SEPTEMBER 2003

VollieNews

Newsletter of the POVG-The Perth Observatory Volunteers' Group Inc.

HIGHLIGHTS FROM THE PERTH OBSERVATORY REPORT 2002/2003

· New annual visitor attendance record
· Implementation of star viewing for people with disabilities
· Successful total solar eclipse expedition to Ceduna, SA
· Successful production of the annual astronomy almanac for WA

Observatory activities in the past year have remained focussed on its three core functions of education, information and research. Some areas have experienced significant improvement and this will be detailed below, whilst others continue with relatively steady output or an increase in capability.

In 2002/2003 a new visitor attendance record of 9,772 was set. This accomplishment was mainly the result of a record number of 3,827 visitors on our daytime guided tours. Star viewing nights continue to be popular with the public and the yearly attendance totalled 5,653. Observatory visitor's satisfaction remained high as in previous years, with more than 94 per cent both satisfied with their visit, and, with the educational quality of the services in which they participated.

Access to the Perth Observatory Star viewing night programme was expanded to include people with disabilities with the formal dedication and utilisation of specialised equipment acquired by the Perth Observatory Volunteer Group. The equipment consists of a specialised telescope and mount that can be adjusted to the height of the observer, and not vice versa as is the usual practice. Also, specialised video cameras, monitors and control equipment were installed in order to provide an accessible view of celestial objects for people with restricted mobility and sight. The general public can also use this equipment and this serves to integrate people with disabilities into mainstream activities. Furthermore, advice on how to maximise the use of this equipment by people with disabilities was obtained from the relevant authorities such as the Department of Disability Services, the Independent Living Centre and Recnet.

Acquisition of the portable data projector and laptop PC enabled the successful implementation of off-site PC-based astronomy presentations. In 2002/2003 a total of 82 lectures and the like were conducted by Observatory staff to a total audience of 1,990. Star viewing was also provided to rural and metropolitan, schools and communities. All up, more than 2,496 people viewed the stars with Observatory telescopes transported to their locality for one of 23 'astronomy field nights' conducted during the financial year.

Observatory staff and volunteers successfully mounted an expedition to witness the total solar eclipse at Ceduna, SA, on the 4th December 2002. 24 members of the general public who enjoyed the spectacle immensely accompanied them. An Ha ?telescope was acquired and safely provided all expeditioners with a detailed view of the Sun. This instrument is also regularly used to show the Sun to daytime visitors to the Observatory.

Formal education activities provided by the Observatory included a new Honours-level astrophysics course at Curtin University, the continuation of a second-year practical astronomy course at

IN THIS ISSUE:

PERTH OBSERVATORY REPORT 2002/2003 (CONT)

Curtin University, as well as participation in the multi-disciplinary first-year course containing a large component of astronomy at the University of Western Australia. Also, five university students were supervised in their research projects. Two had Summer Studentships, with one involved tracking asteroids and comets, and another worked on modelling the behaviour of pulsars in binary orbits. Another two students researched the properties of asteroids, and another explored upgrading our 16" telescope for scientific observations.

Public awareness of the Observatory also remains high. The Perth Royal Agricultural Show provided a venue to promote the Observatory to the general public. This activity was reasonably successful as over 7,000 Observatory brochures were distributed to the public and several bookings for the eclipse expedition were secured there. In 2002/2003 the number of people who visited, 'phoned for information (9,872), attended talks, or attended an astronomy field night, totalled 26,240 (28,119 in 2001/2002). Observatory staff also informed the public of astronomical events in 62 radio and 5 television interviews, and 69 newspaper articles. A significant fraction of this media interaction concerned the solar eclipse of 4th December 2002.

In 2002 the full responsibility for the production of the annual astronomy almanac for WA was resumed by Perth Observatory. This arrangement has the virtue of being more responsive to the needs of the local users of this resource. The 2003 almanac was the first in the new format and user feedback has been uniformly positive.

The tragic destruction of the Mount Stromlo Observatory, near Canberra, by bushfire was a great blow to Australian astronomy. Like many other organisations, Perth

Observatory organised events to raise funds for the Mt Stromlo disaster relief effort.

Our annual Summer Lecture raised $800 and an astronomy night held in conjunction with Scitech raised over $5,000 for Mt Stromlo Observatory.

Volunteers have again most ably assisted permanent staff in many activities, notably, the Star Viewing Nights, archiving, and at displays. Volunteer assistance totalled 0.83 FTEs in 2002/2003 and continues to make an important contribution to the Observatory output.

Perth Observatory's research has diversified a little over the year with the inclusion of the study of Gamma Ray Burst (GRB) supernovae in the supernova search programme. An ANU PhD student whose work was adversely affected after the destruction of Mt Stromlo Observatory provided the prime motivation to undertake this line of work However, this work is well aligned with the current programme and capitalises on the Observatory's growing expertise in photometry and telescope automation. A substantial effort went into developing software that automatically controls the Perth-Lowell Automatic Telescope (PLAT) in an effort to promptly detect optical counterparts of GRBs (detected by orbiting satellites) in response to email notification from the GRB Notification Centre.

Searching for planetary transits (where a planet blocks out the light of the star it orbits, for a few hours at a time) has been added to the gravitational microlensing technique (where a star's brightness is enhanced by the passage of a faint foreground star in front of it) in the PLANET project. This project's homebase (team coordination and data management) was also hosted by Perth Observatory in August 2002.

Fully unattended operation has become the norm for all observing with the PLAT over the past year, but usually later than around midnight due to the need for manually refocussing the telescope as temperatures fall during the night. This operation also utilises data from the Observatory cloud detector and overall this has resulted in a threefold increase in the number of images collected by the PLAT this year. Development of a new schedular is progressing, and has been run in trial form for approximately 20 nights. It can manage PLANET observing, as well as other tasks like the Supernova Search. While the telescope is running, members of the PLANET group (still awake, in different time zones) can directly alter the object priorities and sample rates in real time, responding to anomalous behaviour in any event. Perth is the only PLANET telescope using any form of automated observing.

Work on variable stars bore fruit with two refereed papers published concerning some of these objects. Comet observations were hampered by a lack of suitable targets but preparation of papers based on earlier observations continued.

In 2002/2003, a total of 402 (278 asteroid and 124 comet) minor body positions were published. Six of these were confirmation observations for a newly discovered Near Earth Object (NEO), and 165 were useful observations of 35 other NEOs necessary to refine their orbits. One paper was published on our unsuccessful attempt to recover a potentially hazardous asteroid, 1999 OX4. Fortunately, this null detection means that it will not have a close encounter with the Earth in 2014. Also, observations progressed in a search for asteroids in the Lagrangian points of the Earth's orbit. The search we have undertaken is the most extensive conducted to date, but no asteroids of this type brighter than V~17.5 were discovered.

All of the above achievements could not have been accomplished without the consistent effort and commitment of all the Observatory staff, both permanent and volunteer.

(Extracted from the forthcoming CALM annual Report)

OBSERVATORY PERFORMANCE MEASURES 2002-03

	Target	Actual	Explanation of significant variation
Tour visitors	8,800	9,772	Greater than expected attendance at daytime guided tours.
Enquiries	19,100	16,468	Given limited staff numbers, this activity decreased as the number of visitors increased.
Refereed scientific papers	5	3	This decrease reflects the inherent fluctuation in the number of papers associated with the ongoing, protracted and complex nature of the research output, the external collaboration required, and the relatively small number of papers involved each year.
QUALITY			
Positive responses to 'quality' measures in customer surveys	99%	98%	
Submitted research papers published in international refereed journals	100%	100%	
TIMELINESS			
Satisfaction of information requests as they occur	95%	98%	
Timely publication of research papers in international refereed journals	100%	100%	
Effective study of astronomical targets of opportunity as they occurereed research paper	57%	91%	This increase reflects the observing assistance provided by summer students.
COST			
Cost per tour visit or	$18.15	$21.90	This increase is mainly due to an increase in the number of daytime guided tours that don't quite recover full cost.
Cost per enquiry	$32.5	$35.72	
Cost of research activities per ref	$85,000	$134,239	This increase reflects the ongoing, protracted and complex nature of the research output, the external collaboration required, and the relatively small number of papers involved each year.
Cost of research activities per 1,000 head of population	$189	$208	

NEMESIS

'An agent of retribution or punishment quotes the MacQuarie dictionary, and the word actually stems from the Greek Goddess of punishment.

In modern astronomical, it is the name given to the hypothesized star that orbits our own Sun. Davis and others (Davis, M., Hutt, P., and Muller, R.A., 1984. Extinction of species by periodic comet showers. Nature, 308:715-717) identified what they interpreted as a periodicity of about 27 Ma in the major extinction events throughout the last 540†Ma of geological history (the time through which diverse life has existed on Earth).

Major extinctions can be, at least partly, related to impacts of large extraterrestrial objects, epitomized by the Chixulub impact at 63 Ma, related to the extinction of the dinosaurs.

The model devised was that another 'sun' orbited our own Sun at a distance of about 3 light years, and has an eccentric orbit. At this distance it would have an orbital period of about 27 Ma. If its orbit was circular, it would remain outside of the Oort cloud of nascent comets that orbit at distances of up to about 2 light years (or about 160†000 AU), and would probably not have any significant effect on the bodies. However, if it has an orbit with an eccentricity of about 0.5, this star would approach to within 1 light year, and that would bring it to well within the Oort cloud.

Any smallish star, passing within the Oort cloud would have a major effect on the orbits of many of the ìcometsî, throwing them out of stable orbits and sending them in all directions. They would be sent both outwards, ejecting them from our solar system (if you can include the Oort cloud as part of the System) and inwards, sending them towards the parent Sun. It is these latter incoming comets that, if they then attained earth-crossing paths, could collide with the Earth. That is the reason why Davis used the name Nemesis for this hypothesized star.

What can be observed to support this theory? Nothing as yet. Even the periodicity identified by Davis is subject o criticism from other scientists, because there are other major extinction events in the palaeontological record that do not correlate with the 27†Ma. However, there are other events that are known to cause extinctions. For example, a major extinction at the end of Permian time, about 180 million years ago (and, for your edification, the Collie coals that provide us with about 30% of our electricity were formed during Permian times) is correlated with the extrusion of thousands of cubic kilometres of basalt lavas in Russia that produced enough carbon dioxide and sulphur dioxide to make the atmosphere and hydrosphere toxic to life. So, to arrive at this periodicity requires selection of some only of all the identified extinctions.

Should we expect to observe the orbiting star through Earth-bound telescopes? Possibly. However, if it was a red dwarf with a low illumination level, such a star may easily be missed, particularly if it was in a densely populated part of the sky. It might even be concealed behind a dust cloud on the outer edges of our solar system.

A major ESA astronomical satellite, Hipparcos was designed to plot the locations of stars, commencing in 1989, and monitor their relative motions over a period of years. However, its launch vehicle failed to function properly and when it completed its life, Hipparcos had only observed about 25% of the sky, and therefore was not able to provide clear evidence for or against such a star. Current planning revolves around future satellites with greater observing power and resolution, being able to identify stars such as small red dwarfs down to 10th magnitude. In the meantime, more analysis of extinction events, better identification of impact-related extinctions and work on trying to identify comet showers is being tackled. The big question they are all leading to is can we expect another major extraterrestrial impact that could spell disaster for humans.
Mike Freeman

2003/2004 TRAINING NIGHTS SCHEDULE

2003	2004
May 26	Jan 19
Jun 30	Feb 23
Jul 28	Mar 15
Aug 25	Apr 19
Sep 22	May 17
Oct 20	Jun 14
Nov 24	Jul 12
	Aug 9

Training is important for our volunteers, they enjoy it and we need to support these staff members in return for the assistance they render.

Generally, these training nights are scheduled for 7pm the Monday after the week of Last Quarter.

This list is also displayed on the volunteer noticeboard.

Your cooperation is appreciated. Jamie Biggs. Govt Astronomer

MARS - FACT SHEET

Mars is dry as a desert, despite clear evidence that water once flowed freely across its surface.Where did Mars' water go?

Mars, the Red Planet, has inspired wild flights of imagination over the centuries, and intense scientific interest. Fancied to be the source of hostile invaders of Earth, the home of a dying civilization, and a rough-and-tumble mining colony of the future, Mars has proved to be fertile ground for science fiction writers, based on seeds planted by centuries of scientific observation. Mars has shown itself to be the most Earth-like of all the planets; it has polar ice caps that grow and recede with the change of seasons, and markings that appear to be similar to water channels on Earth.

We know that Mars is a small rocky body once thought to be very Earth-like. Like the other "terrestrial" planets - Mercury, Venus, and Earth - its surface has been changed by volcanism, impacts from other bodies, movements of its crust, and atmospheric effects such as dust storms. It has polar ice caps that grow and recede with the change of seasons; areas of layered soils near the Martian poles suggest that the planet's climate has changed more than once, perhaps caused by a regular change in the planet's orbit. Martian tectonism - the formation and change of a planet's crust - differs from Earth's. Where Earth tectonics involve sliding plates that grind against each other or spread apart in the seafloors, Martian tectonics seem to be vertical, with hot lava pushing upwards through the crust to the surface. Periodically, great dust-storms engulf the entire planet. The effects of these storms are dramatic, including giant dunes, wind streaks, and wind-carved features.

Scientists believe that 3.5 billion years ago, Mars experienced the largest known floods in the solar system. This water may even have pooled into lakes or shallow oceans. But where did the ancient flood water come from, how long did it last, and where did it go?

In May 2002, scientists announced the discovery of a key piece in the puzzle: the Mars Odyssey spacecraft had detected larged quantities of water ice close to the surface - enough to fill Lake Michigan twice over. The ice is mixed into the soil only a meter (about 3 feet) below the surface of a wide area near the Martian south pole.

Many questions remain. At present, Mars is too cold and its atmosphere is too thin to allow liquid water to exist at the surface forlong. More water exists frozen in the polar ice caps, and enough water exists to form ice clouds, but the quantity of water required to carve Mars' great channels and flood plains is not evident on - or near - the surface today. Images from NASA's Mars Global Surveyor spacecraft suggest that underground reserves of water may break through the surface as springs. The answers may lie deep beneath Mars' red soil.

Unraveling the story of water on Mars is important to unlocking its past climate history, which will help us understand the evolution of all planets, including our own. Water is also believed to be a central ingredient for the initiation of life; the evidence of past or present water on Mars is expected to hold clues about past or present life on Mars, as well as the potential for life elsewhere in the universe. And, before humans can safely go to Mars, we need to know much more about the planet's environment, including the availability of resources such as water.

Mars has some remarkable geological characteristics, including the largest volcanic mountain in the solar system, Olympus Mons (27 km high and 600 km across); volcanoes in the northern Tharsis region that are so huge they deform the planet's roundness; and a gigantic equatorial rift valley, the Valles Marineris. This canyon system stretches a distance equivalent to the distance from New York to Los Angeles; Arizona's Grand Canyon could easily fit into one of the side canyons of this great chasm.

Mars also has two small moons, Phobos and Deimos. Although no one knows how they formed, they may be asteroids snared by Mars' gravity.

http://sse.jpl.nasa.gov/features/planets/mars/mars.html

Distance from the Sun (Semimajor axis of orbit)	227,936,640 km 1.52366231 A.U.
Mean Equatorial Radius	3,397 km (0.5326 of Earth's radius)
Volume (Earth = 1)	0.149
Mass:	0.64191 x 1027 kg
Density	3.94 gm/cm3
Surface Gravity:	371 cm/s2
Escape Velocity	5.02 km/s
Sidereal Rotation Period (Earth days):	1.02595675
Sidereal Orbit Period (Earth years)	1.88071105
Mean Orbit Velocity	24.1309 km/s
Orbit Eccentricity	0.09341233
Orbit Inclination to Ecliptic	1.85061 degrees
Inclination of Equator to Orbit	25.19 degrees
Mean Temperature at Solid Surface	186 to 268 K
Major Atmospheric Constituents	1CO2, N2, Ar

http://www.astronomy-info.com/SolSys/Mars.html

NASA SEEKS PUBLIC SUGGESTIONS FOR MARS PHOTOS

Earth comes closer to Mars this month than it has in nearly 60,000 years, but one new opportunity for seeing details on the red planet comes from a vantage point much closer.

The public has an unprecedented opportunity to suggest places on Mars that should be photographed from a spacecraft orbiting that planet. Camera operators for NASA's Mars Global Surveyor spacecraft are ready to take suggestions online for new places for images from the Mars Orbiter Camera.

The spacecraft, managed by NASA's (JPL), Pasadena, Calif., has been orbiting Mars since 1997, with more than 20,000 orbits so far. The Mars Orbiter Camera has already taken more than 120,000 pictures of Mars. Many of the camera's images have sharp enough resolution to show features as small as a school bus. The images have revealed relatively recent gully erosion, ancient sedimentary rocks and many other spectacular scientific surprises.

"We've only covered about three percent of the surface area of Mars with the high-resolution camera. We want to be sure we're not missing some place that could be important, so we're casting a wide net for new suggestions," said Dr. Ken Edgett, staff scientist at Malin Space Science Systems, the San Diego firm that supplied and operates the camera for NASA. "We're looking for excellent suggestions of areas on Mars that we have not already imaged," Edgett said. "We'll look at every request that comes in."

"NASA's Mars Global Surveyor spacecraft team will examine each request to ensure the safety of this priceless 'eye in the sky' above Mars," said Dr. Jim Garvin, NASA's Lead Scientist for Mars Exploration at NASA Headquarters, Washington.

Information about how to submit requests is online at the new Mars Orbiter Camera Target Request Site, at:
http://www.msss.com/plan/intro

Requesters should describe the purpose for the suggested image. Suggestions for target sites already imaged by the camera will be disqualified unless there is a convincing reason for repeating the target. An online gallery of pictures taken by the camera is at:
http://www.msss.com/moc_gallery/

"Some of the best requests may be places nowhere near any site the Mars Orbiter Camera has imaged before," Edgett said. As with pictures desired by Mars scientists working with the camera every day, new suggestions will need to wait until the Mars Global Surveyor flies directly over the selected target, which could be several months or longer. The first images from this public suggestion program will probably be released this fall.

NASA NEWS RELEASE Posted: August 20, 2003
http://spaceflightnow.com/news/n0308/20marssuggest/

HUBBLE HAS VIEWING PLANS FOR 'CLOSE ENCOUNTER' WITH MARS

NASA's Hubble Space Telescope (HST) will make observations of the planet Mars on Aug. 26-27. As soon as Hubble's high-resolution images of the Red Planet are received at the Space Telescope Science Institute (STScI) and are digitally processed by the Mars observing team, they will be released to the public and news media via the Internet.

High-resolution files for downloading will available on HubbleSite News Center at **http://hubblesite.org/newscenter/2003/22,** beginning at 6 a.m. EDT Aug. 27.

The Hubble images will be the sharpest views of Mars ever taken from Earth. They will reveal surface details as small as 17 miles (24 km) across. Though NASA's Mars-orbiting spacecraft can photograph the Red Planet in much finer detail, Hubble routinely serves as a "weather satellite" for tracking atmospheric changes on Mars and for probing its geology on a global scale. Unlike "real-time" viewing through ground-based telescopes, Hubble observations are carried out automatically by the orbiting observatory. Free of clouds and atmospheric distortion, Hubble is guaranteed a front-row seat to the celestial close encounter. The images will be stored in an onboard computer, transmitted to the Goddard Space Flight Center in Greenbelt, Md., and then to the Space Telescope Science Institute. Once received at STScI, the images will be calibrated and combined to make a natural, full-color view of Mars. A key image-processing step will be to combine and register images taken through different filters. Because Mars rotates a little between each Hubble exposure, each separate picture must be precisely aligned to make a color image. This means several hours will elapse from the time of a Hubble observation to the assembly of a full-color image.

Two close-approach images will be posted on the Internet on Aug. 27. The first view, taken the evening of Aug. 26, when Mars is 34,648,840 miles (55,760,220 km) from Earth, will be posted as a full-resolution color image for downloading after approximately 6 a.m. EDT.

In the second image, taken within an hour of "closest approach," Mars will be merely 1,400 miles closer than the previous exposure. It will be at its closest distance of 34,647,420 miles (55,757,930 km). The resolution will effectively be the same as in the earlier image.

The image-processed color pictures will be posted on the Internet after 4 p.m. EDT Aug. 27. Mars researchers Jim Bell of Cornell University in Ithaca, N.Y., and Michael Wolff of the Space Science Institute in Boulder, Colo., will be at STScI and available for media interviews beginning at 5 a.m. EDT Aug. 27.

SPACE TELESCOPE SCIENCE INSTITUTE NEWS RELEASE Posted: August 20, 2003
http://spaceflightnow.com/news/n0308/20marshubble/

SKY EVENTS FOR SEPTEMBER

1 Moon at perigee, its closest to the Earth for the Lunar month, 367928 km, (August 31, 18 hrs UT).
3 Half lit Moon about 3.5° below 1st magnitude star Antares.
4 Moon at first quarter 12:34 am NZST (Nov 3, 12:34 UT).
8 - 10 Moon passes Mars (evening sky). 9/10
Mars about 1.5° from 98% lit Moon at midnight NZ.
11 Full Moon at 4:36 am NZST (Sep 10, 16:36 UT).
Mercury at inferior conjunction.
12 Ceres passes Saturn, less than 1° apart at closest.
16 Moon at apogee, its greatest distance from the Earth for the Lunar month, 404713 km.
Asteroid 2000 GF2 near-Earth flyby (0.012 AU).
19 Moon at last quarter 7:03 am NZST (Sep 18, 19:03 UT).
Mercury stationary.
20 - 22 The Moon passes Saturn, and the stars Castor and Pollux (the brightest stars in the constellation Gemini The Twins) (morning sky).
22 The Galileo spacecraft will impact Jupiter's cloud top rather than risking contamination of Jupiter's Moon Europa.
23 SPRING EQUINOX* at 11 pm NZST (11 hours UT). Sun crosses equator moving south.
26 New Moon at 3:09 pm NZST (03:09 UT).
27 Mercury at greatest elongation, 18° west of Sun.
28 Moon at perigee, its closest to the Earth for the Lunar month, 362837 km. Second perigee for NZ this month.
30 Mars stationary.

http://www.rasnz.org.nz/SolarSys/Sep_03.htm and http://www.ozskywatch.com/amaz/space/skyevent/2003/summary.html#anchor489409

SEPTEMBER 23 - SPRING EQUINOX

* EQUINOX
Two times of the year when night and day are about the same length. The Sun is crossing the Equator (an imaginary line around the middle of the Earth) and it is an equal distance from the North Pole and the South Pole.

SPRING EQUINOX:
The first day of the Season of Spring - and the beginning of a long period of sunlight at the Pole. In the northern hemisphere: MARCH 20 (the Sun crosses the Equator moving northward). In the southern hemisphere: SEPTEMBER 22 (the Sun crosses the Equator moving southward).

http://www.athropolis.com/sunrise/def-sol2.htm

PHASES OF THE MOON FOR 2003 (WA TIME)

New Moon		First Quarter		Full Moon		Last Quarter	
Jan 3	04:23	Jan 10	21:15	Jan 18	18:47	Jan 25	16:33
Feb 11	08:48	Feb 9	19:11	Feb 17	07:51	Feb 24	00:46
Mar 31	00:35	Mar 11	15:15	Mar 18	18:34	Mar 25	09:51
Apr 2	03:18	Apr 10	07:40	Apr 17	03:35	Apr 23	20:18
May 01	20:15	May 09	19:53	May 16	11:36	May 23	08:30
May 31	12:20	Jun 08	04:27	Jun 14	19:16	Jun 21	22:45
Jun 30	02:38	Jul 07	10:32	Jul 14	03:21	Jul 21	15:01
Jul 29	14:53	Aug 05	15:27	Aug 12	12:48	Aug 20	08:48
Aug 28	01:26	**Sep 03**	**20:34**	**Sep 11**	**00:36**	**Sep 19**	**03:03**
Sep 26	**11:09**	Oct 03	03:09	Oct 10	15:27	Oct 18	20:31
Oct 25	20:50	Nov 01	12:25	Nov 09	09:13	Nov 17	12:15
Nov 24	06:59	Dec 01	01:16	Dec 09	04:37	Dec 17	01:42
Dec 23	17:43	Dec 30	18:03				

http://www.wa.gov.au/perthobs/hpc5mn03.htm

A VERY HAPPY BIRTHDAY TO VOLLIES & STAFF FOR SEPTEMBER

Trevor Dunn
David Emich
Keith Ford
Mike Freeman
James Healy
Bert Hollebon
Val Semmler
Sheryle Smith
Arie Verveer

POVG
Perth Observatory Volunteers Group

PERTH OBSERVATORY
337 Walnut Road, Bickley WA 6076
http://www.wa.gov.au/perthobs

PERTH OBSERVATORY VOLUNTEERS GROUP INC.

VOLUNTEER MEMBER LIST

Jeff Alcroft
Dick Alderson
Jeanne Bell
Trevor Beardsmore
Lyall Bell
Frank Bilki
Tony Beston
Ric Boelen
Eve Cowlishaw
Giuseppe Coletti
Peter Crake,
Trevor Dunn
David Emich
Keith Ford
Marcel Fortsch
Mike Freeman
Lynda Frewer
Bevan Harris
Don Hartley
Mark Haslam
James Healy
Bert Hollebon
Karen Kotze
Erin Lalor
Vic Levis
Rob Loney
Andrew MacNaughtan
Len Martin
Jacquie Milner
John Morris
Kylie Ralph
Lloyd Robinson
Sascha Schediwy
Val Semmler
Vera Smith
Robert Taylor,
Patricia Turner
Elaine Walker
Sandra Walker
Matthew Zengerer

PERTH OBSERVATORY STAFF

Dr Jamie Biggs	Director and Govt Astronomer
Peter Birch	Astronomer
Ralph Martin	Astronomer
Dr Andrew Williams	Astronomer
Tom Smith	Astronomer Assistant
Greg Lowe	Astronomer Assistant
Janet Bell	Administration Officer
Di Johns	Clerical Officer
Arie Verveer	Technical manager
John Pearce	Mechanical technician
David Tiggerdine	Maintenance Person
Sheryle Smith	Cleaner

POVG VOLUNTEERS

Trevor Dunn	POVG Inc, Chairperson
Karen Koltze	POVG Inc, Vice Chair
Bob Taylor	POVG Inc, Secretary
Bevan Harris	POVG Inc, Treasurer and newsgroup moderator (contact bevan on ngc2070@bigpond.com)

HAVE YOU JOINED THE VOLLIE NEWSGROUP YET?

If you've got any news, information or pic simply post them on the newsgroup for all (newsgroup members only) to enjoy or respond to.
To join simply send your email address to BEVAN HARRIS at:
ngc2070@bigpond.com

To unsubscribe send an email to:
perthobsvollies-unsubscribe@yahoogroups.com.au

To modify your subscription, visit the group website at:
http//au.groups.yahoo.com/mygroups

POVG MEETING - MINUTES

Minutes of Meeting July 28th
Meeting Commenced at 7pm

Attendance.

J.Alcroft. T.Smith. V.Smith.
B.Hollebon. K.Kotze.
S.SchediwyG.Lowe. K.Ford.
D.Alderson. G.Coletti.
M.Zengerer. E.Walker.
A.Williams. P.Birch. J.Morris

Apologies.

T.Dunn. L.Bell. J.Bell. B.Harris.
T.Beardsmore. L.Frewer.
D.Hartley. M.Haslam. L.Martin.
T.Turner. M.Freeman.

Minutes of the Previous Meeting.

Agreed as a true and correct record on the motion of J.Alcroft
Seconded by J.Milner.

Treasurers Report.

In the absence of the Treasurer G.Lowe reported that Funds now stood at G.S.T payments refunded $86.00 bringing the Bank Balance to $204.00. B.A.S claim has been submitted for $8.00

General Business.

There being no items of General Business to be Discussed the Meeting closed at 7.15pm

POVG
Perth Observatory Volunteers Group

PERTH OBSERVATORY
337 Walnut Road, Bickley WA 6076
http://www.wa.gov.au/perthobs