

May 2004

VollieNews

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

OBSERVATORY'S NEW ALL-SKY CAMERA TAKES OFF



The Observatory all sky camera has started operating, and so far all has gone well. Comet NEAT shows up OK under Canopus, and the camera appears to have enough sensitivity. Orion Neb is an easy object as well.

The camera is on the roof of the Observatory, and is set at a specific Alt / Az and left running unattended. Various small problems are still to be remedied.

Imagery is available through the Perth Observatory Web site.

This site is undergoing major surgery right now, and while it is basic, it loads very quickly. www.wa.gov.au/perthobs

The cloud of the last few days has hindered development, but the system will be available for mid May.

Cheers. Peter Birch

TOTAL ECLIPSE OF THE MOON

The Total Lunar Eclipse was enjoyed by all under clear skies, with a balmy 15 degree minimum. This was quite a dark eclipse, with the moon not getting as red a

seen previously. As a bonus, there were a lot of meteors from the Eta Aquariids. Second bonus was the sight of Comet Linear 2002T7 in the east

during totality. Bright - 2nd magnitude - coma, and a 4degree tail visible in binoculars. Pictures on show at the next vollie night. Cheers Peter Birch.

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DATES AND TIMES for Vollie Training and Meeting Nights
Astronomy news & events for May/June | Moon Eclipse at the Observatory
Cassini images of Saturn | Evidence of Giant Meteor Collision

Cassini's latest image shows bands of clouds and lace

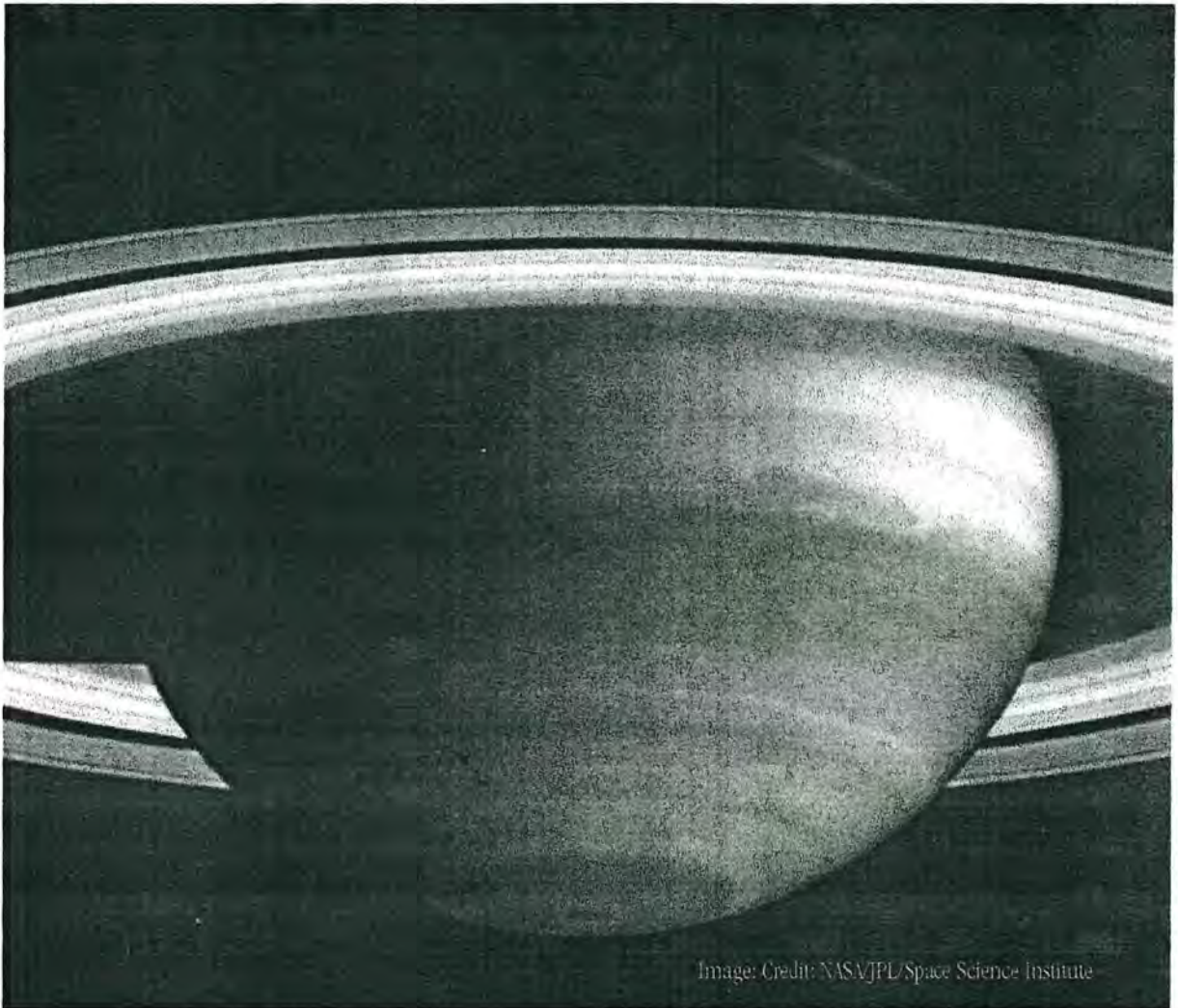


Image: Credit: NASA/JPL/Space Science Institute

As Cassini nears its rendezvous with Saturn, new detail in the banded clouds of the planet's atmosphere are becoming visible.

Cassini began the journey to the ringed world of Saturn nearly seven years ago and is now less than two months away from orbit insertion on June 30. Cassini's narrow-angle camera took this image on April 16, 2004, when the spacecraft was 38.5 million kilometres (23.9 million miles) from Saturn.

Dark regions are generally areas free of high clouds, and bright areas are places with high, thick clouds which shield the view of the darker areas below. A dark spot is visible at the south pole, which is remarkable to scientists because it is so small and centered. The spot could be affected by Saturn's magnetic field, which is nearly aligned with the planet's rotation axis, unlike the magnetic fields of Jupiter and Earth. From south to north, other notable features are the two white spots just above

the dark spot toward the right, and the large dark oblong-shaped feature that extends across the middle. The darker band beneath the oblong-shaped feature has begun to show a lacy pattern of lighter-coloured, high altitude clouds, indicative of turbulent atmospheric conditions.

The cloud bands move at different speeds, and their irregularities may be due to either the different motions between them or to disturbances below the visible cloud layer. Such disturbances might be powered by the planet's internal heat; Saturn radiates more energy than it receives from the Sun.

The moon Mimas (396 kilometres, 245 miles across) is visible to the left of the south pole. Saturn currently has 31 known moons. Since launch, 13 new moons have been discovered by ground-based telescopes. Cassini will get a closer look and may discover new moons, perhaps embedded within the planet's magnificent rings.

This image was taken using a filter sen-

sitive to light near 727 nanometers, one of the near-infrared absorption bands of methane gas, which is one of the ingredients in Saturn's atmosphere. The image scale is approximately 231 kilometres (144 miles) per pixel. Contrast has been enhanced to aid visibility of features in the atmosphere.

<http://spacelighting.com/news/n0405/14cassinisaturn/CICLOPS/SPACE SCIENCE NEWS RELEASE>
Posted: May 14, 2004.

'Smoking gun' evidence of giant meteor collision

Evidence is mounting that 251 million years ago, long before the dinosaurs dominated the Earth, a meteor the size of Mount Everest smashed into what is now northern Australia, heaving rock halfway around the globe, triggering mass volcanic eruptions, and wiping out all but about ten percent of the species on the planet.

The "Great Dying," as it's called, was by far the most cataclysmic extinction event in Earth's history, yet scientists have been unable to finger a culprit as they have with the dinosaur extinction. A new paper published in *Science*, however, claims to identify the crater made by that meteor, and it builds upon an ongoing body of evidence by researchers at the University of Rochester and the University of California at Santa Barbara (UCSB), that points the finger for the Great Dying squarely at the heavens.

"This is very likely the impact site we've been looking for," says Robert Poreda, professor of earth and environmental sciences at the University of Rochester. "For years we've been observing evidence that a meteor or comet hit the southern hemisphere 251 million years ago, and this structure matches everything we've been expecting."

In 2001, Poreda and Luann Becker, research scientist in geological sciences at UCSB, announced that they had detected in 251-million-year-old strata, specific isotopes of helium and argon trapped inside buckyballs—a cage-like formation of carbon atoms—that could only have come from space. Since they were laid down in this same strata around much of the globe, the implication was that a giant meteor had struck the Earth, vaporized, and settled around the southern hemisphere. This past November, the same three authors—Poreda, Becker, and Ashish Basu, professor of earth and environmental sciences at the University of Rochester—published another article in *Science* that found actual pieces of the meteorite that struck the Earth in the same global strata.

Many experts scoffed at the idea of a giant meteor causing the mass extinction between the Permian and Triassic periods, but Poreda points out that many also scoffed at the idea that a meteor was responsible for a later and lesser extinction at the Cretaceous/Tertiary boundary that marks the end of the dinosaurs. Now, the impact theory is largely accepted.

The team knew that the chances of finding the crater, even one from an impact

large enough to nearly wipe out life on Earth, would be difficult because the majority of the Earth is covered by ocean. Had the meteor struck there, its telltale crater would have long ago disappeared. As luck would have it, an oil-drilling exploration team in 1970 found a "dome" in the area of Bedout, just off the northwestern coast of Australia. Now covered by 2 miles of sediment, this area was most likely dry land 251 million years ago.

Frequently, such domes herald large oil deposits, but in this case the drilling team found only what it labelled as "volcanic rock." The core samples were shelved and forgotten for 25 years, until in 1995 a report in a journal aimed at the oil industry mentioned that the rock might have been formed from a meteor impact.

It wasn't until Becker caught wind of the "volcanic" find in 251 million year old rock that the team members began to think they'd found their smoking gun. Poreda and Becker investigated the core samples first hand. "They were unlike any volcanic rocks I've ever seen," says Poreda. "In a volcanic explosion you may find angular pieces of rock that are broken apart mixed with the volcanic melt. In these samples, though, the rocks were shock melted from an impact. We left convinced Bedout was our crater."

The clincher was the presence of a feldspar glass in the shape of a feldspar crystal. Such features do not form in volcanic eruptions. Many of the plagioclase samples showed evidence of sustaining an intense shock, meaning the meteor likely hit a bed that contained feldspar crystals, shock-melted their interiors, melting their insides the way a microwave oven might bake a potato's inside while leaving the outer areas cool.

"Once we looked at Bedout with the understanding that it was likely a crater, the geophysics just fell into place," says Poreda.

Geophysical analysis shows the rock strata underlying the dome at Bedout is fractured exactly the way the team expected—showing rock strata older than 251 million years old broken apart, with younger rock above laid down without the fractures. Simulations of a six-mile wide rock striking the area suggest a crater rim should be visible about 60 miles from the central dome, and despite the extreme age of the impact site and the rearrangement of continental plates since then, there is evidence of a rim

at that distance. The team has plans to explore the geophysical outlay of the region with more scrutiny.

Coincidentally, the Bedout crater, at 120 miles across, is almost exactly the same size as the Chicxulub crater in the Caribbean that has been identified as the impact site of the meteorite that dealt the dinosaurs their death blow. It's likely that the bodies that struck at each site were of the same size and travelling at similar speeds.

Along with both impacts correlating strongly with two of the greatest extinctions in Earth's history, the team has found that massive lava flows in two different parts of the world have similar correlations. Basu showed that massive lava flows in India date back precisely to the Chicxulub impact, and recently he also reported that similar giant lava flows in Siberia coincide exactly with the Bedout impact.

"There have been five mass extinctions throughout the Earth's history," says Poreda. "Now we have very strong evidence that massive meteor impacts happened precisely at two of those extinctions."

UNIVERSITY OF ROCHESTER NEWS RELEASE
Posted: May 14, 2004
<http://spaceflightnow.com/news/n040514impact/>

Astro News

LATEST CASSINI IMAGE SHOWS BANDS OF CLOUDS AND LACE

As Cassini nears its rendezvous with Saturn, new detail in the banded clouds of the planet's atmosphere are becoming visible. Cassini began the journey to the ringed world of Saturn nearly seven years ago and is now less than two months away from orbit insertion on June 30.

<http://spaceflightnow.com/news/n0405/14cassini/saturn/>

DYING STAR SCULPTS RUNGS OF GAS AND DUST

A new image, taken with NASA's Hubble Space Telescope, reveals startling new details of one of the most unusual nebulae known in our Milky Way.

Catalogued as HD 44179, this nebula is more commonly called the "Red Rectangle" because of its unique shape and colour as seen with ground-based telescopes.

<http://spaceflightnow.com/news/n0405/11hubble/>

GIANT GALAXY'S VIOLENT PAST COMES INTO FOCUS

Long-exposure images of the giant elliptical galaxy M87 by NASA's Chandra X-ray Observatory, together with radio observations, have provided spectacular evidence of repetitive outbursts from the vicinity of the galaxy's supermassive black hole. Magnetised rings, bubbles, plumes and jets ranging in size from a few thousand to a few hundred thousand light years point to ongoing violent activity for hundreds of millions of years.

<http://spaceflightnow.com/news/n0405/10chandra/>

XMM-NEWTON DETECTS X-RAY 'SOLAR CYCLE' IN DISTANT STAR

For years, astronomers have wondered whether stars similar to the Sun go through periodic cycles of enhanced X-ray activity, like those often causing troubles to telephone and power lines here on Earth. Europe's

X-ray observatory XMM-Newton has now revealed for the first time a cyclic behaviour in the X-ray radiation emitted by a star similar to the Sun.

<http://spaceflightnow.com/news/n0405/10solarcycle/>

GRAVITY PROBE B UPDATE

Gravity Probe B – a NASA experiment to test two predictions of Albert Einstein's Theory of General Relativity – continues to perform well. Launched April 20 from Vandenberg Air Force Base, Calif., the spacecraft

remains in its science mission orbit within the plane of its guide star, IM Pegasi, and program managers are expecting a smooth and successful transition into the science phase of the mission.

<http://spaceflightnow.com/news/n0405/10gbstatus/>

TWO EXTREMELY HOT EXOPLANETS CAUGHT IN TRANSIT

A European team of astronomers are announcing the discovery and study of two new extra-solar planets. The observations were performed in March at the Paranal Observatory in Chile.

<http://spaceflightnow.com/news/n0405/07exoplanet/>

CLOSER TO THE MONSTER

Fulfilling an old dream of astronomers, observations with the Very Large Telescope in Chile have now made it possible to obtain a clear picture of the immediate surroundings of the black hole at the centre of an active galaxy.

<http://spaceflightnow.com/news/n0405/08blackhole/>

CASSINI SPIES ON TITAN

The veils of Saturn's most mysterious moon have begun to lift in Cassini's eagerly awaited first glimpse of the surface of Titan, a world where scientists believe organic matter rains from hazy skies and seas of liquid hydrocarbons dot a frigid surface.

<http://spaceflightnow.com/news/n0405/06cassinititan/>

STUDY MAY CAST DOUBT ON 1996 REPORT OF PAST MARS LIFE

The scientific debate over whether a meteorite contains evidence of past life on Mars continues to intensify, with colleagues of the team that

announced the possibility in 1996 revealing new findings that may cast doubt on some of that earlier work.

<http://spaceflightnow.com/news/n0405/05marslife/>

NASA'S GENESIS SPACECRAFT ON FINAL LAP TOWARD HOME

The Genesis spacecraft flew past Earth a few days ago in a loop that puts it on track for home – and a dramatic mid-air recovery Sept. 8. The mission was launched in 2001 to capture samples of the solar wind for return to Earth-bound scientists.

<http://spaceflightnow.com/news/n0405/05genesis/>

HUBBLE TELESCOPE SHOWS DEMISE IN ICE AND FIRE

The Bug Nebula is one of the brightest and most extreme planetary nebulae known. At its center lies a superhot, dying star smothered in a blanket of

hailstones. A new Hubble image reveals fresh detail in the wings of this cosmic butterfly.

<http://spaceflightnow.com/news/n0404/30fireandice/>

PAPER PROBES PULSAR PAIR

The only known gravitationally bound pair of pulsars – extremely dense, spinning stars that beam radio waves – may be pirouetting around each other in an intricate dance.

<http://spaceflightnow.com/news/n0404/30pulsarpair/>

NASA'S GRAVITY PROBE IN ITS SCIENCE MISSION ORBIT

In its first week on orbit, Gravity Probe B has achieved many successes that will ensure a smooth transition into the science phase of the mission and the best possible experimental accuracy. The spacecraft has already achieved a science mission orbit, within the plane of the Guide Star, IM Pegasi, and its inclination error is six times better than expected.

<http://spaceflightnow.com/news/n0404/28gbstatus/>

CLOUDS FROM AIRCRAFT EXHAUST MAY WARM CLIMATE

NASA scientists have found that cirrus clouds, formed by contrails from aircraft engine exhaust, are capable of increasing average surface temperatures enough to account for a warming trend in the United States that occurred between 1975 and 1994.

<http://spaceflightnow.com/news/n0404/27clouds/>

POVG Minutes - Annual General Meeting

Perth Observatory Volunteer Group Inc
Minutes of Meeting April 19th 2004

Present.

L.Bell. B.Hollebon. L.Martin. A.Mcnaughton.
R.Tonnello. J.Alcroft. J.Morris.M.Freeman.
R.Boelen. E.Walker. A.Williams. P.Birch.
L.Robinson. M.Haslam
J.Milner. G.Lowe. B.Harris. F.Bilki.
D.Alderton. G.Coletti.

Apologies.

D.Emrich. T.Beardsmore. T.Beston. V.Smith.
K.Kotze.

Meeting Opened at 7.10

Confirmation of Minutes. Agreed as a true
and correct record . Moved D.Alderton
Seconded R.Boelen

B.Harris stated that his apology for the
March Meeting had not been recorded in
the Minutes

General Business.

Nil.

Treasurer's Report.

There had been no financial transactions
during the past month

A.G.M.

Treasurers Report. B.Harris stated that there
had only been 4 financial transactions dur-
ing the past Year. Monies in the Bank
account stood at \$210,33, The years
accounts would be Audited and signed by
the next Meeting

Chairman's Report .

M.Freeman stated that his Annual report
was printed in the Newsletter . He wished to
thank all the members of the Group for
their efforts over the past year and said that
he was sure that the volunteers felt as he
did, that it was a privilege to assist the
Observatory and thanked all members of the
Staff for their support. He noted with regret
that Tom Smith had left us and welcomed
Rick Tonnello.

The Chairman then declared all
Committee positions vacant and called for
nominations.

G.Lowe reported that he had spoken to
Vice Chairman K.Kotze on the phone, who
wished it to be noted that due to outside
pressures she would not stand for re-election

The following Nominations were

received.

Chairman . . . M.Freeman. nominated
by L.Martin. seconded F.Bilki.

Vice Chairman . . . E.Walker. nominated
by B.Harris. seconded J.Alcroft.

Secretary. . . J.Morris. nominated by
J.Alcroft seconded B.Hollebon.

Treasurer. . . B.Harris. nominated by
J.Morris. seconded J.Alcroft.

There being no further Nominations the
above members were elected unopposed

J.Alcroft agreed to remain Editor of the
Newsletter.

The Chairman raised the matter of
future activities of the Group and whether
the present structure needed to be retained.
B.Harris pointed out that there might well
be opportunities in the future when the cur-
rent formation of the Incorporated Group
would be an advantage and suggested that
we remain with the present format.
M.Freeman asked for suggestions for adver-
tising the Shoemaker Impact Crater Trip to
groups that might be interested in joining
the trip

P Birch .End of Season Report.

P Birch stated with regret that we were
about to lose two long standing members in
Trish Turner whose work in the archiving
section had been invaluable, and Bert
Hollebon who was finding it increasingly
difficult to drive at night , he thanked Bert
for his efforts over the years and hoped he
would still come to the Observatory during
the day.

He pointed out to all members just how
valuable their efforts were to the Observatory
and stressed that without the Volunteer
Group the night tours would be impossible
to maintain. This year the Tours had gener-
ated \$120,000, and the total number of
hours contributed by the Group was the
equivalent of having an additional full time
staff member. Members should be aware
that they were welcome to bring friends or
relatives to the Observatory and have the use
of the Telescopes, just contact the
Observatory and book a convenient time
Peter commented on the opening of the
Planetarium and stated that he felt it assist
bookings for the night Tours ,but might
have some effect on numbers coming to the
Observatory during the day.

The planned Observatory Web site would
go on line shortly and there was some dis-
cussion on using it as an Advertising medi-
um for the Night Tours

There were no dramatic plans for the
future, next years program was being
worked out, but would be similar in format
to this years. It was possible that if the
Comets became bright enough we would
run Special Comet viewing Tours as we had
for Mars , if that was the case there would
be a call for members to attend on the rele-
vant nights.

There being no further Business the Meeting
closed at 8.10

L.Bell wished it to be noted that he would be
absent for the next 4 months.

Rare Transit of Sun by Venus

Put a big red circle around June 8 on your calendar. On that day, you may have a chance to see a celestial event not witnessed by human eyes in 122 years when Venus crosses in front of the Sun.

By the end of May 2004, however, Venus will be rapidly dropping back toward the Sun's vicinity, ultimately to disappear as it makes the transition back into the morning sky. That transition day will be June 8.

Normally, Venus would pass unseen, hidden in the brilliant glare of the Sun. But not this time.

For on this Tuesday in June an Venus will making itself evident as a small black spot slowly moving across the solar disk. Portions of the hours-long transit will be visible from many locations around the world, including parts of Europe and America. Some folks will need to make travel plans, however, to see the show.

RARE OPPORTUNITY

This is among the rarest of astronomical events. In fact, between the years 2000 BC and 4000 AD there are only 81 Venusian "transits," as astronomers call them.

Only five times have humans recorded the passage of Venus in front of the Sun (in 1639, 1761, 1769, 1874 and 1882), although it's not impossible that a transit of Venus might have once been seen by chance in ancient times, near sunrise or sunset.

Astronomer Joseph Ashbrook (1918-1980) wrote in "The Astronomical Scrapbook" (Sky Publishing Corporation, 1984): "For those who witness the transit of June 8, 2004, there comes the awesome thought that not a single human being remains alive that observed the last transit of Venus, in December, 1882."

There is some neat math involved in Venus transits, all related to the predictability of its orbit, which is closer to the Sun

than the annual path of Earth.

The circumstances of the transits of Venus repeat themselves with great exactness after a period of 243 years. The intervals between individual transits (in years) currently go as follows: $8 + 121\frac{1}{2} + 8 + 105\frac{1}{2} = 243$. In other words, a pair of transits may occur over a time span of just eight years, but following the second transit, the next will not occur again for more than a century.

Transits of Venus occurred on Dec. 9, 1874 and Dec. 6, 1882. The transit this June is the first one since 1882, but the next will occur 8 years later on June 6, 2012, although this future event will be visible in its entirety only from the Pacific Ocean and the extreme east coasts of Siberia, Japan and Australia (North Americans will see the opening stages before sunset).

Then it will be a long wait once again. On December 11, 2117, Venus will again pass in front of the Sun.

Transits do not occur each time Venus passes from our evening to our night sky because things have to be lined up just right. When a transit occurs, the Sun, Venus and Earth are all in a direct line. But Earth and Venus do not orbit in exactly the same plane around the Sun, so often each planet is either above or below the location that would allow a transit.

Think of it this way: Place two hoops on the ground to represent the orbits of the planets. Place a tennis ball in the middle as the Sun. Now lift one portion of one hoop a few inches off the ground. Only where the opposite side of the lifted hoop touches the ground can you imagine a line that connects all three objects.

LOCATIONS TO WATCH

On June 8, the entire transit will last just more than six hours and will be visible in

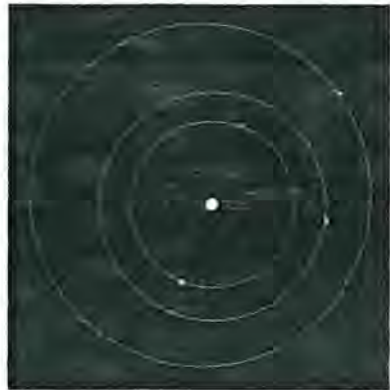
some form across approximately three-quarters of our planet.

Australians will be able to catch the beginning stages before sunset. Europeans will be able to see most, if not all of the transit, starting at around sunrise with the end coming in the early afternoon with the Sun high in the sky. For much of the eastern United States and Canada, the Sun will rise with Venus already on the Sun's disk with the transit nearly over.

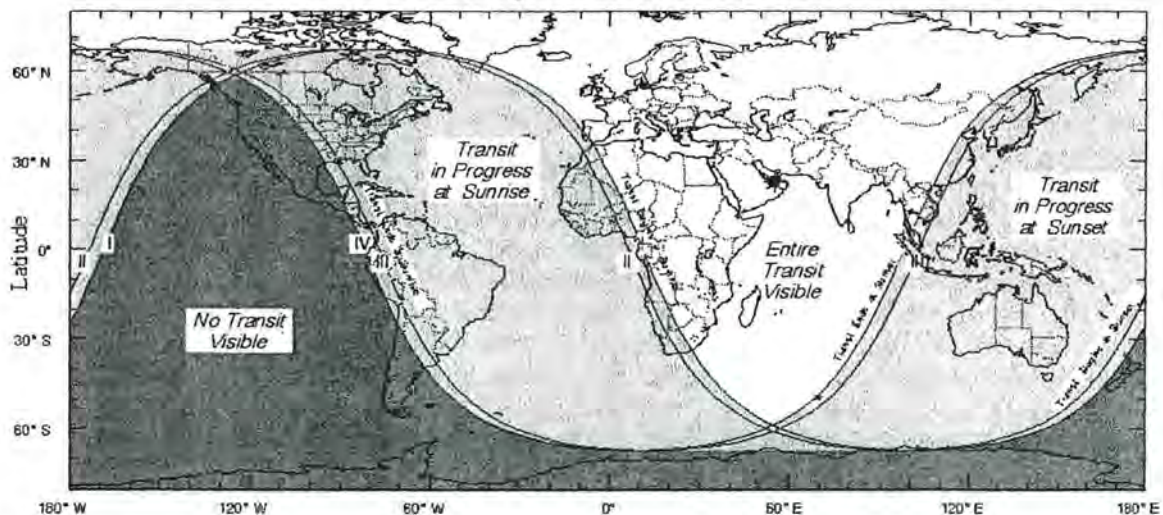
Venus transits are readily visible without telescopes or binoculars, but proper protection must be employed. Never look directly at the Sun, or serious eye damage can result. Viewers should use special, approved filters that can be purchased from reputable dealers of astronomy products. Other tricks can be employed, such as pinhole cameras or simple projection methods, to indirectly and safely view the Sun.

When Venus is in transit across the solar disk, the planet appears as a distinct, albeit tiny, round black spot with a diameter just 1/32 that of the Sun. This size is large enough to perceive with the unaided but properly protected eye.

http://www.space.com/spacewatch/Venus_transit_040206.html



World Visibility of 2004 Transit of Venus



"Back to Basics - Venus"

Venus has been described since ancient times as both the "morning star" (Phosphorus) and the "evening star" (Hesperus) because of its prominent appearance near the Sun. Venus is always bright because it is highly reflective, and it comes closer to Earth than any other planet. Once called Earth's "sister planet" it is now known that Venus is the closest thing to Hell that you could ever imagine. It is a similar size to Earth and is a rocky body, but in all other respects it is nothing like our comfortable home planet.

With an atmosphere of almost pure carbon dioxide, atmospheric pressure about 90 times that of Earth's, a global temperature of 470°C (higher than Mercury's day side) and clouds of sulphuric acid, you would be simultaneously asphyxiated, crushed, roasted and dissolved. This inhospitable place has only a meagre supply of water - less than 30 parts per million (which probably comes from occasional comet impacts). There is no ocean, and no precipitation (it does not rain sulphuric acid).

When observing Venus with a telescope, you will notice that it appears bland and bright. What you see is not the surface of the planet, but the top of a uniform haze of concentrated acid droplets some 60km deep, which extends to 90km above the surface. Its rotation is unusual in that it takes 243 days to rotate, longer than its 225 day year. Thus any spot on its surface has 122 days of sunlight and 121 days of darkness. Its contra-rotation means the Sun rises in the west and sets in the east.

Venus presents a diverse and puzzling geology. Some of its features are:

- * The longest channel in the Solar System (an old lava flow 7,000 km in length - longer than the River Nile)
- * Few impact craters, signifying a relatively young surface
- * Mountains thought to be "active" volcanoes, supported by plumes of upwelling material under the crust
- * Volcanoes typically of 400km diam, 1.5 km high
- * Evidence of explosive vulcanism in the past
 - * Wind erosion patterns
 - * Faults and fractures
 - * Volcanic "pancake" domes up to 7.5 km diam
 - * Volcanic calderas (craters in the top of a volcanic mountain)
 - * Multiple impact craters (which would result from a split impactor like Comet Shoemaker Levy 9)
 - * A double-ring impact basin named Cleopatra similar to some found on the

Moon

- * Flooded impact craters
- * Intensely deformed terrain
- * Smooth halos formed by the bow shock of the atmosphere as projectiles plunge into the planet
- * Possible sedimentary deposits.

The youth of the surface is a puzzle which remains to be solved. The age of the surface is only about 500 million years. This is about twice as old as Earth's average surface age, but much younger than the Moon's. There doesn't seem to be any continuous resurfacing such as that found on Jupiter's moon, Io. There may have been a catastrophic resurfacing which occurred as a one-off event. Or Venus may undergo some cyclic process where heat in the core builds up, breaks through into lava flows, and then returns to a dormant state.

Whatever processes are at work, the planet has been relatively quiet for the last 500m years. There are no plate tectonics working here. (Plate tectonics is the mechanism which causes "continental drift" on Earth and pushes up our highest mountain ranges.) Venus has a thick, one-plate shell, with a surface crust of basalt. The planet is not cool enough for rigid plates to form. It is thought that the crust is somewhat pliable. It gives and bends rather than breaking up into separate plates, because of its high internal and surface heat. Certain features apparent on the surface of Venus remind me of wrinkles on the cooling skin of marmalade.

Studies of Venus's surface have been undertaken by various methods designed to over-

come the fact that we cannot see through the clouds which shroud it so effectively...ence.

A TALE FROM VENUS

Saturn may have rings, but did you know that Venus has a tail? First discovered in the late 1970's by Pioneer Venus Orbiter, the tail of charged particles was discovered 70,000 km from the planet. Recent findings from the SOHO solar probe reveal that the tail extends almost to Earth's orbit - some 45 million kilometres (see diagram).

The Earth does not have a similar tail because of its magnetic field which protects our atmosphere from the solar wind. In the case of Venus, the solar wind strips particles from the upper atmosphere and scatters them in a similar way to the formation of a comet tail.

By Lesa Moore, Senior Guide, Koolang Observatory, and reproduced by permission.
<http://www.aanew.com/Universe/1998/btbv-12980199.htm>

THE MOON HAS A COMET-LIKE COMA AND TAIL. Michael Mendillo of Boston University, reporting at this week's meeting of American Geophysical Union in Baltimore, showed that the moon has a tail, consisting of sodium gas, extending at least 15,000 miles away from the lunar surface. The sodium, Mendillo believes, is released from lunar rocks by meteorite impacts and is later dissipated into space where it is formed into a tail by the force of solar radiation..

Lesla Moore

<http://newton.ex.ac.uk/aip/physnews.36.html>
Physics News 36, May 31, 1991
PHYSICS NEWS UPDATE A digest of physics news items prepared by Philip F. Schewe, AIP Public Information Number 36 May 31, 1991

PHASES OF THE MOON FOR 2004 (WA TIME)

New Moon	First Quarter	Full Moon	Last Quarter
Jan 22 05:05	Jan 29 14:03	Jan 7 23:40	Jan 15 12:46
Feb 20 17:18	Feb 28 11:24	Feb 6 16:47	Feb 13 21:40
Mar 21 06:41	Mar 29 07:48	Mar 7 07:14	Mar 14 05:01
Apr 19 21:21	Apr 28 01:32	Apr 5 19:03	Apr 12 11:46
May 19 12:52	May 27 15:57	May 5 04:33	May 11 19:04
Jun 18 04:27	Jun 26 03:08	Jun 3 12:19	Jun 10 04:02
Jul 17 19:24	Jul 25 11:37	Jul 2 19:09	Jul 9 15:33
Aug 16 09:24	Aug 23 18:12	Aug 1 02:05	Aug 8 06:01
Sep 14 22:29	Sep 21 23:53	Aug 30 10:22	Sep 6 23:10
Oct 14 10:48	Oct 21 05:59	Sep 28 21:09	Oct 6 18:12
Nov 12 22:27	Nov 19 13:50	Oct 28 11:07	Nov 5 13:53
Dec 12 09:29	Dec 19 00:40	Nov 27 04:07	Dec 5 08:53
Dec 12 09:29	Dec 19 00:40	Dec 26 23:06	

<http://www.wa.gov.au/perthobs/hpc5mm03.htm>

Perth Observatory Volunteers Group

2004 Volunteer Training & Meeting nights

Dr Jamie Biggs
Peter Birch
Ralph Martin
Dr Andrew Williams
Rick Tanello
Greg Lowe
Janet Bell
Di Johns
Arie Verveer
John Pearce
Marc Appelhof

PERTH OBSERVATORY STAFF
Director and Govt Astronomer
Astronomer
Astronomer
Astronomer
Astronomer Assistant
Astronomer Assistant
Administration Officer
Clerical Officer
Technical manager
Mechanical technician
Maintenance Person/Cleaner

Mike Freeman
Elaine Walker
John Morris
Bevan Harris

POVG VOLUNTEERS
Chairperson
Vice Chairperson
Secretary
Treasurer and newsgroup moderator
(contact: ngc2070@bigpond.com)

Jeff Alcroft

Editor (contact: callides@iinet.net.au)
or through newsgroup

OBSERVATORY'S VOLUNTEERS ACTIVE MEMBER LIST

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

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

Jun 14; Jul 12; Aug 9

HAVE YOU JOINED THE VOLLIE NEWSGROUP YET?

If you've got any news, information or pics post them on the newsgroup.

To join simply send your email address to Bevan Harris at:
ngc2070@bigpond.com

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



PERTH OBSERVATORY
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<http://www.wa.gov.au/perthobs>

POVG

Perth Observatory Volunteers Group