



# vollieNews

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

JULY 2003

## SONGS OF THE STARS - THE REAL MUSIC OF THE SPHERES

The ancient Greeks believed that the planets and stars were imbedded in crystal spheres that hummed as they spun around the heavens, making the "music of the spheres." Pythagoras thought that the orbits of the planets have harmonic relationships.

Johannes Kepler centuries later was so enamoured with Pythagoras' idea that in the early 1600s he spent years trying to discover harmonic relationships among the periods of the planets in their orbits, but ended up proving otherwise.

For nearly 400 years the idea of the music of the spheres languished. But in the 1970s scientists began discovering the sun and other stars actually sing, ringing from sound waves in them that cause them to vibrate, get hotter and cooler, brighter and dimmer, bigger and smaller and change shape. These sound waves cannot get out of the star into the vacuum of space, so we do not "hear" them directly. But scientists can detect that the sounds are there.

Using what is now known as asteroseismology - the seismology of the stars - scientists can "look" beneath the surfaces of the stars right into the utterly unearthly maelstrom of the giant nuclear reactors that make up their cores.

Kurtz's lecture will introduce sound and the physics of musical instruments, and show the seismology of the stars (including an amazing group of the strangest stars in the sky discovered by the lecturer).

Guests also will discover how some singing stars, the Cepheids, helped Edwin Hubble discover the expansion of the universe; they will hear about the possibility of giant "diamonds" the size of the Earth, and they have the chance to hear the stars with their very low frequency sounds shifted up into the audible range.

Professor Don Kurtz was born and raised in San Diego, California and received his PhD in astronomy from the University of Texas. He worked for 24 years in South Africa where he was professor of astronomy at the University of Cape Town. He is now professor in the Centre for Astrophysics of the University of Central Lancashire. He has observed over 1500 nights at observatories all over the world, discovered the entire class of pulsating stars known as the rapidly oscillating peculiar A stars, and has well over 200 professional publications.

He is visiting Perth to lecture on his way to New Zealand for the

International Astronomical Union Colloquium 193 on stellar pulsation for which he is the co-chair of the scientific organising committee, and then on the International Astronomical Union General Assembly in Sydney where he is keynote speaker at Joint Discussion 12 on Solar and Solar-like Oscillations.

He is past president of the International Astronomical Union Commission 27 on Variable Stars. He enjoys public speaking and has decades of experience lecturing all over the world - on cruise ships, at planetariums, in game reserves in Africa, to business people, as an after-dinner speaker, to schools, in fact, to everyone interested in the wonder of astronomy.

Perth Obs vollies get free entry, but PLEASE BOOK A TICKET.

VENUE: Elizabeth Jolley Lecture Theatre, Curtin Uni (enter the Uni from the SW side)

DATE: Wednesday 2 July 2003

TIME: 7:30pm

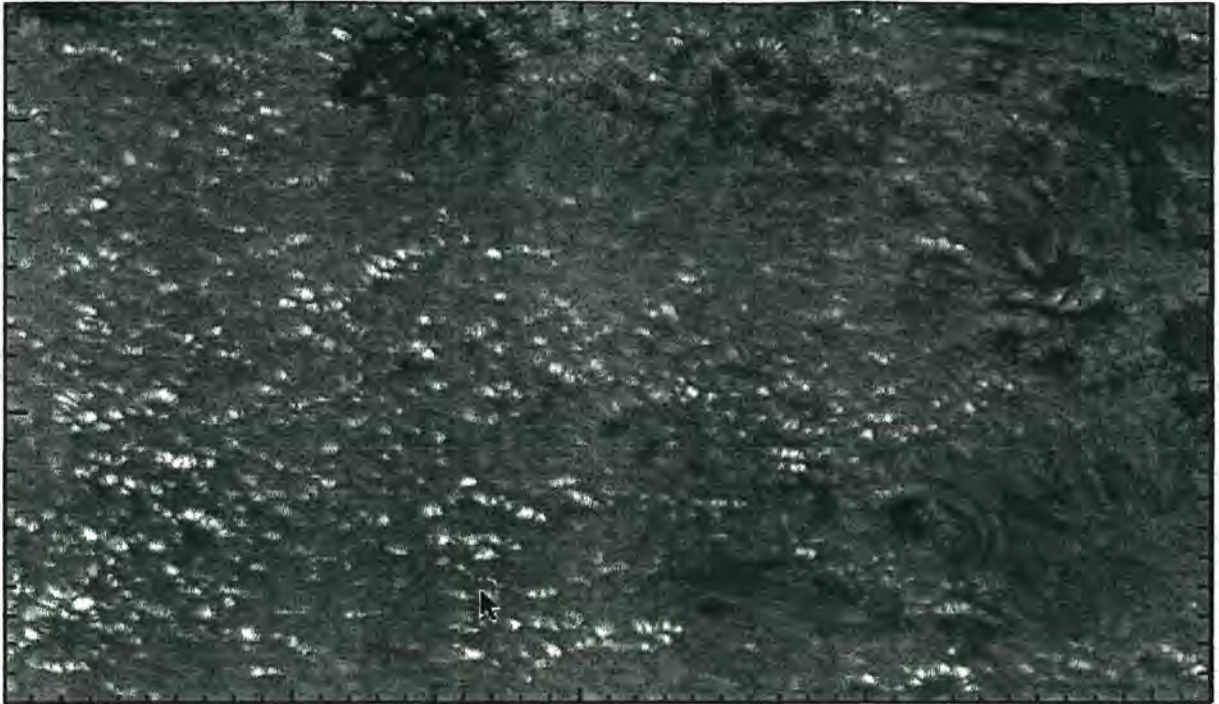
COST: \$5 (call Perth Observatory to book tickets)

— Dr James Biggs

### IN THIS ISSUE:

- ◆ SONGS OF THE STARS ◆ POVG MINUTES ◆ UPCOMING ASTRO EVENTS FOR JULY
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- ◆ ABORIGINAL CONSTELLATION OF THE MONTH
- ◆ FLAT STAR FOUND THE ◆ LIGHTER SIDE OF SPACE

## NEW 3-D PICTURES OF THE SUN



New 3-D images of the Sun billed as the most detailed ever reveal a striking variety of features, astronomers announced today.

The trick in getting the 3-D pictures was to look not at the Sun's central regions but to peer toward the edge, or limb, of the Sun's disk. The effect is similar to staring down at a crowded sidewalk from above and seeing only heads, then looking toward the end of the block and, with a new perspective, being able to see entire bodies.

The images may help theorists understand why the Sun's radiation increases when the star is covered in dark sunspots.

"Until recently we thought of the solar photosphere as the relatively flat and featureless 'surface' of the Sun, punctuated only by an occasional sunspot," said Tom Berger, a solar physicist at the Lockheed Martin Solar and Astrophysics Lab. "Now ... we have, for the first time, imaged the three-dimensional structure of the convective 'granules' that cover the photosphere."

The images were generated by the Swedish 1-meter (3-foot) Solar Telescope on the Spanish island of La Palma. Berger led a study that

was presented today at the American Astronomical Society's Solar Physics Division meeting in Laurel, Maryland.

The solar surface consists mostly of an irregular cellular pattern caused by temperature variations. The cells, called granules, are evidence of convection that transports heat to the surface — just like boiling water on a stove. Each granule on the Sun is about the size of Texas.

In the new images, sunspots and smaller dark "pores" are seen to be sunken into the surrounding granulation. The features had been inferred but never imaged directly. Granulation in regions of smaller magnetic fields outside of sunspots is both raised up and has brighter walls than the granulation in non-magnetic regions. Bright structures near the limb of the Sun have been seen for centuries and are called faculae. Scientists think faculae brightness fluctuations correspond to increased solar radiation during periods of maximum solar magnetic activity.

At solar maximum — the peak of an 11-year cycle — the Sun has more sunspots, which tend to be dark. It might seem logical that less radiation would reach Earth.

Instead, radiation increases.

Scientists suspect the bright faculae near the limb of the Sun to be the source. Models suggest that small magnetic micropores act as tiny holes in the surface of the photosphere.

Figuring this out requires looking at the limb, or edge of the Sun. When looking at center of the Sun's disk, astronomers see only the relatively cool "floors" of the micropores. When seen at an angle near the limb, the models predict that the "hot walls" of the magnetic holes should shine brightly compared to the relatively cooler surrounding granules. The new observations confirmed this.

Most of the bright structures seen are between 93 and 249 miles (150 and 400 kilometers) tall. Simultaneous measurements of the magnetic field establish that the bright faculae are exactly aligned with the magnetic fields, researchers said.

[http://www.space.com/scienceastronomy/3d\\_sun\\_030618.html](http://www.space.com/scienceastronomy/3d_sun_030618.html)

## MARS ORBITER EYES PHOBOS OVER PLANET'S HORIZON

Images from the Mars Orbiter Camera aboard NASA's Mars Global Surveyor capture a faint yet distinct glimpse of the elusive Phobos, the larger and innermost of Mars' two moons. The moon, which usually rises in the west and moves rapidly across the sky to set in the east twice a day, is shown setting over Mars' afternoon horizon.

Phobos is so close to the martian surface (less than 6,000 kilometers or 3,728 miles away), it only appears above the horizon at any instant from less than a third of the planet's surface.

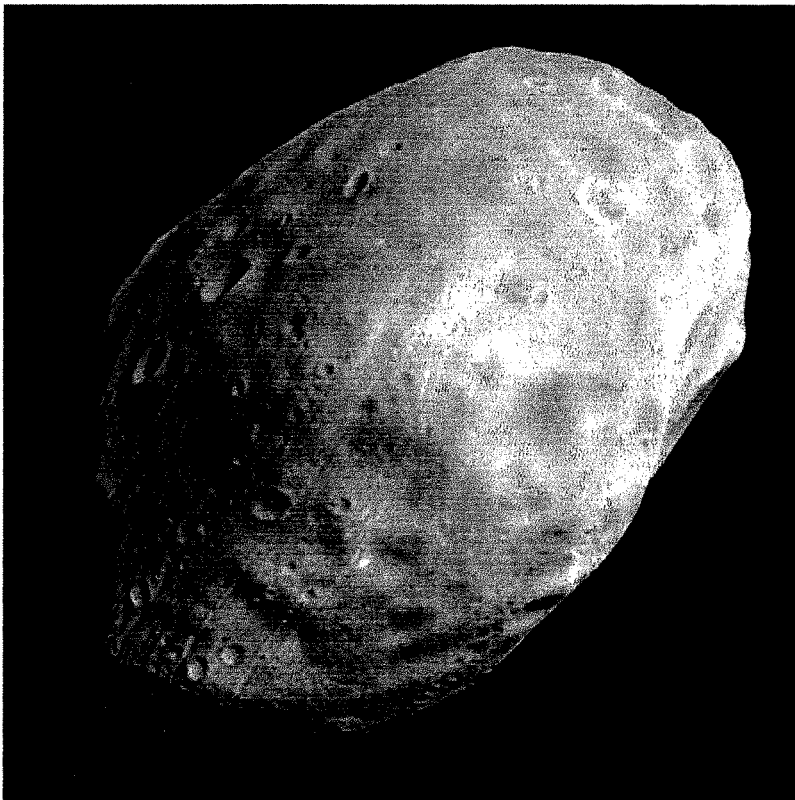
From the areas where it is visible, Phobos looks only half as large as Earth's full moon. Like our satellite, it always keeps the same side facing Mars. The tiny moon is also one of the darkest and mostly colorless (dark grey) objects in the solar system, so for the color image two exposures were needed to see it next to Mars. The faint orange-red hue seen in the wide-angle

image is a combination of the light coming from Mars and the way the camera processes the image.

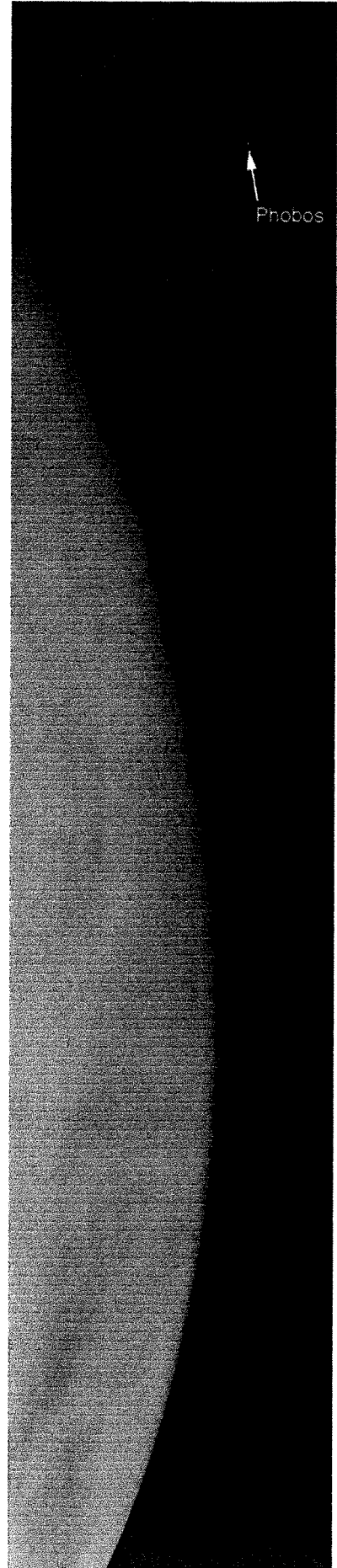
On June 1, the Mars Global Surveyor spacecraft was slewed eastward to capture these views of the inner moon, Phobos, shortly before it set over the afternoon limb. Credit: NASA/JPL/Malin Space Science Systems

<http://spaceflightnow.com/news/n0306/24phobos/>

The top picture is a high-resolution image that shows Phobos' "trailing" hemisphere (the part facing opposite the direction of its orbit). At a range of 9,670 kilometers (6,009 miles), this image has a resolution of 35.9 meters (117.8 feet) per pixel. The image width (diagonal from lower left to upper right) is just over 24 kilometers (15 miles).



A high resolution image of Phobos was taken by Mars Global Surveyor from about 6,010 miles away. Credit: NASA/JPL/Malin Space Science Systems



## OUT OF ROUND SURPRISINGLY FLAT STAR FOUND

Stars are commonly thought to be round, but astronomers have long known this is never quite true. Even Earth, owing to its rotation, bulges a bit at the midsection. New observations, however, have detected the flattest star ever. The fast-spinning star is about 50 percent wider at its equator than if measured

The latest news from Astronomy Now and Spaceflight Now

### FOAM 'MOST PROBABLE' CAUSE OF COLUMBIA DISASTER

A member of the Columbia Accident Investigation Board said Tuesday, for the first time, that a foam strike during the shuttle's launching is the "most probable cause" of the disaster.

He also said analysis of recovered debris indicates a large portion of the ship's left wing broke off in the shuttle's final seconds at the point where the catastrophic breach occurred.

<http://spaceflightnow.com/shuttle/sts107/030624cause/>

### SPACEFLIGHT NOW INTERVIEWS STATION'S RESIDENT CREW

The international space station's Expedition 7 crew — commander Yuri Malenchenko and science officer Ed Lu — spent about 20 minutes talking with Spaceflight

Now's Steven Young on Tuesday in an exclusive live interview. The interview is presented here in its entirety.

[http://qs240.pair.com/sfnvideo/video/0306/030624isesevent\\_qt.html](http://qs240.pair.com/sfnvideo/video/0306/030624isesevent_qt.html)

### SOHO ENGINEERS BATTLE TO OVERCOME ANTENNA PROBLEM

One of the world's premiere Sun-watching observatories has suffered a glitch that threatens to hamper its future studies of our nearest star.

<http://spaceflightnow.com/news/n0306/22soho/>

from pole to pole. The standard model of stellar composition and rotation --which assumes solid-body rotation and a mass concentration at the centre of the star -- can't account for the extreme out-of-round shape. Researchers said the finding presents "an unprecedented challenge for theoretical astro-

physics."

The star, called Achernar, is about six times more massive than the Sun. It sits 145 light-years away in the Southern Hemisphere constellation Eridanus, the River. The results will be published in the journal *Astronomy & Astrophysics*. -- Dr James Biggs

## DELTA AQUARIDS

The Delta Aquarids are better seen by observers in the Southern Hemisphere, both because of the radiant's higher altitude and because it is winter, with more transparent skies. To best observe the Delta Aquarids wear appropriate clothing for the weather. In the Southern Hemisphere, the radiant will eventually reach a very high altitude, so it is recommended that you align your lawn chair with feet pointing either north or south, and set the center of your gaze to a point between 45° and 60° above the horizon.

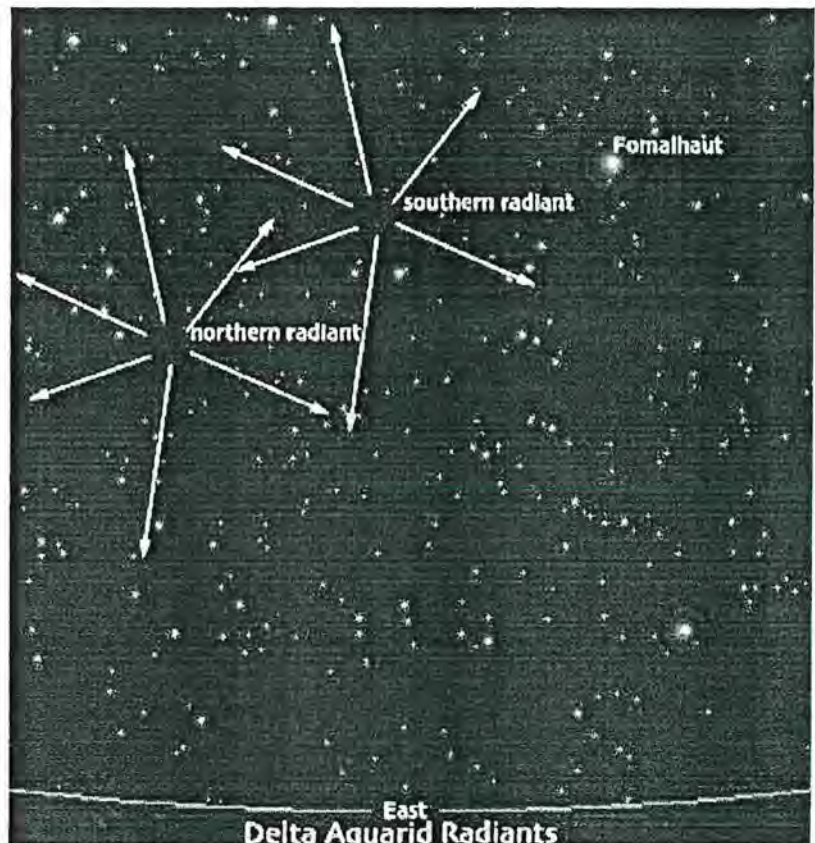
Do not look directly at the radi-

ant, because meteors directly in front of you will not move much and fainter ones might be missed. Decent numbers of Delta Aquarids can be seen after midnight local time.

### The Radiant

The duration of the southern Delta Aquarid meteor shower covers the period of July 14 to August 18. Maximum currently occurs on July 29/30 (solar longitude=125 deg), from an average radiant of RA=339°, DEC=-17°. The maximum hourly rate typically reaches 15-20.

[http://cometransmeteors.org/meteors/showers/delta\\_aq\\_obs.html](http://cometransmeteors.org/meteors/showers/delta_aq_obs.html)



This represents the view from mid-southern latitudes at about 11:00 p.m. local time around July 31. The red line across the bottom of the image represents the horizon.

## UNIVERSE SLIGHTLY SIMPLER THAN EXPECTED

The universe just became a little less mysterious. Using images from the Hubble Space Telescope, astronomers at the University of Florida have concluded that two of the most common types of galaxies in the universe are in reality different versions of the same thing. In spite of their similar-sounding names, astronomers had for decades considered “dwarf elliptical” and “giant elliptical” galaxies to be unique.

The findings, fundamentally alter astronomers’ understanding of these important components of the universe, making it easier to understand how galaxies form in the first place. “This helps to simplify the universe because we replace two distinct galaxy types with one,” said Alister Graham, a UF astronomer and lead author of the paper. “But the implications go beyond mere astronomical taxonomy. Astronomers had thought the formation mechanisms for these objects must be different, but instead there is a unifying construction process.”

Galaxies, the building blocks of the visible universe, are enormous systems of stars bound together by gravity and scattered throughout space. There are several different types, or shapes. For example, the Milky Way galaxy, in which the Earth resides, is a “spiral” galaxy, so

named because its disk-like shape has an embedded spiral arm pattern. Other galaxies are known as “irregular” galaxies because they do not have distinct shapes. But together, dwarf and giant elliptical galaxies are the most common.

For the past two decades, astronomers have considered giant elliptical galaxies, which contain hundreds of billions of stars, and dwarf elliptical galaxies, which typically contain less than one billion stars, as completely separate systems. In many ways it was a natural distinction: Not only do giant elliptical galaxies contain more stars, but the stars also are more closely packed toward the centers of such galaxies. In other words, the overall distribution of stars appeared to be fundamentally different.

Graham with Rafael Guzmán, decided to take a second look at the accepted wisdom. The pair analyzed images of dwarf elliptical galaxies taken by the Hubble Space Telescope and combined their results with previously collected data on over 200 galaxies. The resulting sample revealed that the structural properties of the galaxies varied continuously between the allegedly different dwarf and giant galaxy classes; in other words, these two types were just relatively extreme versions of the same

object—putting to rest a “very puzzling” question.

In astronomy, like in physical anthropology, there is a deep connection between the classification of species and their evolutionary connections. The bottom line is that the new work of Graham and Guzmán has made life a little bit simpler for those of us who want to understand how galaxies are formed and have evolved.

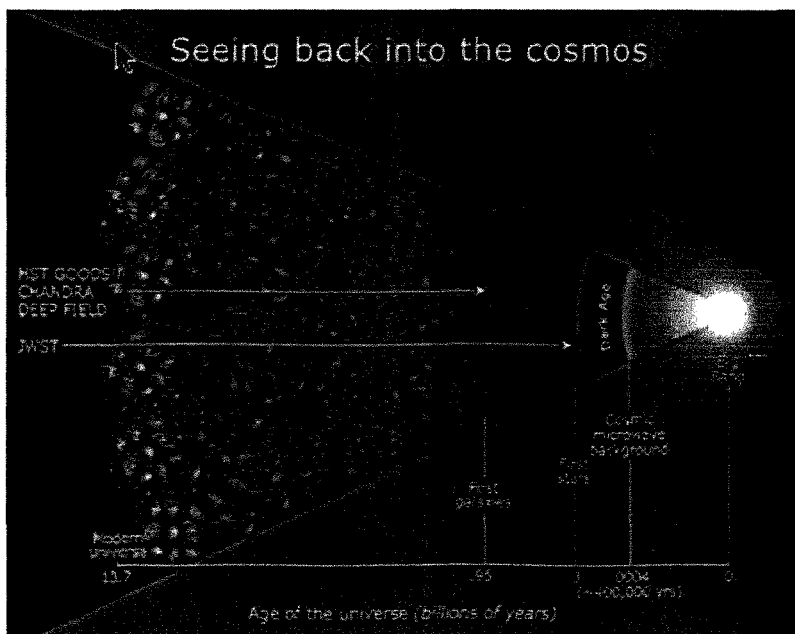
In recent years, Graham said, a number of studies had revealed that the innermost centers of giant elliptical galaxies – the inner 1 percent – had been scoured out or emptied of stars. Astronomers suspect that massive black holes are responsible, gravitationally hurling away any stars that ventured too near and devouring the stars that came in really close.

This scouring phenomenon had tended to dim the centers of giant elliptical galaxies, which ran counter to the trend that bigger galaxies tend to have brighter centers. The dimming phenomenon was also one reason astronomers had concluded dwarf and giant galaxies must be different types.

Building on recent revelations showing a strong connection between the mass of the central black holes and the properties of their host galaxies, Graham and his colleagues introduced a new mathematical model that simultaneously describes the distribution of stars in the inner and outer parts of the galaxy.

“It was only after allowing for the modification of the cores by the black holes that we were able to fully unify the dwarf and giant galaxy population,” Graham said.

<http://www.spaceflightnow.com/news/n030421simple/>



## POVG MEETING - MINUTES

Perth Observatory Volunteer Group Inc

Minutes Of Meeting May 26th  
Meeting Commenced at 7.20

Attendance.

T.Dunn. J.Morris. L.Martin.L.Bell.  
B.Hollibon. J.Alcroft J.Milner.  
J.Biggs. J.Colletti. M.Zangerer.  
M.Freeman. E.Cowlshaw.  
B.Harris. E.Walker. D.Alderson.  
L.Robinson

Apologies.

T.Beston. F.Bilki. D.Hartley.  
A.MacNaughtan. R.Taylor.  
S.Schediwy. D.Emrich. J.Bell.  
T.Turner.

Minutes of the Previous Meeting. Agreed that they were a true and correct record on the motion of

M.Freeman and L.Martin

Treasurers Report. B.Harris presented an audited report duly signed by Auditor G.Sweeney.

The seat plaques had been paid for and the bank account now has

a balance of \$118.13. It was agreed that the name of J.Morris Secretary be added to the list of office bearers able to sign cheques.

Chairmans Report. T.Dunn showed the seat plaques he had obtained at a cost of \$90.00. J.Morris agreed to fix them to the seats. The funding application had been sent in to the

Regional Development Fund and a response was expected by the end of the month. A letter from C.Bell was tabled thanking the group for their card and best wishes, L.Bell reported that she was halfway through her Chemotherapy treatment and was progressing well. M.Freeman reported on his progress with the proposed trip to the Shoemaker Impact Crater, details would be conveyed to all Members, regarding Dates, Times, and Costs.

T.Dunn asked whether final figures were available regarding numbers attending

Public tours for the past season. J.Biggs stated that preliminary figures were that 5300 had attended, about 600 down on last year.

The Chairman then welcomed 3 new members to the group, J.Coletti. M.Zangerer. and E.Walker.

Other Business.

J.Biggs stated that the trip to New Norcia had roused a lot of interest, final details had still to be finalised, but it was hoped the event would take place around the end of June. He asked whether there were any suggestions for speakers to address the Volunteer group at the monthly meetings.

The Chairman T.Dunn reported that he would be absent from the next meeting as he would be on holiday in the U.K.

There being no further General Business the Meeting closed at 8.15.

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Curtin Uni (enter the Uni from the SW side)

DATE: Wednesday 2 July 2003

TIME: 7:30pm

COST: \$5 (call Perth Observatory to book tickets)

## 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

**POVG**  
Perth Observatory Volunteers Group



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

## COMING EVENTS FOR JULY

- 2nd - 4th - Moon passes Jupiter and Regulus (the brightest star in the constellation Leo The Lion)(evening sky).
- 3rd - Asteroid 1999 LT7 near-Earth flyby (0.070 AU).
- 4th - Earth at Aphelion (1.017 AU From Sun).
- 4th - Henrietta Leavitt's 135th Birthday (1868)
- 8th - Venus Passes 0.8 Degrees From Saturn
- 11th - Moon at perigee
- 14th - Full Moon. Avoid nights around this date for star parties.
- 14th - Asteroid 1566 Icarus closest approach to Earth (0.978 AU).
- 17th - Moon Occults Mars
- 19th - Asteroid (976) Beniamina occults a 5.7 magnitude star (easily visible in binoculars) (evening sky).  
Parts of Southern Australia will see this easily visible occultation. For more information, visit [http://www.netstevepr.com/Asteroids/special/0719\\_976.htm](http://www.netstevepr.com/Asteroids/special/0719_976.htm).
- 20th - Asteroid 2000 OL8 near-Earth flyby (0.055 AU).
- 23rd - Moon at apogee
- 26th - Mercury and Jupiter conjunction. Look low on the North Western horizon for two bright 'stars' close together (evening sky).
- 26th - Mercury Passes 0.3 Degrees From Jupiter
- 26th - Asteroid 2000 PH5 near-Earth flyby (0.012 AU).
- 29th - South Delta-Aquarids Meteor Shower Peak.
- 30th - Mercury and Regulus conjunction (evening sky).
- 31st & August 1st - Moon passes Jupiter, Mercury and Regulus (the brightest star in the constellation Leo The Lion). Low on the Western horizon but worth a look (evening sky).
- 31st - Mars Stationary

<http://www.ozskywatch.com/ama2/space/skyevent/2003/summary.html#anchor488707>  
<http://www.jpl.nasa.gov/calendar/#0307>

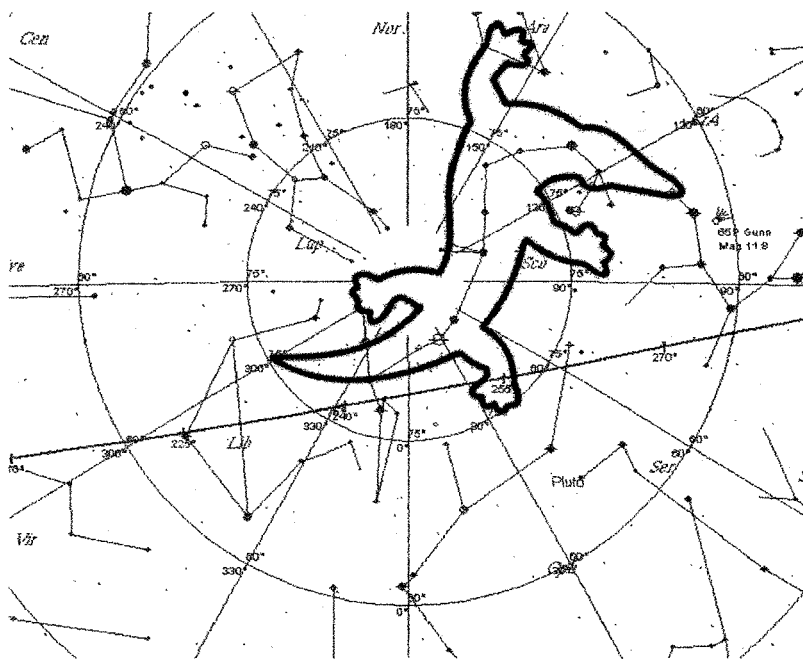
## ABORIGINAL CONSTELLATION OF THE MONTH - JULY: INGALPIR – THE CROCODILE

For the most part, when we view a constellation we can only wonder at what mind-altering drugs that constellation's authors were using when they invented it. However, the constellation that we know as Scorpius is a notable exception to the rule. It really does look like a scorpion, complete with head and stinger.

Aboriginal sky watchers knew Scorpius as Ingalpir the crocodile, and once again it actually resembles its namesake. Members of Australia's northern tribes feared crocodiles and have created many legends about those who have no respect for these dangerous animals. Some groups even saw three men within the crocodile, one playing the didgeridoo and the other two singing and clapping sticks.

For others, Ingalpir's appearance in early morning December skies meant that Malay traders would arrive to exchange knives and axes for sea cucumber, which they would trade to the Chinese.

Astronomically, Scorpius is a very rich region. Its brightest



star was known to Greek astronomers as Antares, which means 'Rival of Mars', because of its redness. In Greek mythology, Scorpius was the scorpion that killed Orion. To the Romans it was Cor Scorionis, which means 'heart of the scorpion'. For Aboriginal sky watchers, it was known as Djuit. The globular clus-

ter M4, and the open clusters M6 (the Butterfly cluster) and M7, also lie within the scorpion's boundary. And of course, when we look in the direction of Scorpius and Sagittarius, we are looking towards the centre of our own Milky Way galaxy.

Frank Bilki

PERTH OBSERVATORY  
VOLUNTEERS GROUP INC.  
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  
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 <a href="mailto:ngc2070@bigpond.com">ngc2070@bigpond.com</a> )

**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](mailto:ngc2070@bigpond.com)

To unsubscribe send an email to:  
[perthobsvollies-unsubscribe@yahoogroups.com.au](mailto:perthobsvollies-unsubscribe@yahoogroups.com.au)

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

**HAPPY BIRTHDAY VOLLIES & STAFF FOR JUNE**

BEVAN HARRIS	JOHN MORRIS	ROBERT TAYLOR,
KAREN KOTZE	JOHN PEARCE	DAVID TIGGERDINE
VIC LEVIS	LLOYD ROBINSON	
ROB LONEY	VERA SMITH	

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