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.
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](http://www.worldwidetelescope.org). If you don’t have a souped up computer you can still enjoy Google Sky at [http://www.google.com/sky/](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 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.
Survived its difficult final descent and touchdown at 15 p.m. Eastern Time (7:53:44 p.m. Pacific Time) confirmed the Phoenix Mars Lander had landed on Mars.

Radio signals received at 4:53:44 p.m. Pacific Time (7:53:44 p.m. Eastern Time) confirmed the Phoenix Mars Lander had 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.

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.

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.

"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 CO₂. So even though there's much less ozone at middle altitudes than CO₂, 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.

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**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

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2008 June Celestial Events

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

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<thead>
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<th>Day</th>
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<th>Event</th>
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<td>15:23</td>
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<td>Moon Set</td>
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<tr>
<td>Sat</td>
<td>7</td>
<td>00:10</td>
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<tr>
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<td></td>
<td>00:55</td>
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<td></td>
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<td>20:27</td>
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<td></td>
<td>22:40</td>
<td>Jupiter Rises</td>
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<tr>
<td>Tue</td>
<td>10</td>
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<td>First Quarter Moon</td>
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<td></td>
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<td>Moon Rise</td>
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<tr>
<td></td>
<td></td>
<td>05:31</td>
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<td>Mars Sets</td>
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<tr>
<td>Sun</td>
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<td>22:41</td>
<td>Double shadow transit on Jupiter</td>
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<tr>
<td>Thu</td>
<td>26</td>
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<tr>
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<td>Saturn Sets</td>
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Here is a list of objects for this month. This is reproduced from [www.skyhound.com](http://www.skyhound.com) with the kind permission of its creator and author of SkyTools Greg Crinklaw.

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<td>Multiple Star</td>
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<td>M 3</td>
<td>Globular Cluster</td>
<td>Canes Venatici</td>
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<td>The Pinwheel (M101)</td>
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Moon Phases

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</tr>
<tr>
<td>July 3</td>
<td>July 10</td>
<td>July 18</td>
<td>July 25</td>
</tr>
</tbody>
</table>

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

ACROSS

1  Epoon
2  Amount of time it takes the Earth to spin once on its axis.
3  Ball holder
4  Snooze
5  Garden tool
6  Father
7  Seaweed substance
8  Night bird
9  Particles with half-integer spin, such as protons and electrons are known as ________.
10  Imperatively
11  Trounce
12  Rock and Roll "King"
13  Alternative (abbr.)
14  A closed, symmetrical curve with low focal points.
15  Remind
16  Entrances opposite
17  Actress Day
18  Literary composition
19  Trite artwork
20  Clock time
21  Vegetable
22  Vane direction
23  Love flower
24  Matched
25  Affirmative
26  Feign
27  A Small World...
28  Finale

DOWN

1  Extremely high frequency (abbr.)
2  Cavat
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 Apollo 11 Lunar module used to land on the moon.
10  Cloudy (2 wds.)
11  Hand tool
12  Layer
13  Perch
14  Pastor (abbr.)
15  Mongrels
16  More friendly
17  An imaginary straight line on which an object rotates.
18  Fun
19  Tax agency
20  Brad ______, actor
21  Canal
22  Stretch to make do
23  Ice ______, takes off
24  Shot fired
25  Environmental protection agency (abbr)
26  Focus
27  Second largest moon in the solar system.
28  Short-term memory
29  Brains
30  White-tailed sea eagle
31  Not far
32  Devote
33  The smallest particle of any element.
34  Recommend
35  Period between new moons, 29 days 12 hours 44 minutes.
36  Filt
37  Winter mo.
38  Singer Paul
39  Build up
40  Comforter
41  A group of stars, gas and dust held together by gravity.
42  Worn away
43  Pulled
44  Vista
45  Transport
46  Explode
47  African antelope
48  Furrow
49  Seed bread
50  The other half of Jima
51  North American Indian
52  Tin
53  Poem
54  Tweak

The Spectrogram 9