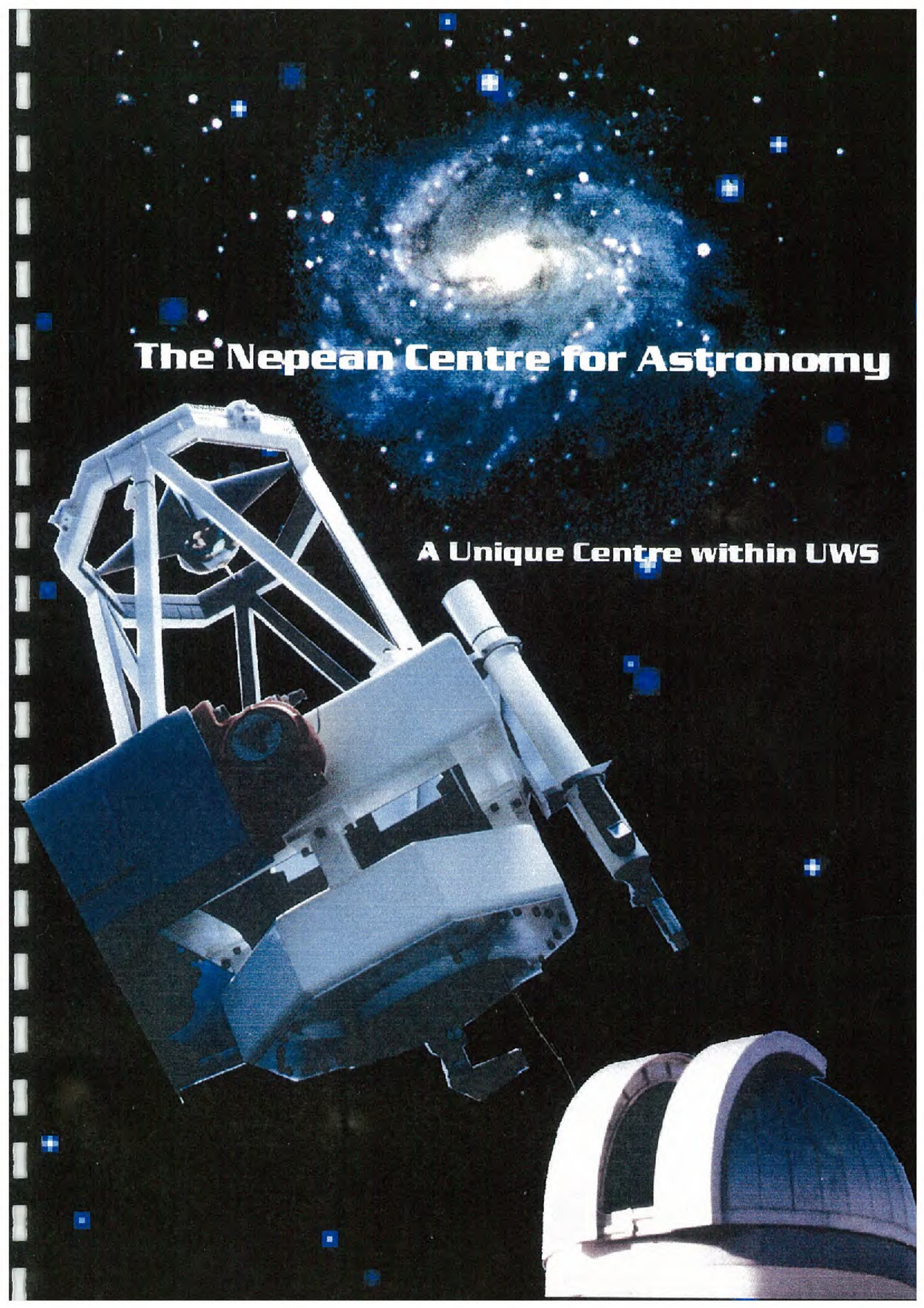


The background of the entire page is a deep space image featuring a bright, glowing spiral galaxy with a yellowish-white core and blue-tinted arms. Scattered throughout the black void are numerous stars, some of which are highlighted with small blue squares. In the lower-left foreground, a large, complex astronomical telescope is shown. It has a white metal framework and a large blue rectangular component. A long, white cylindrical telescope tube extends from the structure towards the upper right. In the bottom right corner, the top of a white, dome-shaped observatory building is visible.

The Nepean Centre for Astronomy

A Unique Centre within UWS

The Nepean Centre for Astronomy

A Unique Centre within UWS

Nepean Centre for Astronomy

The Centre for Astronomy is the only group in physical sciences that has experienced a growth in student numbers over the last two years.

The Centre for Astronomy is a unique experiment of the University/public interface within Australia and possibly the world - the Centre brings together the highest levels of international academic pursuits with an agenda of taking this material to the general public.

The staff of the Centre for Astronomy are highly trained researchers with a strong commitment to science communication and education. The Centre for Astronomy provides astronomy education from the "cradle to the grave". The same Centre that manages international collaborations in astrophysical research also manages a program to teach astronomy to pre-schoolers.

The Centre for Astronomy also runs the Nepean Observatory, which is visited by over 10,000 members of the public annually.

The AIM program has now been put in place; the first Internet astronomy degree in the world, which has a student base of around 60 students.

The Centre presently answers to the Nepean PVC (Research). The objectives of the Centre are the growth and development of the discipline of Astronomy within the University and the community.

Nepean Centre for Astronomy

Head
Associate Professor Graeme L. White - BSc, MSc, PhD, Dip CM, FRAS.

Senior Lecturer
Dr Paul Jones - BSc, PhD, FRAS.

Lecturer
Alex Hons - BSc, MSc, Dip Ed.

Observatory Manager
Maria Hunt - RN, BSc(Hons).

Postdoctoral Fellow
Dr Miroslav Filipovic - BSc, PhD.

Honorary Research Fellow
Dr W. Bruce McAdam - BSc, PhD, FRAS.

Senior Technical Officer
Ken Barridge

Administrative Officer (0.5 time)
Ros McCourt

Bachelor of Astronomy

The only bachelors degree in astronomy in Australia - introduced 1998.

The Bachelor of Astronomy produces graduates with a sound foundation in astronomy and the relevant associated subjects of physics and instrumentation.

Students may also follow a program of elective subjects relevant to areas of interest or anticipated career directions, e.g. research, industry, education or communication.

The B.Astronomy Program

Stage 1

- Foundation Physics 1
- Astronomy 1A
- Foundation Mathematics 1
- One other subject selected from:
 - Foundation Chemistry 1
 - Biology 1A
 - Geology 1

Stage 2

- Foundation Physics 2
- Astronomy 1B: Astronomical Instrumentation
- Foundation Mathematics 2
- One other subject selected from:
 - Foundation Chemistry 2
 - Biology 1B

Stage 3

- Classical Physics
- Modern Physics 1
- Astronomy 2A: Astrophysics of Stars and Planets
- Foundation Mathematics 3

Stage 4

- Optics and Imaging
- Astronautics
- Astronomy 2B: Astrophysics of Galaxies, Quasars and Cosmology
- One other subject

Stage 5

- Electromagnetism
- Astronomy 3A: Astronomy Project 1
- Two other subjects

Stage 6

- Space Sciences
- Astronomy 3B: Astronomy Project 2
- Two other subjects

Bachelor of Astronomy

... astrophysics, astronomical
technology, astronautics and space
science training in the real growth areas
of satellite remote sensing, image
processing and technological development.

Contact UWS Nepean - Freecall 1800 815 434
UAC code 724150, 724155
<http://www.nepean.uws.edu.au/astronomy>
email <a.hons@uws.edu.au>
Nepean Centre for Astronomy (02) 9678 1234



...osz, B. Paynter Layout: C. Bauer

Bachelor of Space Sciences

The first undergraduate degree in this area in Australia - based on the best international practice.

Having explored the Earth, the human species is now on the brink of the next great expansion into space. The early experimental stage of the last 30 years have shown that it can be done... what lies ahead is exploration, commercial exploitation, and the greatest adventure of all.

The year 1996 marked a milestone in the history of space transportation. According to a study led by the accounting firm KPMG Peat Marwick, that was when worldwide commercial revenues in space for the first time surpassed governments' spending on space, totaling some \$77 billion. Growth continues. Some 150 commercial, civil and military payloads were lofted into orbit in 1997, including 75 commercial payloads, a three-fold increase over the number the year before. And the number of payloads reaching orbit in 1998 was set to come close to the 1997 total, according to analyst Johnathan McDowell of Harvard University. Market surveys indicate that commercial launches will multiply for the next several years at least: one estimate holds that 1,200 telecommunications satellites will be completed between 1998 and 2007. In short, a gold rush is now underway that will leave last century's episode in California in dust.

*Tim Beardsley, staff writer, Scientific American,
Scientific American Presents
"The Future of Space Exploration" Quarterly, 1999.*

Similar programs in North America and Europe are in high demand among students, and graduates are in high demand by industry.

The B.Space Sciences Program

Stage 1:

Engineering Mathematics 1
Foundation Physics 1
Introduction to Space Sciences
Astronomy 1A

Stage 2:

Engineering Mathematics 2
Foundation Physics 2
History, Philosophy and Future of the Space Race
Astronomy 1B: Astronomical Instrumentation

Stage 5:

Launch Vehicles and Unmanned Space-craft Principles
Orbits and Transfer Orbits
Remote Sensing Missions (Earth, Planetary and Astronomical)
The Case for the Lunar Base - Third Year Project

Stage 6:

Satellite Communications
Materials Technologies and Micro-gravity Exploitation
Economics and Politics of Space
The Case for Mars - Third Year Project

Stage 3:

Calculus 3
Statistics 1
Astronomy 2A: Astrophysics of Stars and Planets
Digital Imaging Processing Systems
Lunar and Planetary Explorations

Stage 4:

Astronomy 2B: Astrophysics of Galaxies etc
Computer Engineering and Software Principles
Manned Missions and Manned Mission Principles
Exobiology: Terraforming: Life in Space

Stage 7:

Space Physics: Honours Program

Stage 8:

Space Systems: Honours Program

Bachelor of Astronomy

THE SKY IS NOT THE LIMIT...

A degree in astronomy, astrophysics, astronomical instrumentation, cosmology, astronautics and space sciences that will provide training in the real growth areas of physical sciences, satellite remote sensing, image processing and technological development.

Contact UWS Nepean - Freecall 1800 815 974
UAC code 724150, 724155
<http://www.nepean.uws.edu.au/astronomy/courses.html>
email <a.hons@uws.edu.au>
Nepean Centre for Astronomy (02) 9678 7524

Photos: T. Dobosz, B. Paynter Layout: C. Bauer



The Honours Programs

Astronomy Honours Students do very well!

Honours programs are offered for good students.

Honours Graduates:- where are they now?

Maria Hunt	Observatory Manager, Nepean Observatory
	PhD Student UWS
John Kechagias	MSc Student, UWS Nepean
Brett Reynolds.	Private sector, international geophysical exploration
Melissa Hulbert	MSc Student - University of NSW
Sebastian Gurovich	PhD Student - Mount Stromlo Observatory, ANU
Jasmina Lazendic	PhD Student - University of Sydney

Only the best students are accepted ...



The Astronomy Internet Masters (AIM)

AIM is a fee paying on-line course-work masters degree to provide postgraduate training in astronomy for researchers, teachers, science journalists, communicators, and amateur astronomers.

The Master of Astronomy (more well known as the AIM) utilizes the Nepean Observatory and is designed for local, national and international students.

The AIM incorporates the Certificate in Astronomy and the Graduate Diploma in Astronomy. Student feedback is very positive and after only one year we have received over 500 enquiries.

The AIM Degree Program

Stage 1

Fundamentals of Astronomy
Introductory Topics in Science and Mathematics
for Astronomy

Stage 2

Introduction to Astronomy and Astrophysics
Observational Techniques and Instrumentation
in Astronomy

Stage 3

Topics in the History of Astronomy

Stage 4

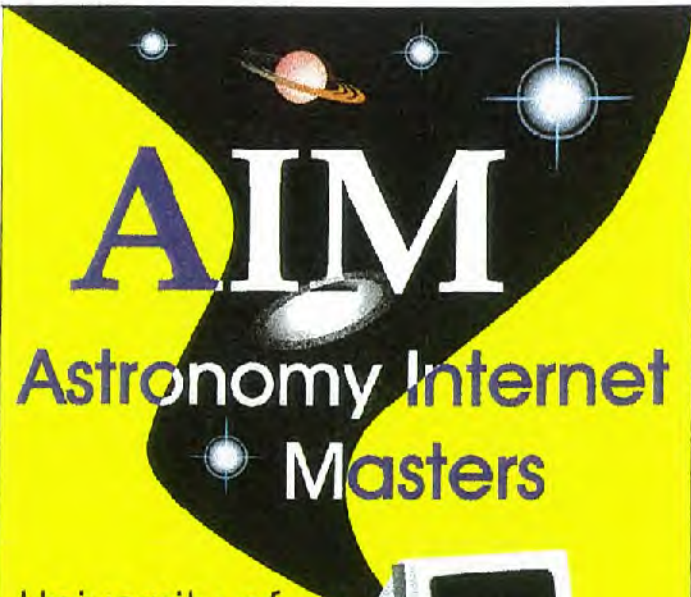
Advanced Astronomical Instrumentation
Topics in Astronomy and Astrophysics

Stage 5

Astronomy Written Project

Stage 6

Astronomy Research Project



AIM
Astronomy Internet Masters

University of
Western Sydney
Nepean



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E-mail: a.hons@uws.edu.au
<http://www.nepean.uws.edu.au/astronomy/>



Research MSc and PhD

World class training open to candidates with first class Honours.

The Centre for Astronomy undertakes research in collaboration with the CSIRO's Australia Telescope National Facility, and has access to a very impressive array of instruments both nationally and internationally.

International collaborations are with:-

Max Planck Institut fur Extraterrestrische Physik
Lawrence Berkeley National Laboratory
Leeward College, University of Hawaii
Max Planck Institut fur Radioastronomie
University of Chicago - Yerkes Observatory
Adler Planetarium
Munich University of Technology

National Collaborations

Australia Telescope National Facility
Monash University

Instruments being used for research:-

Compact Array of the ATNF
The Parkes Radio Telescope of the ATNF
Mopra Radio Telescope of the ATNF
Swedish European Sub-millimeter Telescope (SEST)
The Anglo-Australian Telescope and the UK Schmidt Telescope

Current PhD/MSc Projects:

mm Wave Studies of Giant Southern Molecular Clouds.
Optical Variability of Southern Active Galactic Nuclei

Construction of an Analogue-Digital Speckle Interferometer
Computerization of the Telescope at the Nepean Observatory
Construction of a Research CCD Camera
Construction of a Fibre-fed High Resolution Spectrograph
Construction of a Wide-angle Lensless Wright Camera

Hands-On Universe to Australia
Designing and Implementing an Internet Masters degree in Astronomy

A Study of Dunlop's Catalogues of 1826/8

PhD/MSc Graduates:- where are they?

Christina Bauer	MSc	Nepean Observatory
Miroslav Filipovic	PhD	Max Planck Institute for Extraterrestrische Physik UWS shared Postdoctoral Fellow
Ben Lloyd	PhD	Travelling/ Computer Industry (and "getting a life")
Snezana Stanemirovic	PhD	Cornell University Postdoctoral Fellow

Internet Teaching

The Centre for Astronomy leads the university in internet teaching with its AIM.

The AIM (Astronomy Internet Masters) is a fee paying on-line course postgraduate program designed for students located locally, Australia-wide and world-wide.

The Big Picture will go on-line in 2000 for all of UWS.



The Centre for Astronomy intends to move - with due haste and caution - to a mode of teaching where all programs of the Centre at the Second and Third year level are taught via remote teaching, with special emphasis on the Internet.

Popular Science Electives for Non-science Majors

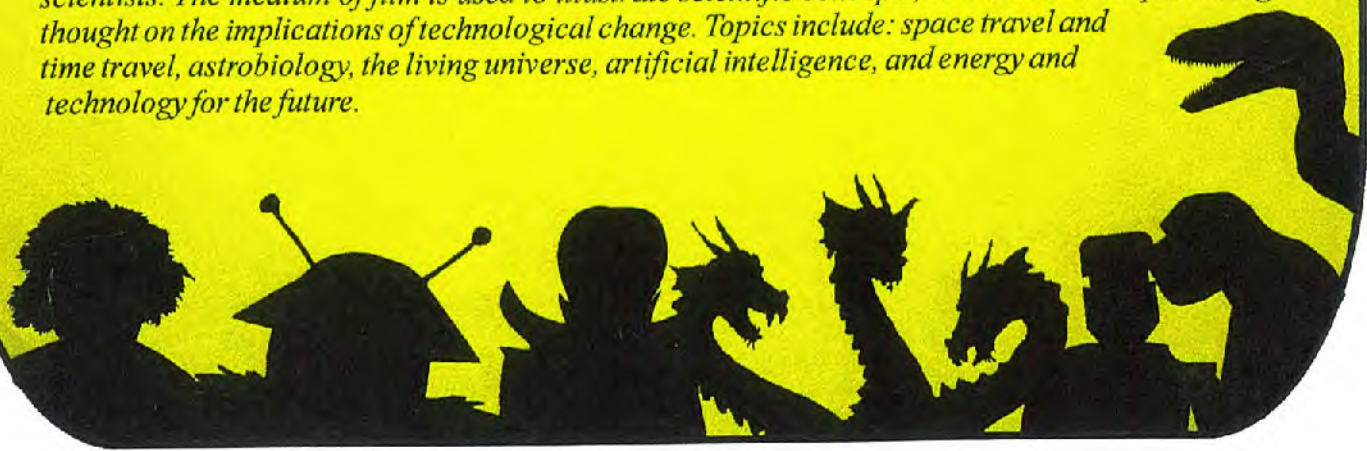
*The most appreciated programs offered within UWS Nepean
(Ref - Nepean SFQ)*

1. Liberal Arts Astronomy...

... is an introduction to the science and philosophy of astronomy. It incorporates an overview of the physical nature of the universe - the planets, stars, and galaxies - and an introduction to the observational aspects of astronomy, including the use of star charts and telescopes. The history of astronomical ideas are critiqued through the philosophy of science from the ancient Babylonians to current cosmology.

2. The Big Picture...

.... communicates scientific concepts and principles in terms that can be easily understood by non-scientists. The medium of film is used to illustrate scientific concepts, at the same time provoking thought on the implications of technological change. Topics include: space travel and time travel, astrobiology, the living universe, artificial intelligence, and energy and technology for the future.



Research

Our latest PhD graduate is working at Cornell University, stationed at Puerto Rico, using the Arecibo Radio Telescope, the largest radio telescope in the World.

Other students regularly use major instruments including the SEST Radio Telescope in Chile.

The Centre for Astronomy has an active research presence at UWS over the last decade.

Radio astronomy research is carried out in collaboration with CSIRO's Australia Telescope National Facility using the Parkes Radio Telescope and the Compact Array.

The facilities at the Nepean Observatory are also used for research in optical astronomy and instrumentation.

Areas of research:-

Radio/Optical Astrophysics

Molecular Astrophysics
Chemistry of the Interstellar Medium
Radio Galaxies
Astrometry
Quasar Variability

Astronomy Education

Internet Teaching

History of Astronomy in Australia

Study of Dunlop's Catalogues of 1826/8

Astronomy Instrumentation

Telescope Control Systems
Speckle Interferometer
Spectroscopy
CCD Camera
Wide-field Camera
Remote Observatories



Research Publications:



Publications - UWS Nepean Astronomy Group (DRG) 1991-1996 Centre for Astronomy 1997+

1991 - Books

Bhattach, R. & White, G.L. 1991 'Under the Southern Cross', Kangaroo Press.

1991 - Refereed Journals

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1991 - Conference abstracts

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International Conferences held at UWS Nepean

1999

In July 1999 the Nepean Centre for Astronomy hosted:

- **the joint Astronomical Society of Australia/Royal Astronomical Society of New Zealand conference**
- **the international “Astronomy Education for the Next Millenium”**
- **the “Global Hands-on Universe” workshop**



9 July – 13 July 1999,
University of Western Sydney Nepean, Sydney, Australia



2nd Joint Meeting of the Astronomical Society of Australia and the Royal Astronomical Society of New Zealand

(to incorporate: Astronomy Education for
the Next Millennium – Astronomy
Education in Schools, Tertiary
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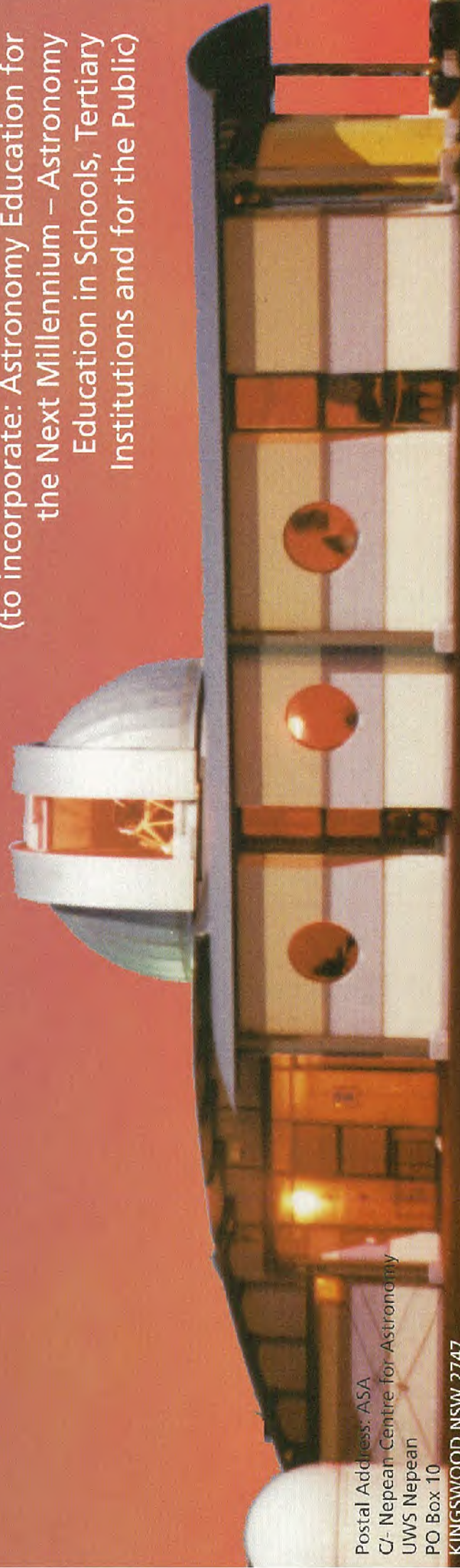
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11 July - 13 July 1999, University of Western Sydney Nepean, Sydney, Australia

ASTRONOMY EDUCATION FOR THE NEXT MILLENNIUM

(to follow the Annual Scientific Meeting
of the Astronomical Society of Australia
and the Royal Astronomical
Society of New Zealand)

Astronomy Education in Schools,
Tertiary Institutions
and for the Public

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Robert Hollow
Maria Hunt
Barrie Jones
Wayne Orchiston
Carl Pennypacker
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GHOU



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Hands-On

Universe

Postal Address: GHOU Meeting

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or: r.hollow@scholar.nepean.uws.edu.au

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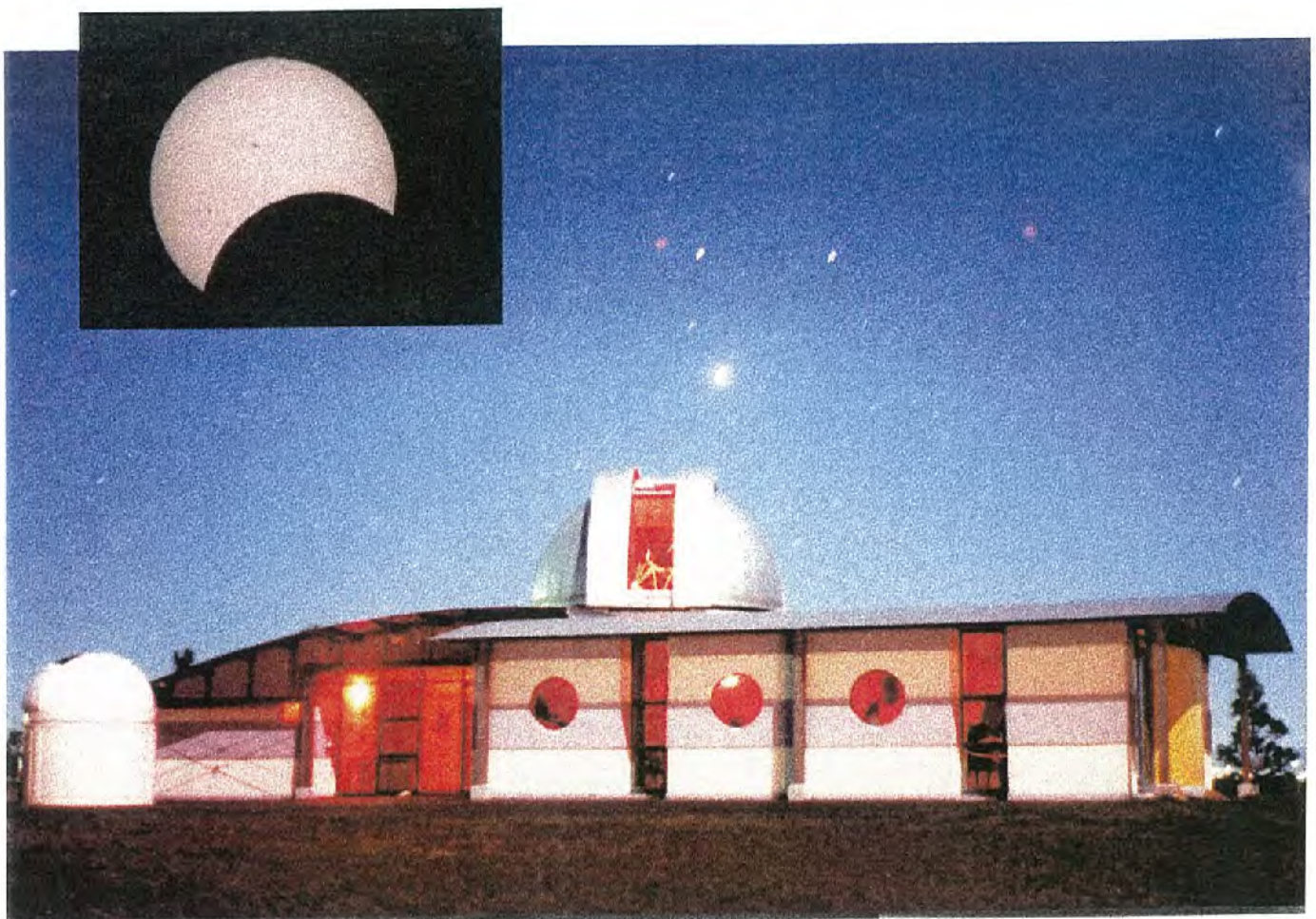


Nepean Observatory

The largest and best on-campus observatory in Australia, and one of the best in the World.

The Nepean Observatory is a public-access and research astronomical observatory located at Werrington North on the Penrith Campus of UWS.

The Nepean Observatory has a 24-inch (0.6-metre) computerised telescope, one of the largest in Australia available for public viewing. The telescope can be used via the Internet for observing sessions for overseas Universities and Educational institutions. Funding for the Internet control system is from the Lawrence Berkeley National Laboratories (USA).



The Observatory runs day and evening programs for primary and high schools, as well as general community programs. Around 500 adults and children participate in Observatory programs each month.

The Observatory operation is approaching cost recovery.

The Nepean Observatory

The Nepean Observatory is part of the Centre for Astronomy. It is open to both the public and to school groups for viewing and activities. We have regular public viewing nights and run both day and evening programs for schools at all levels from Kindergarten to Year 12 (HSC Review Programs).



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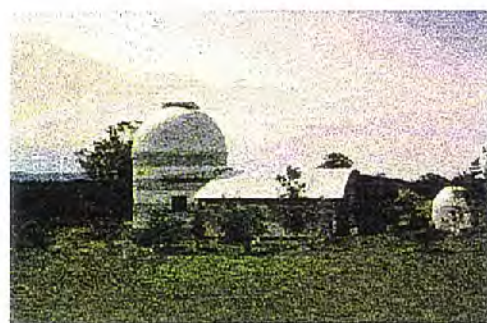
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Centre for Astronomy



The sky is not the limit at UWS Nepean!!

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next millenium with new and exciting degrees
set to take mere earthlings into a realm of
endless possibilities...



Undergraduate Degrees Offered in 2000:

• **Bachelor of Astronomy:**

This degree takes students through an in depth study of astronomy, astrophysics, astronomical instrumentation, cosmology, astronautics and space sciences. Students will complete a 3 year full or six year part time study sequence and may pursue careers in astronomy, astrophysics, other professional sciences, education, scientific communications, computing and remote sensing science.

• **Bachelor of Space Sciences:**

There is no degree of this type in Australia, and UWS Nepean intends to be the first! The aim of this degree is to train students in the science, skills and philosophies of space exploration by providing training in the real growth areas of the physical sciences such as satellite and remote sensing, image processing and technological development. As the space industry is rapidly growing this degree will assist students to meet increasing public demands.

• **Astronomy and Astrophysics Major and Submajor**

Offered in association with the School of Science as part of the Bachelor of Science Degree.

General Elective Subjects for 2000:

• **Liberal Arts Astronomy:**

This subject is an introduction to the science and philosophy of astronomy. The history of astronomical ideas dating back to the Babylonians to current cosmology will be explored and critiqued to gain understanding of the physical nature of the Universe - the planets, stars and galaxies - and also the observational aspect of astronomy, including star charts and telescopes..



Werrington North Campus
University of Western Sydney, Nepean
Great Western Highway, Werrington.

General Elective Subjects for 2000:

• **The Big Picture (Science Through the Media of Science Fiction Movies):**

This subjects communicates scientific concepts through the medium of film, in terms that can be easily understood by non-scientists! This subject aims to provoke thoughts about the implications of technological change and covers topics such as space travel, time travel, astrobiology, the living universe, artificial intelligence, and energy and technology for the future.

• **Cosmos (Theories of Everything):**

You need not be a scientist to do this subject. This subject studies concepts in relativity, quantum mechanics, and cosmology in terms that can be understood without a prerequisite of advanced mathematics, by students who invest an interest in modern physical science.



Last image of the Partial Solar Eclipse on Feb 16 1999
taken at Nepean Observatory before the sun
dropped below the telescope's safety limits.

• **A Certificate of Astronomy Program**
A fully Internet coursework program!!

Post-graduate Degrees:

• **Masters of Astronomy (Astronomy Internet Masters (AIM))**

An international coursework masters program provided totally over the Internet.

• **Research - Masters and Ph.D. programs**
available in Astronomy and Astrophysics.

Enrolment Procedures for Year 2000:

All Undergraduate degrees offered by the University of Western Sydney Nepean Centre for Astronomy may be enrolled through the University Admissions Centre (UAC). The UAC web site is: <http://www.uac.edu.au>

You are most welcome to visit the Centre for Astronomy website on:

<http://www.nepean.uws.edu.au/astronomy>
or the Nepean Observatory at:
<http://www.nepean.uws.edu.au/astronomy/nepobs.html>

School Programs

Nepean Observatory offers both daytime and evening programs for students of all ages from pre-school to Year 12

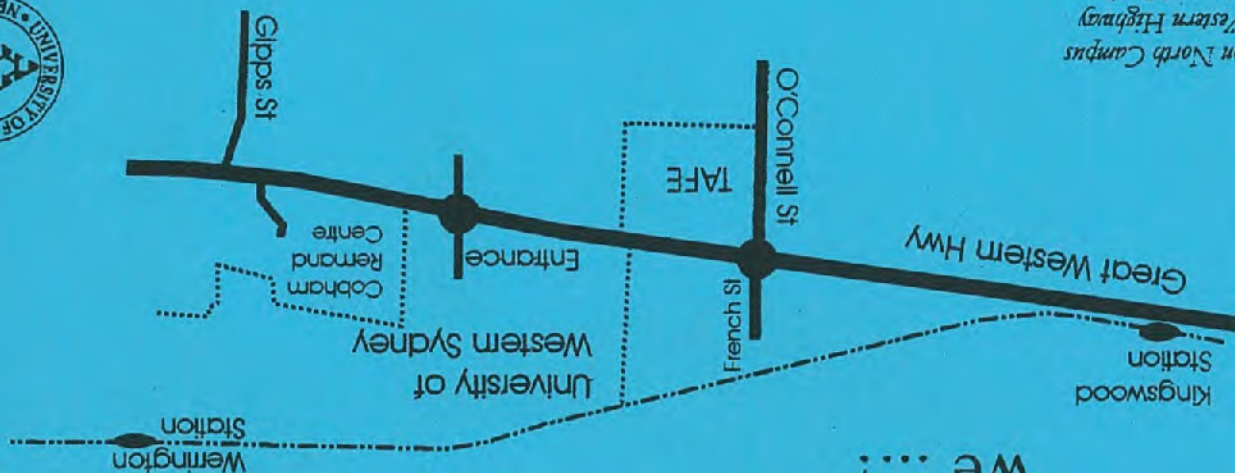
We run a variety of hands-on programs covering astronomy, space and general science as well as offering an innovative range of programs to support humanities and fine arts. Alternatively, we can tailor a program to meet your needs.



We can also bring telescopes/slide shows etc to your school for both day and evening visits. Please contact us for details.

In the months of August and September the Nepean Observatory runs a program for students undertaking the astronomy elective for HSC physics.

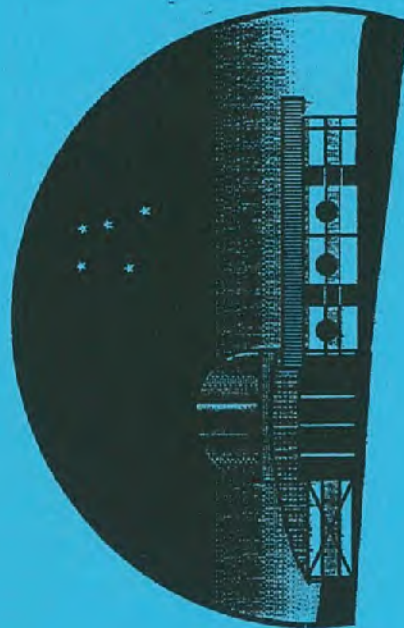
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NEPEAN OBSERVATORY



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...than are dreamt of ...

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Nepean Observatory

Located on the North Werrington campus of the University of Western Sydney, at the foot of the beautiful Blue Mountains, Nepean Observatory is open to the public.

Nepean Observatory boasts a variety of day and evening programs suitable for both school groups of all ages and the general public. We also feature special events such as guest lectures by prominent speakers and Open Days/Evenings to observe particular astronomical phenomena.

Nepean Observatory is a working research observatory, boasting a 0.6m (24") computer controlled telescope that is the largest on-campus telescope in Australia. This telescope, along with several smaller instruments, is available for use by the public during our regular Friday night programs (weather permitting).

SEE THE STARS

Nepean Observatory is open to the public every Friday night from 7 to 9pm (Daylight savings, 7:30-9:30pm). We are also open on other nights for group bookings (min 5 adults).

Evening programs include a talk/slide show on a variety of topics, a tour of the facilities and a chance to use the telescopes (weather permitting). Feel free to call us for a list of the topics that will be presented over the next few weeks.

Entry:

Adult	\$8
Child/Concession	\$4
Family (1 parent with children)	\$12
Family (2 parents with children)	\$18

School Holidays

Don't know what to do with the kids? The Nepean Observatory runs School Holiday Workshops including Water and Cordite Rocket workshops as well as Observatory Open Days and special Junior Stargazing nights. Please contact us for details on upcoming holiday programs, or visit our website on: <http://www.nepean.uws.edu.au/astromy/observatory/holidays.htm>

Adult Ed

Nepean Observatory runs a variety of Adult Education courses, held mainly in the evenings. We are also running a course for the University of the Third Age. For details, contact us or see our website on: <http://www.nepean.uws.edu.au/astromy/observatory/adult-ed/adult-ed.htm>

WSAAG

The last visual discovery of a Supernovae (world-wide) was made by a WSAAG member.

The Western Sydney Amateur Astronomy Group (WSAAG) was formed in 1991 to support the astronomy outreach activities of the Nepean Centre for Astronomy.

WSAAG meets regularly at the Nepean Observatory and is driving activities at the Linden Observatory.

WSAAG has about 80 members - some of whom have international reputations in astronomy for discovery of Supernovae in external galaxies..

Astronomy is not all beer and skittles ...



The Science Experience For Australia's Future

**A Science Centre to promote a technological future
for young Australians in the centre of the Nations
youngest and fastest-growing population.**

**In every way, the future of these children and that
of Australian industry, and our future living
standards, is in our hands now.**



The Nepean Observatory intends to establish a Science Centre on the Werrington North Campus of the University to augment its current public access programs.

There is strong local political and community support for this project.

It is important for the children of western Sydney to be exposed to the potential of science and technology as they will live and work in the world of space-flight, computers, electronics, and high-tech industry in a way that is difficult for us to visualize at the end of the 20th Century.

The Science Experience: Mach-1

**The immediate purpose of the
Science Experience: Mach-1 is to provide the
western Sydney region with a small but easily
accessible science centre.**

The Centre for Astronomy will set up a science centre with voluntary labour and donated materials, and will run a "Science Circus" type programs using casual staff.

Integral Energy have already promised a display and technical help.



The longer term aim is to grow to The Science Experience.

The Science Centre will be located in University premises adjacent to the Observatory in AH or AF building on Werrington North.

A UWS Planetarium

In Australia there is a planetarium in Melbourne, Brisbane, Adelaide, Perth, Launceston, Canberra and Wollongong. But there is none in Sydney!

The Centre for Astronomy proposes to build Sydney's ONLY planetarium. This will be a small venture initially, leading to a major facility, integrated with the Science Experience.

We have the projector (traditionally the most expensive part).

Nepean Observatory's income is limited by the lack of space. An additional 'cloudy night' venue would double the capacity of the Observatory.

A planetarium would be fantastic advertising for the University!



Our Mission...

**... to continue the excellent
programs set into place by the
Nepean Centre for Astronomy.**

