
June 2008

## Inside this Issue



S*T*A*R
P.O. Box 863
Red Bank, NJ 07701
On the web at:
http://www.starastronomy.org

Edited by: Ahmad & Hanna Jrad

## June's Meeting

The next meeting of S*T*A*R will be on Thursday, June 5. This is the annual club meeting where new officers are elected. All are welcome.
The meeting will begin promptly at 8:00pm at the King of Kings Lutheran Church, 250 Harmony Road, Middletown. For details contact Rich Gaynor at richg870@aol.com or 732-671-3756.

## Editor's Corner

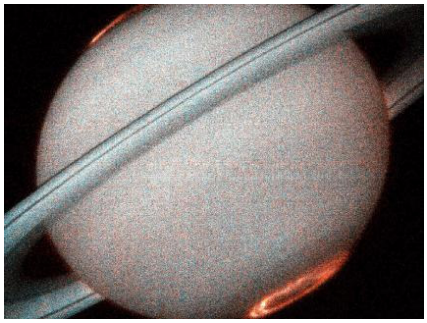
Thanks to Gavin Warnes, Steve Fedor, Ernie Rossi & Randy Walton for sending articles to this month's Spectrogram.

Reminder to pay membership dues $25/individual, $35/family. Donations are appreciated. Make payments to Paul Nadolny at the June meeting or mail a check payable to S*T*A*R Astronomy Society Inc to:

**S*T*A*R Astronomy Society**
**P.O. Box 863**
**Red Bank, NJ 07701**

## June Issue

**Please send articles and contributions by Fri. August 22**. stargaze07@verizon.net.



Saturn was 810 million miles (1.3 billion kilometers) away when the Hubble Space Telescope took this ultraviolet image of the planet, revealing a vivid auroral display rising thousands of miles above the cloud tops over both of the planet's poles.

### Calendar

Sep 6, 2007 – "***NASA's Deep Impact Mission***" by Elizabeth Warner, University of Maryland

Oct 4, 2007 – ***" Webcam Astrophotography"*** by Clif Ashcraft

Nov 1, 2007 – ***"The Interstellar Medium"*** by Dr Hector Arce, American Museum of Natural History

Dec 6, 2007 – ***"Adventures at Palomar"*** by Alan Midkiff

Jan 3, 2008 - ***"NASA's Dawn Mission"*** by Dennis O'Leary, S*T*A*R Astronomy

Feb 7, 2008 - ***"Moons of the Solar System"*** by David Britz, S*T*A*R Astronomy

Mar 6, 2008 - ***"Remote Control CCD Imaging "*** by Steve Walters, S*T*A*R

Apr 3, 2008 – ***"Our Changing Sun"*** by Ken Legal, S*T*A*R

May 1, 2008 – "***The Near Side Lunar Megabasin***" by Charlie Byrne, S*T*A*R

Jun 5, 2008 – AGM

### Announcements:

**7/31-8/3 - Stellafane** Springfield, VT.
http://www.stellafane.com
**8/9-12–Spruce Knob Star Party** Spruce Knob, WV
http://www.ahsp.org/
**8/29-31 – The Conjunction** Northfield, MA
http://www.philharrington.net/astroconjunction/
**9/5-7– Black Forest Star Party** Cherry Springs State Park, PA
http://www.bfsp.org/starparty/index.cfm
**Charles Byrne Web Site** some members asked about this site:
http://www.imageagain.com

# President's Corner

*By Gavin Warnes*

This has been a great year for our astronomy club. We've seen our membership grow from 52 to approximately 70 this year (Paul will have the final figures at the annual business meeting on June 5th). I'd like to wish warm welcome to everybody who has joined this year and hope that you have many fun years with the astronomy bug. Thanks to everybody who has helped with recruitment activities, especially our Outreach Chairman Rich Gaynor.

Many of you may have heard about a new Microsoft initiative, the Worldwide Telescope. This is a free piece of software that lets you explore the night sky and renders images in 3D. You need a fairly recent and powerful PC to run it. Fortunately Rich Solomon has just that and has volunteered to give us a demonstration at the June meeting. You can check out the program at www.worldwidetelescope.org. If you don't have a souped up computer you can still enjoy Google Sky at http://www.google.com/sky/.

Last month John Heidema, Doug Berger and I paid a visit to Scopehead (Stephen Scaravella) at his new home in Richmond, Vermont. Stephen has a fantastic sky to observe from a large piece of property. When Stephen next issues an invitation I encourage you to take him up on his offer! Breakfast downtown is great too. The night Doug and I observed it was very hazy. Visual observing was not good, but fortunately I had brought the Stellacam 2 that Ernie bought used for me. We had a great couple of hours punching through the haze using the camera in Scopehead's SCT. We will have the same setup for use after the June meeting, thanks to Dennis for use of his 11" Celestron. Hopefully it will be clear and we can all see the spiral arms of M51.

It was exciting for follow the coverage of the landing of Phoenix on Mars on Sunday 25th. Everything went perfectly! For those of you who missed it I have a recording of the 'seven minutes of peril' that we can watch at the meeting.

Hopefully I've given you three good reasons to come to the annual business meeting. We will be voting on whether the club should be move to Monmouth Museum or not and our usual items. These include election of board members for next year the candidates for which are as follows:

President - Gavin Warnes
Vice President - Dennis O'Leary
Secretary - Steve Fedor
Treasurer - Rob Nunn
Member at Large - two candidates (vote for one): Jay Respler or Dan Pontone

Please remember that our Bylaws prohibit absentee and proxy voting, so to vote, you must come to the meeting. Thanks to Frank Loso for being the nominating committee of one this year!

Last year we had our biggest ever picnic. Let's have another one this year! To do this we need volunteers to organize the event, buy supplies and cook. Last year we did this with a team of five. We need some volunteers for this year please! If you would like to help out, please volunteer at the June meeting or email me at gavin.warnes@gmail.com.

I've started working on the program of speakers for next year. It was great to have so many members of the club talk this year. If you'd like to follow in their footsteps and give a presentation, please send me an email.

Clear skies!

Gavin

# March Meeting Minutes

*By Steve Fedor*

The May 2008 meeting of S*T*A*R Astronomy Club began at 8:05 on May 1. The meeting was attended by about 30 people. Vice-president Dennis O'Leary chaired the meeting, and welcomed first-time attendee Herb Johnson. Dennis noted that at next month's meeting the club will elect a new slate of officers, and encouraged those interested in running for office to contact Frank Loso.

Dennis then introduced the speaker for the night, club member Charles Byrne, who spoke on research he has conducted on lunar impacts that have produced the surface features that we observe. The title of the talk was "Near Side Megabasin of the Moon." Charles began the talk by noting that the moon is believed to have been formed from a collision of an object with the earth, and describing the moon's resulting interior structure. He then explained that data from a number of techniques, including photographic, gravitational, and chemical, show an asymmetry in the moons crust, with a thin side facing the earth, and a bulge on the far side. He showed results of numerical calculations that predict the effect of an impact, and images of craters that display the predicted structure. His research has attempted to deduce from the large-scale features of the moon a set of impacts that would have produced the observed features. By testing a number of hypotheses, he has concluded that the asymmetry can be explained by a single event that produced the enormous basin facing the earth. The basin exhibits the features that we interpret as the "man in the moon". The slides Charles showed are from his second book describing lunar features. Information about his research is available on the web site www.imageagain.com.

Following the talk, Ken Legal presented the objects of the month. The beginner's object is the coma star cluster, whose size is five degrees, and is thus best viewed with binoculars. The challenge object is the needle galaxy, NGC 4565, which we see as an edge-on galaxy of magnitude 9.5.

After a break from 9:05 to 9:30 Dennis noted that the touchdown of the Mars Phoenix Lander on May 25th will be televised, and suggested that club members interested in gathering to watch the telecast could post meeting proposals on the discussion board. Dennis reported that the April meeting at Monmouth Museum was attended by a large group, about 60 people, which resulted in somewhat cramped seating. He said that with some exceptions the club would be able to use the large gallery for meetings, and that it would have access to the kitchen. A vote on a proposal to move club meetings to the museum will be taken at the June meeting. Dennis reported that the solar viewing event at Bayonet Farm drew a substantial crowd, but that little viewing was possible because of cloudy skies.

In discussion of upcoming events, Dennis said that the Vonage Relay for Life fund raiser will take place from 3 pm on May 17 to dawn the following day. The club will have an area for solar viewing during the day and a star party after dark. He said a club picnic will be held again this summer, and volunteers are needed to select a date and organize the event. Information about the committee will be posted on the discussion board. Richard Gaynor said that five club members have offered to help with a star party for scouts that will take place May 12, and other members would be welcomed to assist.

The 50/50 drawing was won by Dennis, who becomes the fourth member of the board to win since September. Dennis donated his winnings to the club, adding a total of $24 to the club's account.

The meeting adjourned at 9:45.

# NASA's Phoenix Spacecraft Lands At Martian Arctic Site

*The University of Arizona is honored to be the first public university to lead a mission to Mars.*

*The Phoenix Mars Mission is the first in NASA's "Scout Program."*

May 25, 2008 -- NASA's Phoenix spacecraft landed in the northern polar region of Mars today to begin three months of examining a site chosen for its likelihood of having frozen water within reach of the lander's robotic arm.

Radio signals received at 4:53:44 p.m. Pacific Time (7:53:44 p.m. Eastern Time) confirmed the Phoenix Mars Lander had survived its difficult final descent and touchdown 15 minutes earlier. The signals took that long to travel from Mars to Earth at the speed of light.

Mission team members at NASA's Jet Propulsion Laboratory, Pasadena, Calif.; Lockheed Martin Space Systems, Denver; and the University of Arizona, Tucson, cheered confirmation of the landing and eagerly awaited further information from Phoenix later tonight.

Among those in the JPL control room was NASA Administrator Michael Griffin, who noted this was the first successful Mars landing without airbags since Viking 2 in 1976.

"For the first time in 32 years, and only the third time in history, a JPL team has carried out a soft landing on Mars," Griffin said. "I couldn't be happier to be here to witness this incredible achievement."

During its 422-million-mile flight from Earth to Mars after launching on Aug. 4, 2007, Phoenix relied on electricity from solar panels during the spacecraft's cruise stage. The cruise stage was jettisoned seven minutes before the lander, encased in a protective shell, entered the Martian atmosphere. Batteries provide electricity until the lander's own pair of solar arrays spread open.

"We've passed the hardest part and we're breathing again, but we still need to see that Phoenix has opened its solar arrays and begun generating power," said JPL's Barry Goldstein, the Phoenix project manager. If all goes well, engineers will learn the status of the solar arrays between 7 and 7:30 p.m. Pacific Time (10 and 10:30 p.m. Eastern Time) from a Phoenix transmission relayed via NASA's Mars Odyssey orbiter.

The team will also be watching for the Sunday night transmission to confirm that masts for the stereo camera and the weather station have swung to their vertical positions.

"What a thrilling landing! But the team is waiting impatiently for the next set of signals that will verify a healthy spacecraft," said Peter Smith of the University of Arizona, principal investigator for the Phoenix mission. "I can hardly contain my enthusiasm. The first landed images of the Martian polar terrain will set the stage for our mission."

Another critical deployment will be the first use of the 7.7-foot-long robotic arm on Phoenix, which will not be attempted for at least two days. Researchers will use the arm during future weeks to get samples of soil and ice into laboratory instruments on the lander deck.

The signal confirming that Phoenix had survived touchdown was relayed via Mars Odyssey and received on Earth at the Goldstone, Calif., antenna station of NASA's Deep Space Network.

Phoenix uses hardware from a spacecraft built for a 2001 launch that was canceled in response to the loss of a similar Mars spacecraft during a 1999 landing attempt. Researchers who proposed the Phoenix mission in 2002 saw the unused spacecraft as a resource for pursuing a new science opportunity. Earlier in 2002, Mars Odyssey discovered that plentiful water ice lies just beneath the surface throughout much of high-latitude Mars. NASA chose the Phoenix proposal over 24 other proposals to become the first endeavor in the Mars Scout program of competitively selected missions.

# Ozone, the Greenhouse Gas

We all know that ozone in the stratosphere blocks harmful ultraviolet sunlight, and perhaps some people know that ozone at the Earth's surface is itself harmful, damaging people's lungs and contributing to smog.

But did you know that ozone also acts as a potent greenhouse gas? At middle altitudes between the ground and the stratosphere, ozone captures heat much as carbon dioxide does.

In fact, pound for pound, ozone is about 3000 times stronger as a greenhouse gas than $CO_2$. So even though there's much less ozone at middle altitudes than $CO_2$, it still packs a considerable punch. Ozone traps up to one-third as much heat as the better known culprit in climate change.

Scientists now have an unprecedented view of this mid-altitude ozone thanks to an instrument aboard NASA's Aura satellite called the Tropospheric Emission Spectrometer—"TES" for short.

Most satellites can measure only the total amount of ozone in a vertical column of air. They can't distinguish between helpful ozone in the stratosphere, harmful ozone at the ground, and heat-trapping ozone in between. By looking sideways toward Earth's horizon, a few satellites have managed to probe the vertical distribution of ozone, but only to the bottom of the stratosphere.
Unlike the others, TES can measure the distribution of ozone all the way down to the heat-trapping middle altitudes. "We see vertical information in ozone that nobody else has measured before from space," says Annmarie Eldering, Deputy Principal Investigator for TES.

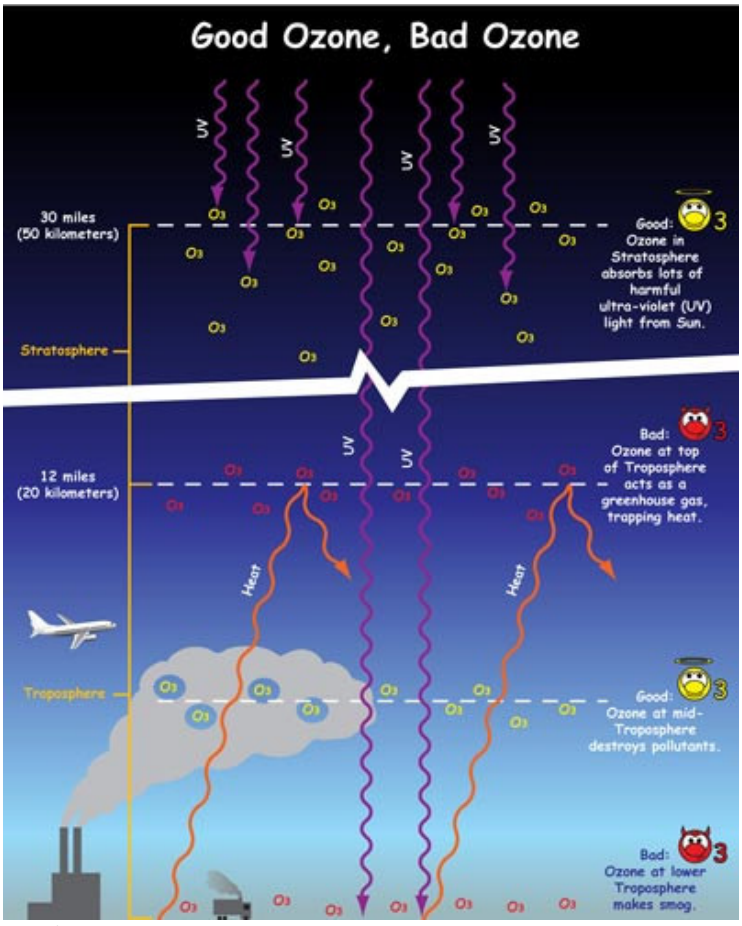
The global perspective offered by an orbiting satellite is especially important for ozone. Ozone is highly reactive. It is constantly being created and destroyed by photochemical reactions in the atmosphere and by lightning. So its concentration varies from region to region, from season to season, and as the wind blows.

Data from TES show that ozone's heat-trapping effect is greatest in the spring, when intensifying sunlight and warming temperatures fuel the reactions that generate ozone. Most of ozone's contribution to the greenhouse effect occurs within 45 degrees latitude from the equator.

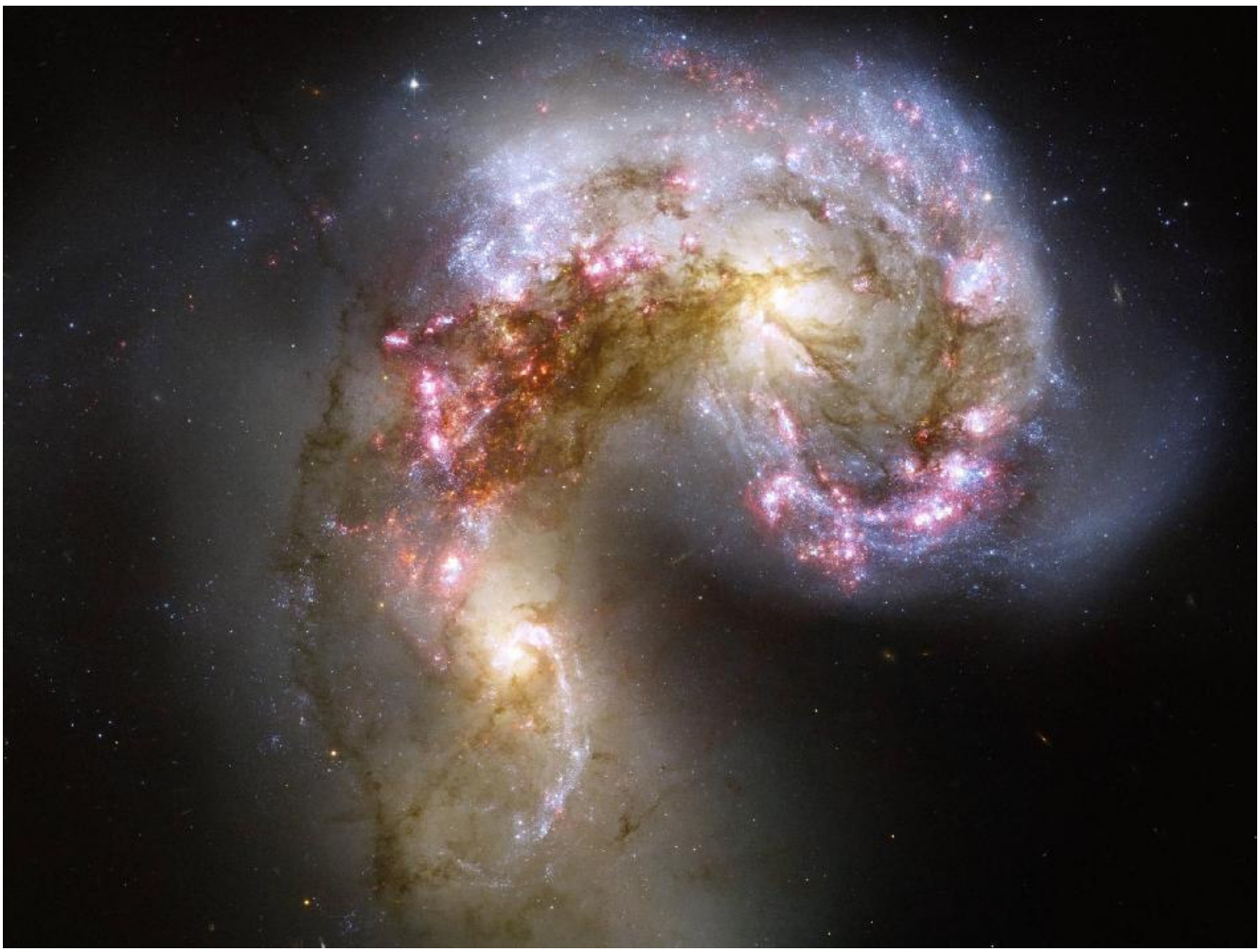
Increasing industrialization, particularly in the developing world, could lead to an increase in mid-altitude ozone, Eldering says. Cars and coal-fired power plants release air pollutants that later react to produce more ozone.

"There's concern that overall background levels are slowly increasing over time," Eldering says. TES will continue to monitor these trends, she says, keeping a careful eye on ozone, the greenhouse gas.
Learn more about TES and the science of ozone at tes.jpl.nasa.gov/. Kids can get a great introduction to good ozone and bad ozone at spaceplace.nasa.gov/en/kids/tes/gases.

*This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.*




Caption:
*Ozone behaves differently at different altitudes in the atmosphere. High in the stratosphere and at mid-troposphere it has positive effects on life at the surface. At the top of the troposphere ozone is a greenhouse gas and at the surface it makes smog.*



## Antennae Galaxies

This image of the Antennae galaxies is the sharpest yet of this merging pair of galaxies. During the course of the collision, billions of stars will be formed. The brightest and most compact of these star birth regions are called super star clusters.

The two spiral galaxies started to interact a few hundred million years ago, making the Antennae galaxies one of the nearest and youngest examples of a pair of colliding galaxies. Nearly half of the faint objects in the Antennae image are young clusters containing tens of thousands of stars. The orange blobs to the left and right of image center are the two cores of the original galaxies and consist mainly of old stars criss-crossed by filaments of dust, which appears brown in the image. The two galaxies are dotted with brilliant blue star-forming regions surrounded by glowing hydrogen gas, appearing in the image in pink.

The new image allows astronomers to better distinguish between the stars and super star clusters created in the collision of two spiral galaxies. By age dating the clusters in the image, astronomers find that only about 10 percent of the newly formed super star clusters in the Antennae will survive beyond the first 10 million years. The vast majority of the super star clusters formed during this interaction will disperse, with the individual stars becoming part of the smooth background of the galaxy. It is however believed that about a hundred of the most massive clusters will survive to form regular globular clusters, similar to the globular clusters found in our own Milky Way galaxy. The Antennae galaxies take their name from the long antenna-like "arms" extending far out from the nuclei of the two galaxies, best seen by ground-based telescopes. These "tidal tails" were formed during the initial encounter of the galaxies some 200 to 300 million years ago. They give us a preview of what may happen when our Milky Way galaxy collides with the neighboring Andromeda galaxy in several billion years.

Image Credit: NASA, ESA, and the Hubble Heritage Team (STScI/AURA)-ESA/Hubble Collaboration

# Are you a S*T*A*R Member?

S*T*A*R is the proud owner of a monstrous 25" Dobsonian Obsession reflector – which members can gain access to!

Meetings are the first Thursday of each month, except July and August, at 8:00 PM at the King of Kings Lutheran Church, 250 Harmony Rd. in Middletown. Meetings generally consist of lectures and discussion by members or guest speakers on a variety of interesting astronomical topics. S*T*A*R is a member of United Astronomy Clubs of New Jersey (UACNJ), the Astronomical League (AL), and the International Dark Sky Association (IDA).

Memberships: ( )Individual....$25 ( ) Family...$35

Name_____

Address_____

City_____State___Zip_____

Phone_____

Email_____

Make checks payable to: S*T*A*R Astronomy Society, Inc. and mail to P.O. Box 863, Red Bank, NJ 07701

# 2008 June Celestial Events

*Supplied by Ahmad Jrad for J. Randolph Walton (Randy)*

| **Day** | Date | **Time (EDT)** | **Event** |
|---|---|---|---|
| Tue | 3 | 15:23 | **New Moon** |
| | | 20:52 | Moon Set |
| Sat | 7 | 00:10 | Mars Sets |
| | | 00:55 | Saturn Sets |
| | | 05:31 | Sunrise |
| | | 09:37 | Moon Rise |
| | | 20:27 | Sunset |
| | | 22:40 | Jupiter Rises |
| Tue | 10 | 11:04 | **First Quarter Moon** |
| | | 13:03 | Moon Rise |
| Sat | 14 | 00:30 | Saturn Sets |
| | | 05:31 | Sunrise |
| | | 17:11 | Moon Rise |
| | | 20:30 | Sunset |
| | | 20:40 | Venus Sets |
| | | 22:05 | Jupiter Rises |
| | | 23:55 | Mars Sets |
| Wed | 18 | 13:30 | **Full Moon** |
| | | 20:59 | Moon Rise |
| Fri | 20 | 20:00 | **Summer Solstice** |
| Sat | 21 | 00:05 | Saturn Sets |
| | | 04:40 | Mercury Rises |
| | | 05:31 | Sunrise |
| | | 20:32 | Sunset |
| | | 20:50 | Venus Sets |
| | | 21:35 | Jupiter Rises |
| | | 22:51 | Moon Rise |
| | | 23:40 | Mars Sets |
| Sun | 22 | 22:41 | Double shadow transit on Jupiter |
| Thu | 26 | 08:10 | **Last Quarter Moon** |
| | | 13:26 | Moon Set |
| Sat | 28 | 04:25 | Mercury Rises |
| | | 05:34 | Sunrise |
| | | 15:52 | Moon Set |
| | | 20:33 | Sunset |
| | | 20:57 | Venus Sets |
| | | 21:10 | Jupiter Rises |
| | | 23:20 | Mars Sets |
| | | 23:40 | Saturn Sets |

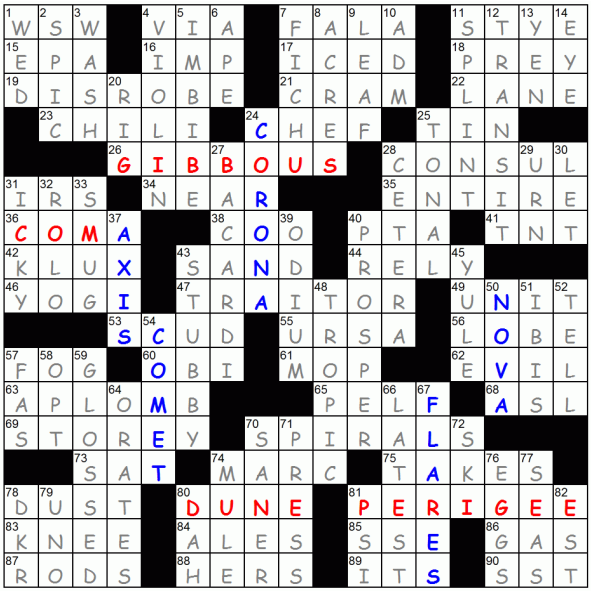
# In the Eyepiece

Here is a list of objects for this month. This is reproduced from www.skyhound.com with the kind permission of its creator and author of SkyTools Greg Crinklaw.

| Object(s) | Class | Con | RA | Dec | Mag |
|---|---|---|---|---|---|
| Izar | Multiple Star | Bootes | 14h44m59.2s | +27°04'27" | 2.4 |
| Xi Boo | Multiple Star | Bootes | 14h51m23.4s | +19°06'02" | 4.5 |
| 44 Boo | Multiple Star | Bootes | 15h03m47.4s | +47°39'15" | 4.8 |
| M 3 | Globular Cluster | Canes Venatici | 13h42m11.8s | +28°22'24" | 6.3 |
| NGC 5466 | Globular Cluster | Bootes | 14h05m27.7s | +28°31'49" | 9.2 |
| 39 Boo | Multiple Star | Bootes | 14h49m41.3s | +48°43'15" | 5.7 |
| M 53 | Globular Cluster | Coma Berenices | 13h12m56.2s | +18°09'56" | 7.7 |
| Pi 1 Boo | Multiple Star | Bootes | 14h40m43.6s | +16°25'06" | 4.5 |
| Whirlpool (M51) | Galaxy | Canes Venatici | 13h29m52.4s | +47°11'41" | 8.9 |
| The Pinwheel (M101) | Galaxy | Ursa Major | 14h03m12.5s | +54°20'53" | 8.3 |
| NGC 5474 & Co. | Galaxies near M101 | Ursa Major | 14h05m01.4s | +53°39'45" | 11.3 |
| NGC 5529 | Galaxy | Bootes | 14h15m34.2s | +36°13'35" | 12.7 |
| IC 5217 | Planetary nebula | Lacerta | 22h23m55.7s | +50°58'00" | 12.6 |
| NGC 5774 & 5775 | Galaxy Pair | Virgo | 14h53m42.6s | +03°34'55" | 12.8 |
| NGC 5371 | Galaxy | Canes Venatici | 13h55m39.8s | +40°27'43" | 11.5 |
| Hickson 68 | Galaxy Group | Canes Venatici | 13h53m40.9s | +40°19'41" | 10.5 |
| NGC 5634 | Globular Cluster | Virgo | 14h29m38.1s | -05°58'42" | 9.5 |
| NGC 5053 | Globular Cluster | Coma Berenices | 13h16m28.2s | +17°41'44" | 9.0 |
| Arp 84 | Interacting Galaxies | Canes Venatici | 13h58m38.0s | +37°25'28" | 12.1 |
| IC 972 | Planetary Nebula | Virgo | 14h04m26.0s | -17°13'41" | 14.9 |
| UGC 7321 | Superthin Galaxy | Com | 12h17m34.1s | +22°32'26" | 14.1 |

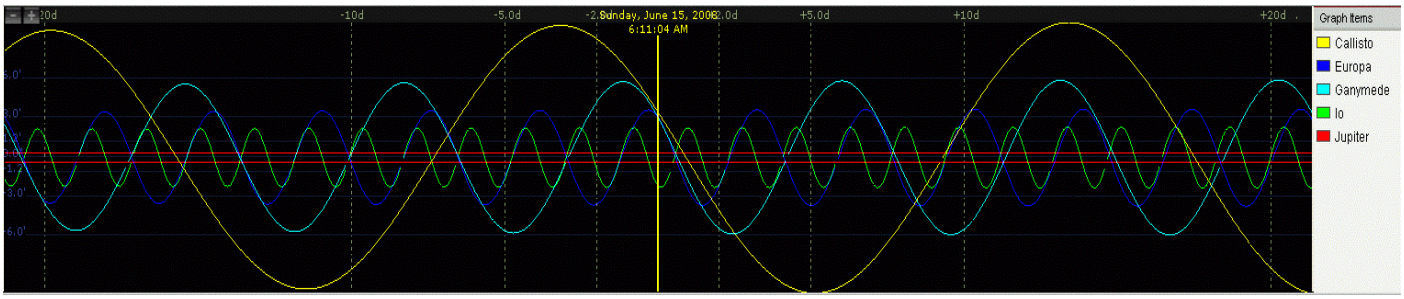
## Moon Phases


## AstroPuzzle Solution for May 2008



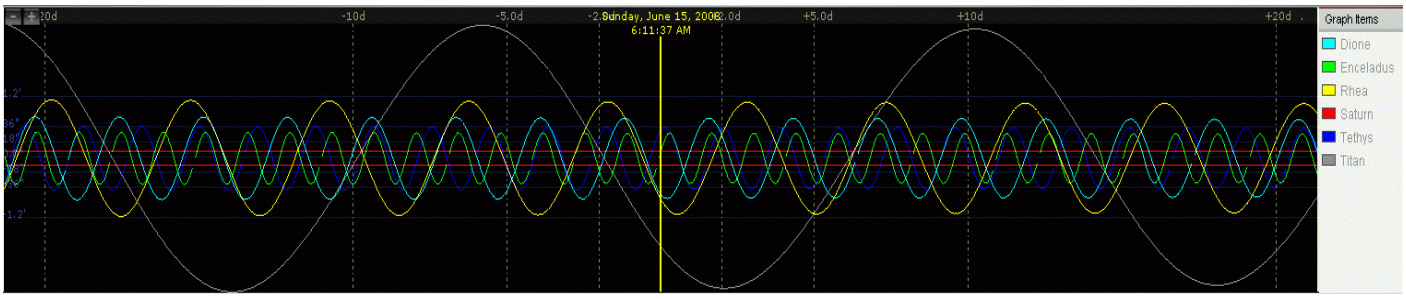

## Jupiter Moon Calendar

Here is a graphical depiction of the visible moons of Jupiter for the month of June 2008.

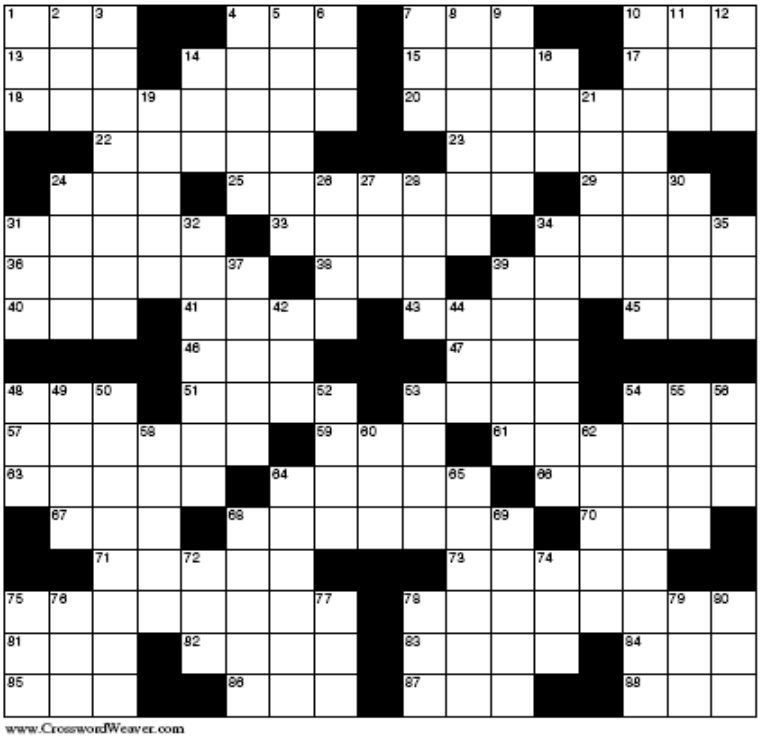



## Saturn Moon Calendar

Here is a graphical depiction of the visible moons of Saturn for the month of June 2008.



# AstroPuzzle - June 2008



www.CrosswordWeaver.com

**ACROSS**

**1** Epoch
**4** *Amount of time it takes the Earth to spin once on its axis.*
**7** Ball holder
**10** Snooze
**13** Garden tool
**14** Father
**15** Seaweed substance
**17** Night bird
**18** *Particles with half-integer spin, such as protons and electrons are known as _____.*
**20** Imperatively
**22** Trounce
**23** Rock and Roll "King"
**24** Alternative (abbr.)
**25** *A closed, symmetrical curve with tow focal points.*
**29** Remind
**31** Entrances opposites
**33** Actress Day
**34** Literary composition
**36** Trite artwork
**38** Clock time
**39** Vegetable
**40** Vane direction
**41** Love flower
**43** Matched
**45** Affirmative
**46** Feign
**47** __ A Small World...
**48** Finale
**51** Wildcat
**53** American state
**54** Acid
**57** Peanut butter candy maker
**59** Sticky black substance
**61** Small bump
**63** *That point on the celestial sphere directly below the observer.*
**64** Pig out
**66** Cloak
**67** Edge
**68** Nail beaters
**70** Basin
**71** Programming language
**73** Group of eight
**75** Coarse
**78** Recognize
**81** Walnut
**82** Hot looking
**83** Left
**84** Kimono sash
**85** North American Indian
**86** Tint
**87** Poem
**88** Tweak

**DOWN**

**1** Extremely high frequency (abbr.)
**2** Caviar
**3** *A meteorite which is stoney.*
**4** Light emitting __
**5** Mr. Schwarzenegger
**6** Affirmation
**7** *A negatively charged lepton, similar to an electron or a muon but much more massive and very short-lived.*
**8** Exodus
**9** *Name of Appolo 11 Lunar module used to land on the moon.*
**10** Cloudy (2 wds.)
**11** Hand tool
**12** Layer
**14** Perch
**16** Pastor (abbr.)
**19** Mongrels
**21** More friendly
**24** *An imaginary straight line on which an object rotates.*
**26** Run
**27** Tax agency
**28** Brad ___, actor
**30** Canal
**31** Stretch to make do
**32** Ice ___, takes off
**34** Shot fired
**35** Environmental protection agency (abbr)
**37** __ pocus
**39** *Second largest moon in the solar system.*
**42** Short-term memory
**44** Brains
**48** White-tailed sea eagle
**49** Not far
**50** Devote
**52** *The smallest particle of any element.*
**53** Recommend
**54** *Period between new moons. 29 days 12 hours 44 minutes.*
**55** Rift
**56** Winter mo.
**58** Singer Paul
**60** Build up
**62** Comforter
**64** *A group of stars, gas and dust held together by gravity.*
**65** Worn away
**68** Pulled
**69** Vista
**72** Transport
**74** Explosive
**75** African antelope
**76** Furrow
**77** Seed bread
**78** The other half of Jima
**79** National police
**80** Shrill bark