

december 2006



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monthly newsletter of the johannesburg centre of assa

Old Republic Observatory, 18a Gill Street, Observatory, Johannesburg  
PO Box 412 323, Craighall, 2024



NGC 7293 – The Helix Nebula – Image: Bert van Winsen

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## notice of next meeting – assa johannesburg

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The next monthly meeting of the Johannesburg Centre of the Astronomical Society of Southern Africa will be held at the old Republic Observatory, 18a Gill Street, Observatory, Johannesburg on Wednesday, 10 January 2007 at 20h00  
Guest speaker:

**Dr. Percy Amoils**  
**“Astrophotography”**

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**ATM:** Amateur Telescope Making classes are held on the premises of Parktown Boys' High School on most Saturday afternoons.

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### Article submissions to Canopus:

You are invited to submit short articles and/or letters to the Editor. All formats are welcome (stone tablets included!). Please note that the **deadline for a submission is the 15<sup>th</sup> of the month**, for printing in the following month's edition. Successful articles will appear in both the printed copy (booklet) as well as the full colour electronic PDF version. Please contact the Canopus Editor (contact details above) for further information.

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### ASSA Johannesburg Centre's electronic mailing-lists & subscriptions:

A suite of mailing lists exist; you are encouraged to visit the assajhb website for detailed information.

[www.assajhb.co.za](http://www.assajhb.co.za)

## year-end star party – Henley on Klip

The year-end star party will be held at Brian Fraser's house at Henley on Klip on Saturday, 9 December 2006. Time: 5pm onwards. What to bring: Food, drinks, chairs, umbrellas (to ward off the rain) and of-course, telescopes if you have!

- Start from the **N12... SOUTH of Johannesburg**. (You can get to this from the N1 on the West, or the N3 in the East.)
- Take the **R59 toward Vereeniging**
- About 25km later, pass the Blockhouse Engen One-stop
- Pass the Randvaal turnoff & look for the next exit
- Take **Henley Drive (Exit 27)**
- **Turn left** from the off-ramp **into Henley Drive**
- Pass the stop street at the Total Garage
- Turn **right into Ewelme Rd**, at the next stop street
- Pass the shops to the next stop street
- Turn **left into Iffley Rd**
- Cross the Klip River
- Turn **right** at the stop street **into Hearn Rd**
- Turn **left into Goring Rd**
- Brian's house is on the **left**

### Address

**1772 Goring Road**  
Henley on Klip

### Lost?

- Phone **(016) 366 0955** or **082-568-1391**



## chairman's editorial

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Robert Groess

And so another year draws to a close. It has been an interesting one. Our 5<sup>th</sup> annual ScopeX was a great delight – and continues to move the benchmark for each new committee that little bit higher. The 7<sup>th</sup> biannual ASSA Symposium at Boyden observatory was fantastic and extremely well organized by the Bloemfontein Centre. Various smaller-scale excursions have taken place to exotic locations such as the heart of the Tswaing Crater, amongst other. And our membership base has held steady over the past few years – something that we strive to increase over the coming months and for the future of the Johannesburg Centre.

Much of what you see happening in this Centre of ASSA, is by and large thanks to the unremitting efforts by a few people. Your committee are preoccupied with keeping the engine of this society running smoothly – giving you a great opportunity to offer your input, ideas and services to bring to the society that which it does best - to provide a small but tangible interface to that vast cosmos of which we are a part.

If there are any changes you wish to see in our society, you are invited to volunteer to bring those changes to fruition. Rather than expecting a handful of people to provide monthly entertainment – offer your participation, even if it is in the tiniest of ways, which will add an entirely new dimension to what you get out from the society, as well as how the society benefits from you.

I was going to leave this for the first edition of Canopus next year, but thought it might provide some seeds for inspiration over the festive season. Ideas on the table for the new year include:

- A more diverse monthly meeting profile
- Public and/or 'membership oriented' viewing evenings
- Telescope using classes (perhaps provided in a similar vein to Photography courses)
- Beginners classes for astronomy in general
- Your imagination and support!

In this December edition, Canopus takes you to the shores of that vast and grand cosmic ocean, packed with articles of news from the forefront of the astronomical world. Our local contributors having done an excellent job over the past few months, as they always do, can relax and enjoy a more international flavour with this edition.

With that, I sign off for 2006 wishing you and your families a very merry festive season and good wishes for the new year!

Robert.

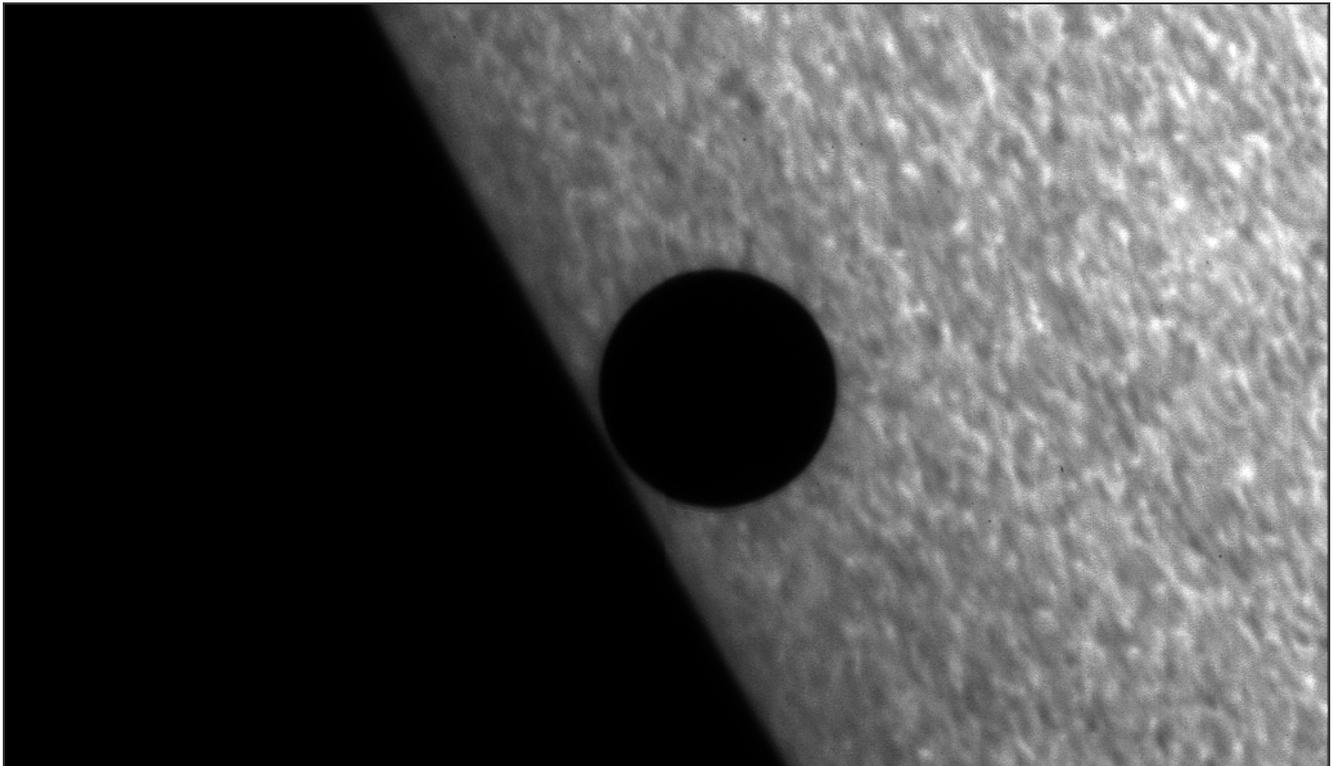
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## transit of mercury observed by hinode

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edited Solar-B news release

Mercury marched in front of the Sun from 19:12 UT on November 8 to 00:09 UT on November 9, at which time it was seen as a small, round-shaped disc on the Sun. The Mercury Transit was observed in Asian countries including Japan in the morning of November 9 local time. Hinode (formerly called Solar-B), which is put on a Sun-synchronous orbit around the Earth, observed the event without atmospheric distortion.



*G-band image obtained with the Solar Optical Telescope (SOT) on 2006-11-08 19:14 UT, just after Second Contact.*

The Solar Optical Telescope (SOT) on board Hinode is currently the largest aperture, most advanced solar telescope flown in space. The SOT consists of the main 50cm aperture Optical Telescope Assembly (OTA) and focal plane package. The combined SOT system is optimized for accurate measurement of the vector magnetic field in the photosphere and dynamics of both the photosphere and chromosphere associated with the magnetic fields.

The SOT provides a continuous, seeing-free series of diffraction-limited images (0.2-0.3") in the 388-668 nm range. The sun-synchronous orbit of Hinode allows a downlink of data nearly every orbit to the Svalbard ground station in Norway (ESA), hence observations will be possible 24 hours a day for about 8 months of the year.

The SOT is designed and developed by an international collaboration between the National Astronomical Observatory of Japan (NAOJ), NASA, Lockheed Martin, Mitsubishi, *et al.*

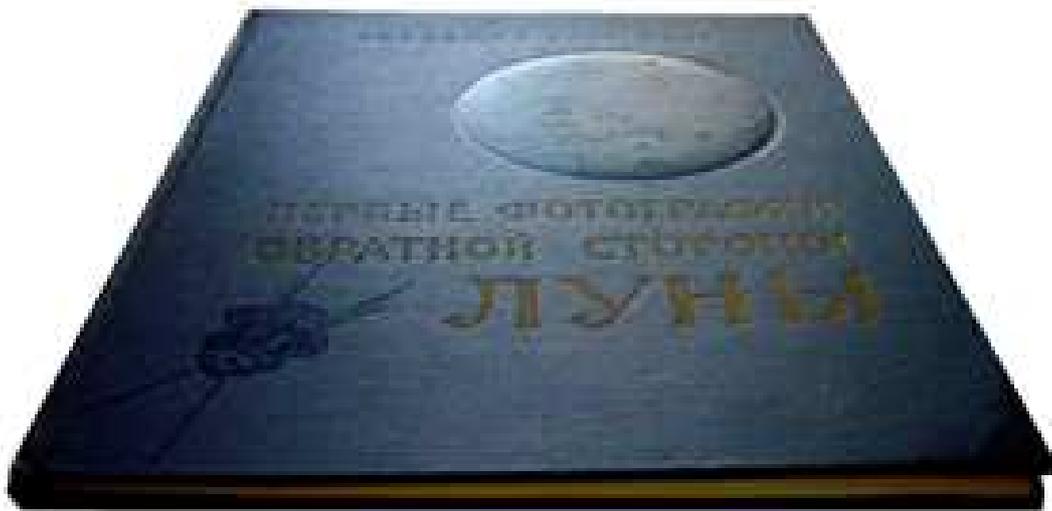
## the moon became a place – 4 decades ago

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translation by Oleg Toumilovitch

During my three-day attendance of the 7<sup>th</sup> ASSA Symposium at Boyden Observatory, I was kindly offered by Gerrit Penning and Phillip Coetze of the Bloemfontein centre, to look at some astronomical books written in Russian. After paging through a few Catalogues of galaxies, my eyes caught sight of a thin blue book with an image of the Moon (Luna) embossed on the front cover. Seconds later we were discussing the possibility for translating it for our ASSA centres so that everybody could enjoy the most exciting news in the USSR in 1959, concerning astronomy and space exploration. Although we know that the first images of the Moon's far side were taken by the camera from Luna-3 spacecraft, in this book it's referred to as an “automatic interplanetary station”. – *Oleg Toumilovitch*

**USSR Academy of Sciences  
FIRST PHOTOGRAPHS OF THE FAR SIDE OF THE MOON  
MOSCOW 1959**



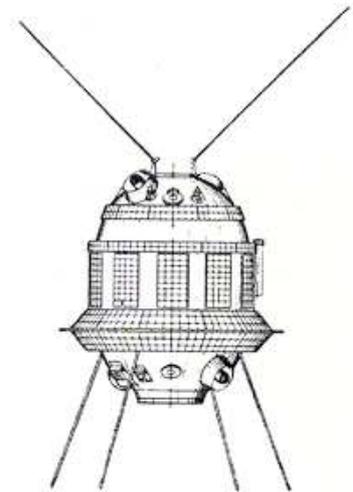
### FOREWORD

The experimental research of space continues. On October 4<sup>th</sup>, 1959, The Soviet Union has conducted a successful launch of the third space rocket, as part of the space research program and for obtaining photographs of the far side of the Moon. An automatic interplanetary station passed by at close range from the Moon in accordance with the calculations and programme, and took photographs of the Moon's disc, not visible from the Earth. The images of the Moon have been transmitted from the interplanetary station after receiving commands from Earth over hundreds of thousands of kilometres.

A new era in the history of astronomy has begun - now it is possible to obtain photographic images of the planets from a close distance as well as to study the physical parameters of space as well as radiation from celestial objects without the interference present near the Earth's surface. Now astronomers don't have to wait for 15 - 17 years, until the distance between Mars and Earth will shorten to 50 - 60 million kilometers. It is now possible to deliver equipment close to the planets to perform imaging of their surfaces. The Soviet people have broken the chains of planet Earth, and interplanetary flights have become a reality for modern generations.

Nikita Khrushchev, addressing the III Session of the USSR Supreme Soviet said: "We are proud of the achievements made by Soviet people in space exploration, proud of three successful launching of space rockets during one year. The Soviet people glorify those, who have paved the way into space."

There were many great discoveries in the field of natural science since the time of Galileo and Newton; for example, discovery of new planets in the Solar system - Neptune and Pluto. But only now have the first artificial satellites been created by the Soviet people, the first in the history of humankind, to achieve flight between two celestial objects. The launch of first Soviet artificial satellites and space rockets have produced many world-class discoveries, such as the radiation belt and new data on the Earth's magnetic field; the absence of a strong magnetic field and of a radiation belt around the Moon; the density of interplanetary gas has been determined; and the first photographs of the far side of the Moon have been obtained.



Preliminary results of studying the images received from an automatic interplanetary station are published in this book. In the near future, the USSR Academy of Sciences will publish scientific papers, containing the images, describing geographical features on the far side of the Moon, and presenting methods of studying these features and other data.

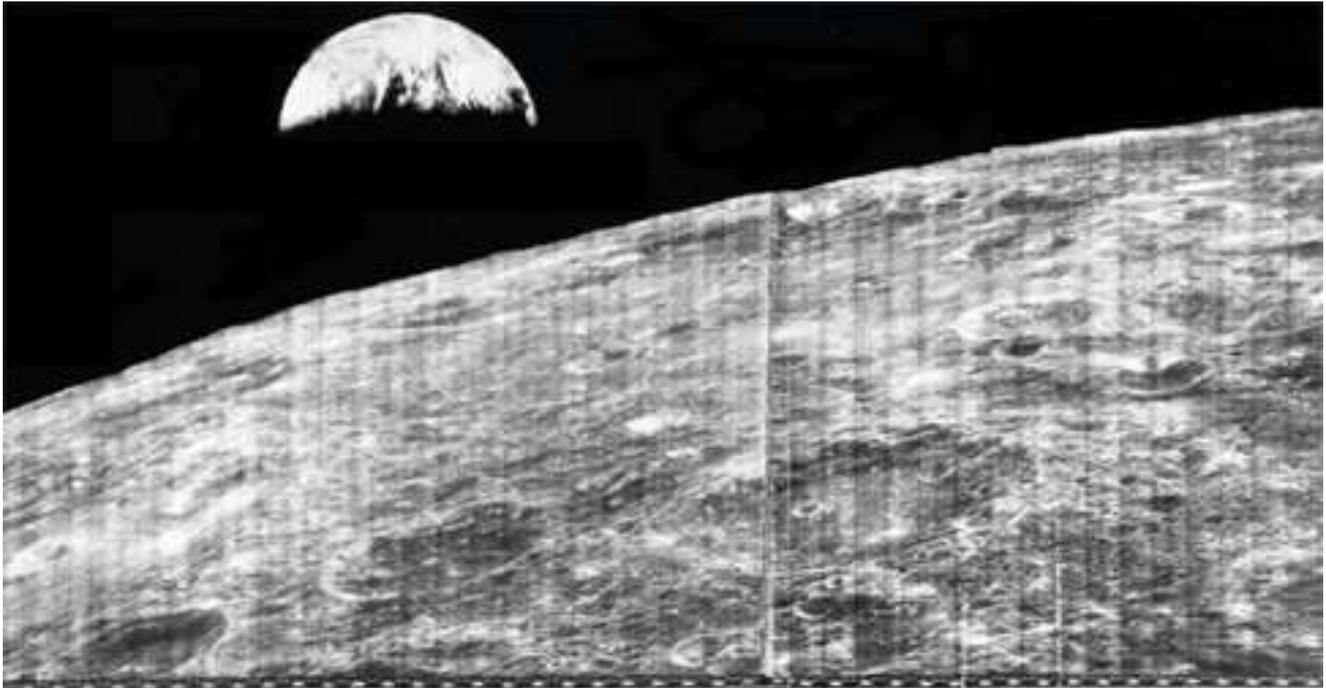
The scientists of the Soviet Union hope that the published information about photographing the Moon's far side will promote the progress of science in the field of study of the Universe.

*A.N. Nesmeyanov*  
*President*  
*USSR Academy of Science*

## one of the greatest photographs of the 20<sup>th</sup> century

edited article by Michael Lombardi

A picture taken 40 years ago, was hailed at that time as the greatest photograph of the 20<sup>th</sup> century. It took three days and 232,000 miles to get the camera in the right position with results that were absolutely stunning; It was the first-ever photograph of Earth taken with the Moon in the foreground.



The photo was the first of many spectacular images taken by the five unmanned space vehicles, called Lunar Orbiters. The mission heralded the most successful space program then launched, and marked Boeing's first foray into space.

The primary mission of Lunar Orbiter was to obtain photographs of the Moon's surface that would aid in the selection of suitable landing sites for the Apollo manned expeditions. Lunar Orbiter also had secondary objectives that included the collection of data on the Moon's gravitational field, levels of radiation and micrometeorite density in the vicinity of the Moon.

The Lunar Orbiter Project Office at NASA's Langley Research Center recommended that Boeing, along with its subcontractors Eastman Kodak and RCA, build the Lunar Orbiters. A final contract for eight orbiters (three test and five flight vehicles) was signed on May 7, 1964. Although Boeing came in with the highest bid, the company had many factors in its favor. Among them:

- A reputation for project organization and success built on a number of prior programs.
- A design that used proven off-the-shelf hardware (in particular, the Kodak photographic system, a lightweight version of one developed for use on U.S. Air Force reconnaissance satellites).
- Its own on-site test facilities.

The Lunar Orbiters were built at the Boeing Missile Production Center, in Seattle. Testing took place there and at the space environment test chamber at the then-new Boeing Space Center in nearby Kent, Washington. The Lunar Orbiter was an 850-pound structure that measured 5 feet wide and 5 feet, 6 inches tall in its launch configuration. With its four solar panels and two antenna booms deployed, it measured 18 feet 6 inches wide.

The launch of Lunar Orbiter I on August 10, 1966, aboard an Atlas-Agena D booster was Boeing's entry into the space age. So successful was the program that Orbiters I, II, and, III fulfilled the program's original mission objectives, which allowed the last two Orbiters to be devoted to broader scientific studies of the Moon.

Unlike the first three missions, Orbiters IV and V were placed into near-polar orbits. They performed broad photographic surveys of the lunar surface, photographing 99 percent of the Moon's near side and 80 percent of the Moon's far side with a resolution 10 times greater than what could be achieved by any earth-based telescope. To this day, the photographs taken by the five Lunar Orbiters have provided the basis for all accurate maps of the Moon.

The Lunar Orbiters paved the way for man's first steps on the Moon by giving the Apollo project valuable data about the Moon and its environment. They helped with landing site selection and verification. They also gave Apollo flight operations experience in tracking spacecraft in lunar orbit and saved NASA valuable time and money. The alternative to sending the orbiters had been a manned Apollo mission to lunar orbit. That single mission would have been considerably more expensive than the entire Lunar Orbiter program and probably would have forced Apollo to miss the goal proposed by President Kennedy for a manned landing on the Moon before the end of the decade.



## hubble fix is a 'go'

edited article by Irene Klotz

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NASA has announced, as of 31 October 2006, that Space shuttle astronauts will make one last servicing call to the Hubble Space Telescope, buoying hopes the world's premier observatory will continue its cutting-edge research programs through at least 2013.

The fifth house call to Hubble had been cancelled following the 2003 Columbia disaster, when NASA deemed any mission that did not fly to the International Space Station (which could serve as an emergency shelter in case of Columbia-like shuttle damage) was too risky to fly. NASA briefly investigated a robotic servicing flight to the 16-year-old observatory but found the mission too complex, costly, and time-consuming to develop and fly. Congress ordered NASA to reconsider its decision and set aside funds to continue preparing equipment and personnel for the flight. NASA Administrator Mike Griffin pledged a new review after the shuttle demonstrated post-Columbia safety upgrades and procedures.

Before a packed auditorium at the Goddard Space Flight Center in Greenbelt, Maryland, which oversees the telescope, Griffin announced the shuttle was cleared for a final flight to Hubble. "We are going to add a shuttle servicing mission to the Hubble Space Telescope to the shuttle's manifest to be flown before it retires [in 2010]," Griffin said, spurring loud cheers, hearty applause, and a standing ovation.

The mission, targeted for launch in early May 2008, will involve up to five spacewalks to install two new science instruments, repair a third instrument, replace spent batteries, and swap out six gyroscopes, which are used for positioning the observatory. Without an upgrade, the telescope is expected to last only another 2 to 3 years.



In approving the flight, NASA also decided to have a second shuttle at the launch pad ready to fly a rescue mission in case the ship carrying the Hubble repair crew sustains Columbia-like damage. Since 2003, NASA has twice redesigned the shuttle's fuel tank, which caused

the problem that led to Columbia's demise, and also developed techniques to inspect the shuttle during flight for damage and make rudimentary repairs.

"The safety of our crew conducting this mission will be as much as we could possibly do," Griffin said. Crew members assigned to the flight are Commander Scott Altman, Pilot Gregory Johnson, Robot-arm Operator Megan McArthur, and Spacewalkers John Grunsfeld, Michael Massimino, Andrew Feustel, and Michael Good.

Johnson, McArthur, Feustel, and Good will be making their first spaceflights.

During the servicing flight, astronauts will replace Hubble's wide-field planetary camera with an updated imager sensitive to a broader range of wavelengths from the near-ultraviolet to the near-infrared. Astronomers plan to repeat in infrared Hubble's famed ultra-deep-field image, a million-second long exposure that revealed the universe's first galaxies.

"We should be able to see the first galaxies 400 million years after the Big Bang," said senior project scientist David Leckrone. "It's an incredibly mysterious period when all the action happened, when matter started coming together."

The camera is also expected to play a key role in the search for extremely distant supernovae, which are used to track so-called dark energy believed to be driving the universe's expansion.

The second major upgrade will be the installation of an extremely sensitive light-splitting spectrograph that will look at light from distant quasars to chart the universe's first structures.



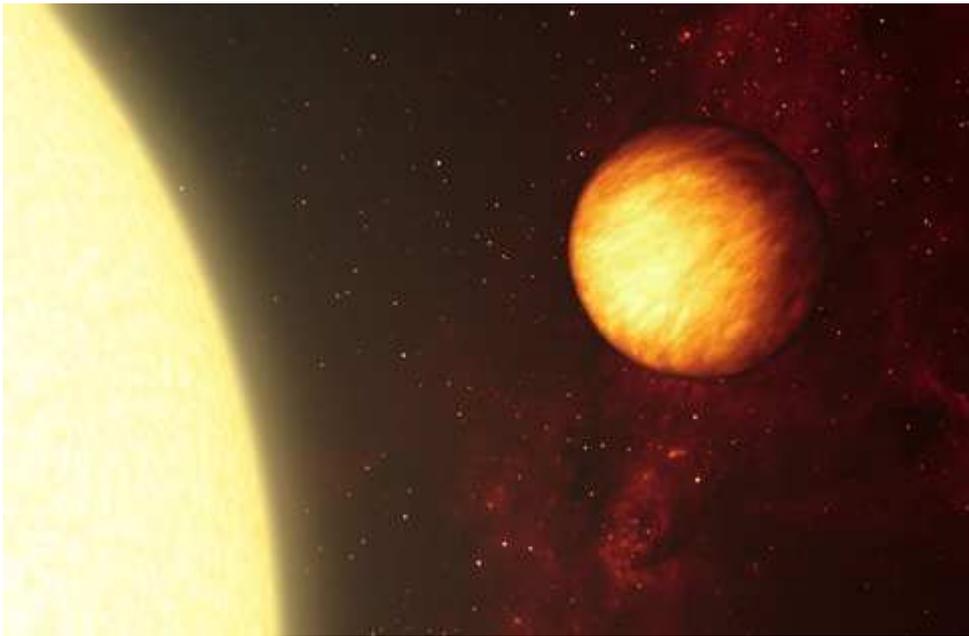
## diurnally locked exoplanet

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edited article by Laura Layton

Planetary scientists Joseph Harrington and Brad M. Hansen are the first to directly measure an extrasolar planet's day and night temperatures. The scientists and their team used NASA's Spitzer Space Telescope's Multiband Imaging Photometer (MIPS) to measure infrared light emitted from exoplanet, *Upsilon Andromedae b*, at five points in its 4.6-day orbit in February.

A team led by Geoffrey Marcy and Paul Butler discovered *Ups. And. b* orbiting a star 40 light-years distant in the constellation Andromeda in 1996 using the radial-velocity method. The exoplanet is dubbed a "hot Jupiter" because it orbits close to its host star at 0.059 AU (1 AU is the average Earth-Sun distance) and contains at least 0.69 Jupiter-masses. "As the planet orbits, the system gets slightly brighter and dimmer. That difference tells us the planet has a hot side and a cold side," says Harrington. Hot and cold correlate to day and night, respectively, on the tidally locked planet. The exoplanet's temperature pattern matches its known orbit.



*Ups. And. b* absorbs and reradiates energy as it orbits its host star. "Theoretical predictions suggest the hottest point on such a planet would be blown downstream by winds as strong as 6,700 miles per hour," Harrington says.

However, observations show something different. "Winds cool off before carrying much heat from the exoplanet's day side to its night side."

The scientists did not expect to observe the planet's fast cooling. This is not the case for gas-giant planets in our solar system, which do transport energy from their day sides to their night sides. Observations show *Ups. And. b* also cools off much faster than gas-giant planets in our solar system. And, for the first time, "We're studying the weather on a planet outside our solar system," says Harrington. Results appear in the online journal *Science Express* October 12.

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## pale blue dot II

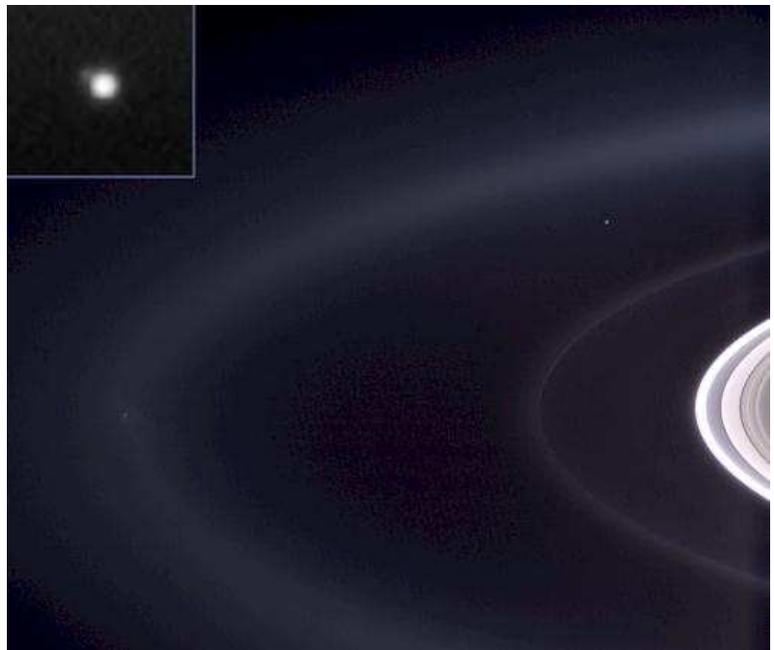
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edited NASA press release

Not since NASA's Voyager 1 spacecraft saw our home as a pale blue dot from beyond the orbit of Neptune has Earth been imaged in colour from the outer solar system. Now, Cassini casts powerful eyes on our home planet, and captures Earth, a pale blue orb – and a faint suggestion of our moon – among the glories of the Saturnian system.

Earth is captured here in a natural colour portrait made possible by the passing of Saturn directly in front of the Sun from Cassini's point of view. At the distance of Saturn's orbit, Earth is too narrowly separated from the Sun for the spacecraft to safely point its cameras and other instruments toward its birthplace without protection from the Sun's glare.

The Earth-moon system is visible as a bright blue point on the right side of the image above centre. Here, Cassini is looking down on the Atlantic Ocean and the western coast of north Africa. The phase angle of Earth, seen from Cassini, is about 30 degrees. A magnified view of the image taken through the clear filter (monochrome) shows the moon as a dim protrusion to the upper left of Earth.



Earth no longer holds the distinction of being our solar system's only water world, as several other bodies

suggest the possibility that they too harbour liquid water beneath their surfaces. The Saturnian moon, Enceladus, is among them, and is also captured through the rings in this image, with its plume of water ice particles and swathed in the blue E ring which it creates. Delicate fingers of material extend from the active moon into the E ring. The narrow tenuous G ring and the main rings are seen at the right.

The view looks down from about 15 degrees above the plane of the rings.

Images taken using red, green and blue spectral filters were combined to create this view. The image was taken by the Cassini spacecraft's wide-angle camera on Sept. 15, 2006, at a distance of approximately 2.1 million kilometers (1.3 million miles) from Saturn and at a sun-Saturn-spacecraft angle of almost 179 degrees. Image scale of the rings is about 129 kilometers (80 miles) per pixel.

## do we really know what killed the dinos?

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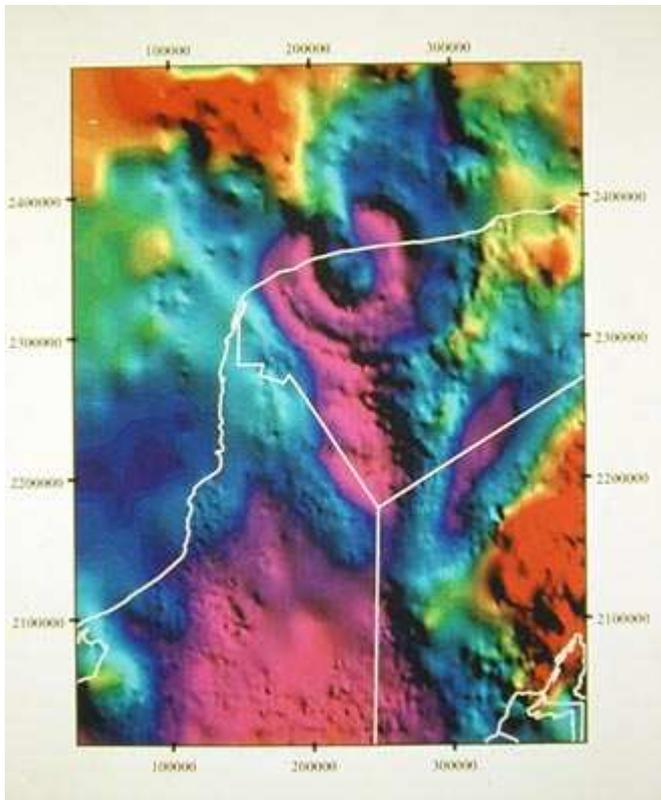
edited Geological Society of America article

There's growing evidence that the dinosaurs and most of their contemporaries were not wiped out by the famed Chicxulub meteorite impact. The Chicxulub impact may, in fact, have been the lesser and earlier of a series of meteorites and volcanic eruptions that pounded life on Earth for more than 500,000 years, say Princeton University paleontologist Gerta Keller and her collaborators.

A final, much larger and still unidentified impact 65.5 million years ago appears to have been the last straw, exterminating two thirds of all species in the largest known mass extinction event in history. It's that impact, not Chicxulub, which left the famous extraterrestrial iridium layer found in rocks worldwide that marks the impact that finally ended the Age of Reptiles.

"The Chicxulub impact could not have caused the mass extinction," says Keller, "because this impact predates the mass extinction and apparently didn't cause any extinctions."

Marine sediments drilled from the Chicxulub crater itself, as well as from a site in Texas along the Brazos River, and from outcrops in northeastern Mexico reveal that Chicxulub hit Earth 300,000 years before the mass extinction. Small marine animal microfossils were left virtually unscathed.



In all these localities we can analyze the marine microfossils in the sediments directly above and below the Chicxulub impact layer and cannot find any significant biotic effect. We cannot attribute any specific extinctions to this impact and no one has ever published this critical survival story before, she said.

The story that seems to be taking shape is that Chicxulub, though violent, actually conspired with the prolonged and gigantic eruptions of the Deccan Flood Basalts in India, as well as with climate change, to nudge species towards the brink. They were then shoved over with a second large impact.

The Deccan volcanism did the nudging by releasing vast amount of greenhouse gases into the atmosphere over a period of more than a million years leading up to the mass extinction. By the time Chicxulub struck, the oceans were already 3-4 degrees warmer.

"On land it must have been 7-8 degrees warmer," says Keller. "This greenhouse warming is well documented. The temperature rise was rapid, over about 20,000 years, and it stayed warm for about 100,000 years, then cooled back to normal well before the mass extinction."

Marine species at the time suffered from the heat. Most adapted to the stress conditions by dwarfing, growing less than half their normal size and reproducing rapidly with many offspring to increase the chances for survival. The Chicxulub impact coincided with this time. By the time the climate cooled back to normal, most tropical species were on the brink of extinction. Then the second large impact hit and pushed them over the brink – many straight to extinction.

As for how the dinosaurs were affected, that's a bit harder to say specifically, since dinosaurs did not leave a lot of fossils behind to tell the tale.

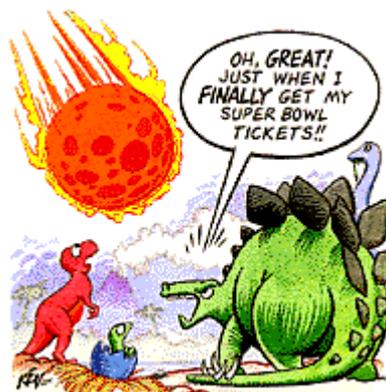
"Dinosaur fossils are few and far between," Keller said. "People love the dinosaurs but we can only really study what happened to them by looking at microfossils because these little critters are everywhere at all times. In just a pinch of sediment we can tell you the age, the prevailing climate, the environment in which it was deposited and what happened. It's remarkable."

What the microfossils are saying is that Chicxulub probably aided the demise of the dinosaurs, but so did Deccan trap volcanism's greenhouse warming effect and finally a second huge impact that finished them off.

So where's the crater?

"I wish I knew," said Keller. "There is some evidence that it may have hit in India, where a crater of about 500 kilometers in diameter is estimated and named Shiva by paleontologist Sankar Chatterjee from the Museum of Texas Tech University in Lubbock. The evidence for it, however, is not very compelling at this time."

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## canopus gallery

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see front cover, photograph by Bert van Winsen

<p>NGC 7293 (The Helix Nebula) Distance: 694 Light Years Right Ascension: 22 : 29.6 (hours : minutes) Declination: -20 : 48 (degrees : minutes)</p>
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NGC 7293 represents the nearest planetary nebula to our Sun. The remnants of a dying star, the Helix is actually a series of ring-like structures which extend outward and represent gases released during different phases of the star's death.

The main ring of the nebula which is visible in optical images is actually composed of inner and outer ellipsoidal shaped rings which are inclined almost perpendicular to each other. The innermost ring has a diameter of 1.7 light years and is the youngest component expelled some 6560 years ago. It is surrounded by a toroidal shaped outer ring with a diameter of 2.5 light years and is twice the age of the inner component at 12,100 years.

Plumes arise from the outer ring in its northwest and southeast aspects. An extreme outer arc exists with a diameter of 5.7 light years and probably represents recently ionized gas released much earlier during the star's Red Giant phase. Double and rotationally symmetric structures are common in planetary nebulae but how they occur is a mystery. The different time scales of the inner and outer ring components suggest a rapid change of axis of the nebula in a short period of about 5500 years.

The inner ring of the nebula shows a series of radially arranged cometary knots that exist in a ring several trillion miles from the central hot star. Cometary knots are a phenomenon seen in other Planetary Nebulae. The knots, each several billion miles across (several times the size of our solar system), have comet shaped tails each 100 billion miles long which point towards the central star.

The cometary structures are thought to be the result of a collision of two expanding gas fronts having different temperatures and densities. The collision causes the gaseous mixture to become unstable due to Rayleigh-Taylor instability resulting in the fragmentation and condensation of the gas into large droplets which we see as the "comet heads".

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Excerpt taken from:

O'Dell, C.R., McCullough, P.R. & Meixner, M. (2004), *The Astronomical Journal*, **128**, 2339-2356

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## canopus classifieds

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### To the Highest Bidder:

Partially assembled Cook Book Astronomical CCD Camera, based on the Texas Instruments TC245 CCD chip, donated to the ASSA Jhb. Centre from the estate of the late Dr G. E. B. Tremeer. Highest written offer received up to the time when this item is dealt with at the January monthly meeting on the evening of Wed 10<sup>th</sup> January 2007 secures.

**For sale as a single lot, without reserve, voetstoots.**

Note: This is not a “plug & play” kit. It will require the talents of a knowledgeable amateur and the sourcing of some components given in the parts list. The Cook Book Astronomical CCD Camera came on to the market in 1994. Today, this kit might only be good for parts.

A current Internet price for a low end CCD deep sky imager is US\$299-00 plus shipping.

The kit and instruction manual can be inspected at the ASSA Jhb. Centre library after 6 PM on Wed. 10th Jan 07, or sooner by arrangement with the librarian, Alec Jamieson, who can also provide more technical details by e-mail.

Up to the 9<sup>th</sup> January 2007, offers may be sent by e-mail to the librarian who will not be making an offer for this lot. Bids will be kept confidential until the monthly meeting on 10<sup>th</sup> January 2007.

Alec Jamieson,  
Librarian,  
ASSA Jhb. Centre.  
arjam@iafrica.com  
082 654 5336



## astro-surfing the `net

While surfing the net recently I came upon this sound advice on one site:

### Alien Mind Transmissions

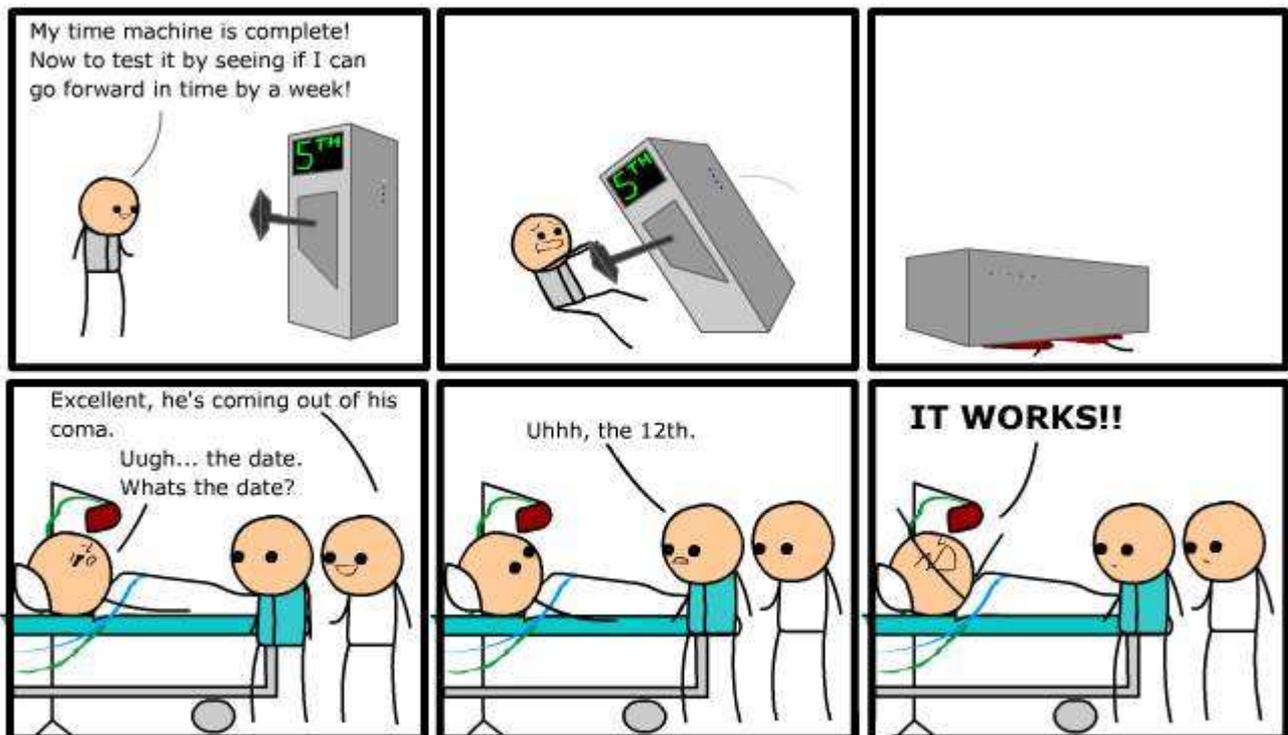
When citing telepathic transmissions from alien planets/spacecraft:

- ✓ Name the aliens who sent the message (if known).
- ✓ Identify the location of planet or craft.
- ✓ Identify the location where transmission was received.
- ✓ List the date the transmission was received.

- You must agree that if everybody made notes of the above details every time they encountered an alien spacecraft it would make things a lot easier for astrophysicists to understand these transmissions.
- Not only should you note the location of the craft but you need to make a note of the model and year of manufacture. You can usually get these details off the license disk or number plate for vehicles from the Virgo cluster. Getting the year of manufacture and engine capacity will enable air traffic controllers to get an idea on the distance to the home planet and hence a clue as to the landing fees to be charged.
- But then if you are telepathic, you would have known these things already.

Keep the airwaves clear.

Brian Fraser



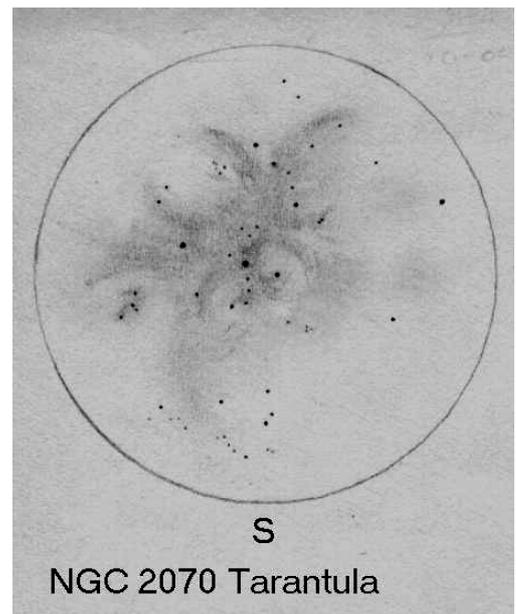
## one splendid deep sky object – tarantula nebula

Magda Streicher

The Large Magellanic Cloud is comfortably nestled in the Southern Hemisphere and is home to NGC 2070, a great looped nebula, which is probably one of the most amazing objects in the night sky. Also known as 30 Doradus, it is situated approximately 190 000 light years from earth, and is almost 600 to 700 light years in diameter. Some astronomers believe that 30 Doradus is the nucleus of this neighbouring galaxy, but on the other hand it is not very centrally placed. The inner core consists of stars very hot and large, and their combined radiation is responsible for its brilliance. The Tarantula nebula is named just that due to the striking similarity it shows to the tarantula spider of Australia, the largest arachnid of its sort in the world.

The Tarantula nebula can be described by more than a hundred words and still more could be said about this magnificent object. Many words sing a song to describe the Tarantula nebula, and I can just try to share my humble description;

My first impression was one of awe; a very large gas nebula unfolds in lengthy soft cloud-like arms, gently enfolds with dark stripy inlays from a soft but strong inner part. (12" S/C – 95x). With higher power the inner part displays a tight, bright overwhelming core (12" S/C – 218x). Soft nebulous gas trails and filaments extend beautifully in soft streaks of light that fade away and mingle with the dark of night. The southern part of the nebula is more complex, which unfolds in a veil of misty haziness. The northern part seems tighter and more defined and with a bit of imagination it looks like the nose of this spider nebula. Star splinters dot the surface of this outstanding object like dew drops on frosted glass.



I normally shift from this wondrous nebula to the small star cluster NGC 2060, and further south to NGC 2044 from where I star hop to the position of Supernova 1987A, the titanic supernova explosion on 23 February 1987. It blazed with the power of 100,000,000 suns for several months following its discovery and brightened up more than 2000 times. Although the supernova itself is now a million times fainter than 19 years ago, a new source of light now shows up in the surrounding space. I sketched this area to monitor the spot where hopefully I will one day be able to observe its outcry (346x).

Object	Other names	Type	RA	Dec	Mag	Size
NGC 2070	30 Doradus	Newel/C	05.38.6	-69°05	5	40'

# the sky this month

site location: lat. **26.0 deg S** long. **28.0 deg E** local time – UT = **+2.0 hrs.**

## december 2006

dd hh		dd hh		
2 00	Moon at perigee	18 15	Pluto at conjunction	
5 01	FULL MOON	18 20	Jupiter 5.5N of Moon	
6 20	Saturn stationary	19 03	Mars 4.7N of Moon	
7 24	Pollux 2.4N of Moon	19 04	Antares 0.3N of Moon	Occn
10 03	Mercury 1.0N of Mars	19 18	Mercury 4.7N of Moon	
10 12	Saturn 1.1S of Moon	20 02	Mars 4.4N of Antares	
10 17	Mercury 0.1N of Jupiter	20 15	NEW MOON	
10 22	Regulus 1.3S of Moon	21 17	Venus 3.5N of Moon	
11 16	Mars 0.8S of Jupiter	22 01	Solstice	
12 15	LAST QUARTER	24 05	Neptune 2.4N of Moon	
13 19	Moon at apogee	25 22	Uranus 0.0N of Moon	Occn
14 20	Mercury 4.9N of Antares	27 15	FIRST QUARTER	
15 11	Spica 0.7N of Moon	28 02	Moon at perigee	

## january 2007

dd hh		dd hh		
3 14	FULL MOON	17 03	Mars 4.5N of Moon	
3 20	Earth at perihelion	19 03	Venus 1.3S of Neptune	
4 09	Pollux 2.6N of Moon	19 05	NEW MOON	
6 19	Saturn 0.9S of Moon	19 20	Mercury 1.2N of Moon	Occn
7 06	Mercury superior conjunction	20 15	Neptune 2.2N of Moon	
7 07	Regulus 1.1S of Moon	20 18	Venus 0.7N of Moon	Occn
9 07	Jupiter 5.3N of Antares	22 06	Uranus 0.3S of Moon	Occn
10 16	Moon at apogee	22 12	Moon at perigee	
11 13	LAST QUARTER	25 24	FIRST QUARTER	
11 19	Spica 0.9N of Moon	26 14	Mercury 1.3S of Neptune	
15 14	Antares 0.5N of Moon	31 17	Pollux 2.6N of Moon	
15 16	Jupiter 5.7N of Moon			

## local times of rise and set for the major planets

Date	Sun		Mercury		Venus		Mars		Jupiter		Saturn	
	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set
<b>Dec 7</b>	5.09	18.53	4.11	17.33	5.50	19.38	4.15	17.46	4.26	17.56	23.22	10.32
<b>Dec 17</b>	5.12	18.59	4.25	18.05	6.05	19.54	4.02	17.40	3.55	17.26	22.42	9.52
<b>Dec 27</b>	5.17	19.04	4.47	18.38	6.23	20.07	3.51	17.33	3.23	16.56	22.02	9.11
<b>Jan 1</b>	4.51	19.23	4.30	19.12	6.04	20.28	3.17	17.47	2.45	17.00	21.53	8.36
<b>Jan 11</b>	4.59	19.24	5.06	19.39	6.26	20.32	3.07	17.42	2.13	16.30	21.12	7.53
<b>Jan 21</b>	5.09	19.21	5.51	19.58	6.49	20.31	2.59	17.35	1.40	16.00	20.30	7.11
<b>Jan 31</b>	5.20	19.15	6.36	20.04	7.11	20.26	2.53	17.27	1.08	15.28	19.49	6.27