

# SKYLIGHTS

Newsletter of the Astronomical Society of Northern New England



**JUN 2008**



**Member of NASA's  
Night Sky Network**



**Astronomical League  
Member**

## ASNNE MISSION

ASNNE is an incorporated, non-profit, scientific and educational organization with three primary goals:

- 1) *To have fun sharing our knowledge and interest with others.*
- 2) *To provide basic education in astronomy and related sciences to all who are interested.*
- 3) *To promote the science of Astronomy.*

## What's Up In June

*By Bernie Reim*

**S**ummer always begins around the third week of June for the Northern Hemisphere. This year the summer solstice will happen at 7:59 p.m. EDT on Friday, June 20th. That is the earliest that summer has started for over 100 years, since 1896.

The word solstice means "sun stands still", which is what it appears to be doing at the apex of its trip through the sky. For us at this latitude of about 43 degrees north, that means the sun will rise well north of east, reach nearly 70 degrees high in the sky when it crosses the meridian at high noon, and set well north of west 15 and a half hours later. By contrast, the sun only reaches about 25 degrees in the sky and rises and sets well south of east and west on the winter solstice, when the days are less than 9 hours long and the sun reaches its lowest point on December 21st.

Not only do we experience the shortest night of the year on the summer solstice, we also experience the longest twilights of the year, because the angle of the sun to the horizon is not as steep as in winter.

There are three dimensions of twilight; civil, when you can still read a book outside, nautical, when it is dark enough for some of the brighter stars to appear that are commonly used in navigation, but still light enough to see the horizon, and then astronomical twilight, when most people think it is already dark, but if you look closely you will notice that the Milky Way galaxy still looks washed out. Each division of twilight is defined by the sun reaching another 6 degrees below the horizon.

On the summer solstice the sun will set at 8:25 p.m., civil twilight ends at 9:01, nautical twilight at 9:48, and astronomical twilight doesn't end until 10:48 p.m. It is not completely dark until the sun reaches 18 degrees below the horizon. As you go farther north, some parts of the earth will never get beyond one of those phases of twilight all night long near the summer solstice. That is why Scandi-

navia is known as the land of the midnight sun. If you travel farther north into Greenland and parts of Canada, you will not see any phase of twilight at all at this time. The most extreme case is the North Pole, which experiences 6 months of daylight in summer and 6 months of night in winter.

Even for us at this latitude, astronomical twilight already begins at 2:37 in the morning, so our true night is less than 4 hours long on the summer solstice.

The nights may be very short now, but there is plenty of planetary action to observe during those short nights. Mars continues to rapidly catch up with Saturn at the rate of half a degree per day. The red planet begins the month 18 degrees to the west of Saturn and Regulus, the white star just to the right of the slightly brighter golden planet, but ends the month less than one degree above Regulus and 5 degrees west of Saturn. Keep watching this pair of contrasting planets into next month, when they will pass within less than one degree of each other on July 9. Notice the differences in their brightness and color. Golden Saturn is one magnitude, or two and a half times brighter than Mars is now.

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## **Club Contacts**

### **Officers:**

President:  
Tim Brown  
zawijava@maine.rr.com

Vice President:  
Joan Chamberlin  
starladyjoan@yahoo.com

Secretary:  
Sara Dinyari  
scarterdin@hotmail.com

Treasurer:  
Wes Brann  
wbrann@maine.rr.com

### **Board of Directors:**

David Bianchi  
dbianchi@verizon.net

Scott Kearney  
scottydog1@verizon.net

Joyce Brann  
wbrann@maine.rr.com

### **Star Party Co-ordinator:**

TBD

### **Skylights Editor:**

Paul Kursewicz  
pkursewicz@verizon.net

### **Website Manager:**

Jim Hatch  
nerdfulthing@earthlink.net

### **NASA Night Sky Network Co-ordinator:**

Joan Chamberlin  
starladyjoan@yahoo.com

### **JPL Solar System Ambassador:**

Joan Chamberlin  
starladyjoan@yahoo.com

## **What's Up "Continued from page 1"**

As if to highlight and point out the rapid approach of Mars and Saturn, the waxing crescent moon will pass just one degree below Mars on the evening of Saturday, June 7, and it will pass just below Regulus, next to Saturn, the next evening. The moon constantly moves eastward at the rate of 12 degrees per day.

Jupiter keeps rising a little earlier each evening approaching its July 9 opposition, when it rises at sunset and doesn't set until sunrise. As June begins, the King of the Planets rises around 11 pm, but it will rise just half an hour after sunset by the end of the month, softly glimmering into view in the southeastern sky just as nautical twilight begins.

Watch the nearly full moon around 11 pm on June 16 as it passes directly below Antares, the brightest star in Scorpius, and one of the largest stars in our whole galaxy of 200 billion stars. Antares, which means "rival of Mars", is a red supergiant star that is 700 times larger than our sun. So if you place Antares where our sun is located in the sky, all 4 terrestrial planets, from Mercury through Mars, would be orbiting inside its surface! It would even extend beyond the asteroid belt, nearly all the way to the planet Jupiter. Then keep watching the moon as it drifts through Sagittarius and just below Jupiter on the 19th. This is also the best time of year to watch Antares, since it rises at sunset and stays in the sky all night long, but it never gets very high in the sky for us at this latitude.

As you watch the full moon point out these dramatic objects during that week, be aware that the summer full moon takes the lowest path through the sky, which is exactly the opposite of what the sun does in summer. Just imagine that the moon is the sun, and that would be the path that our sun takes through the sky during the winter solstice.

June 3. New moon is at 3:23 p.m. EDT. The moon is also at perigee, or closest to Earth today. That means we will have higher than usual tides today since normal spring tides happen twice a month, at new and full moon, but they get an additional foot or so higher if perigee happens to coincide with a full or new moon.

June 4. On this day in the year 2000, the Compton Gamma Ray Observatory was allowed to reenter our atmosphere in a controll-

ed, fiery crash in the south Pacific about 4000 miles off the Australian coast. The larger pieces created massive sonic booms that were telecast live on CNN when it happened 8 years ago. In its 9 years of operation, this telescope gave us a wealth of information about the extremely violent, high energy aspects of our universe way beyond our own Milky Way Galaxy. It discovered about one new gamma ray burst each day. At first astronomers had no idea what could produce such powerful explosions, since they were about 100 times more powerful than a normal supernova. Then they coined a new term "hypernova" for this event. About one in 100,000 supernovae is a hypernova. That marks the final death cry of that massive star and the birth cry of a black hole, which is essentially a tear in the very fabric of the fourth dimensional space-time continuum.

June 10. First quarter moon is at 11:04 am.

June 18. Full moon is at 1:30 pm. This is also called the Strawberry or Rose Moon.

June 20. The Summer Solstice is at 7:59 pm.

June 26. Last quarter moon is at 8:10 am. Charles Messier was born on this day in 1730. He was a French astronomer and comet hunter who compiled a catalogue of 110 celestial objects which first appeared like they could have been comets, but they did not move from night to night. Those objects included star cluster, nebulae, and galaxies. About 70 of those objects are visible with just a good pair of binoculars.

June 30. At 7:14 am on this day in 1908, exactly 100 years ago over Tunguska, Siberia, a massive, 10 megaton explosion, occurred 5 miles above the earth. Caused by a comet or asteroid fragment that tore through our atmosphere at supersonic speeds, creating a shock wave that completely leveled 80 million trees over 1000 square miles, its impact was felt thousands of miles away. If it would have struck just four hours later, it would have completely destroyed the Russian Imperial city of St. Petersburg.

## Moon Phases

**June 3**  
New

**June 10**  
First Quarter

**June 18**  
Full

**June 26**  
Last Quarter

## Moon Data

**June 3**  
Moon at perigee

**June 7**  
Mars 1.1° north  
of Moon

**June 9**  
Saturn 3° north  
of Moon

**June 16**  
Moon at apogee

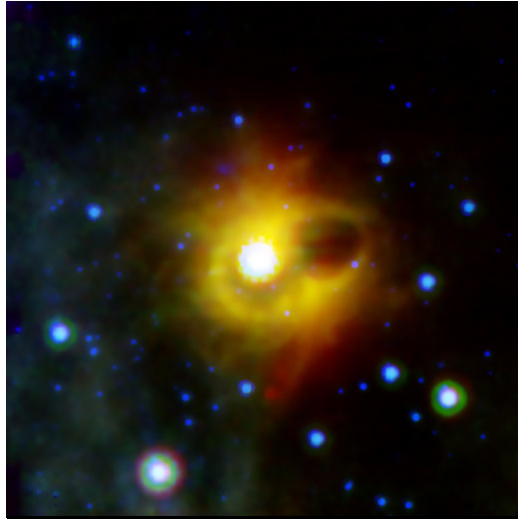
**June 17**  
Antares 0.2° north  
of Moon

**June 20**  
Jupiter 2° north  
of Moon

**June 23**  
Neptune 0.8° south  
of Moon

**June 25**  
Uranus 4° south  
of Moon

NASA's Spitzer Space Telescope has found a bizarre ring of material around a magnetar.



This image shows a ghostly ring extending seven light-years across around the corpse of a massive star. The collapsed star, called a magnetar, is located at the exact center of this image. NASA's Spitzer Space Telescope imaged the mysterious ring around magnetar SGR 1900+14 in infrared light. The magnetar itself is not visible in this image, as it has not been detected at infrared wavelengths (it has been seen in X-ray light).

Magnetars are formed when a massive star ends its life in a supernova explosion, leaving behind a super dense neutron star with an incredibly strong magnetic field. The ring seen by Spitzer could not have formed during the original explosion, as any material as close to the star as the ring would have been disrupted by the supernova shock wave. Scientists suspect that the ring may actually be the edges of a bubble that was hollowed out by an explosive burst from the magnetar in 1998. The very bright region near the center of the image is a cluster of young stars, which may be illuminating the inner edge of the bubble, making it look like a ring in projection.

This composite image was taken using all three of Spitzer's science instruments. The blue color represents 8-micron infrared light taken by the infrared array camera, green is 16-micron light from the infrared spectograph, and red is 24-micron radiation from the multi-band imaging photometer.

**Image and caption credit:  
NASA/JPL-Caltech**

*Club Members  
This space is reserved for you!*

**Principal  
Meteor  
Showers in  
2008**

**January 4**  
Quadrantids

**April 22**  
Lyrids

**May 6**  
Eta Aquarids

**July 30**  
Delta Aquarids

**August 12**  
Perseids

**October 9**  
Draconid

**October 21**  
Orionids

**November 9**  
Taurids

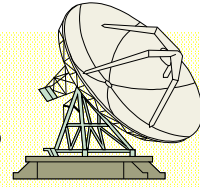
**November 18**  
Leonids

**November 26**  
Andromedids

**December 14**  
Geminids

**December 22**  
Ursids

*Note: Dates are  
for maximum*



## Got any News? Skylights welcomes your Input.

*Here are some suggestions:*

*Book reviews -- Items for sale -- New equipment -- Ramblings --  
Star parties -- Observing -- Photos.*

## Club Items For Sale



Our club has merchandise for sale at:  
[www.cafepress.com/asne](http://www.cafepress.com/asne)

*All money raised goes to our operating fund.*

Any design can be put on any item.  
Just let our President, David Bianchi, know.

### SHOP CATEGORIES

Postage • Apparel • Housewares  
Hats & Bags • Stickers, Buttons & Magnets



## 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<sub>2</sub>. So even though there's much less ozone at middle altitudes than CO<sub>2</sub>, 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.

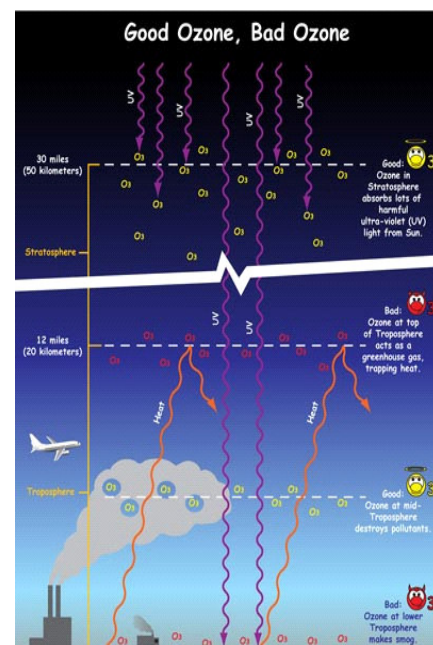
Data from TES show that ozone's heat-trapping effect is greatest in the spring, when intensifying sunlight and warming temperatures fuel the reactions that generate ozone. Most of ozone's contribution to the greenhouse effect occurs within 45 degrees latitude from the equator.

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/](http://tes.jpl.nasa.gov/). Kids can get a great introduction to good ozone and bad ozone at [spaceplace.nasa.gov/en/kids/tes/gases](http://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.

## Club Meeting & Star Party Dates

Date	Subject	Location
June, 6	5:00PM to 6:20 PM Business Meeting. 6:30PM to 7:15PM Beginner Classes. 7:30PM Club Meeting Begins: Topic: <b>TBD</b> (Possible observing after the meeting).	Masonic Hall West Kennebunk, Me.
June 13, Dusk	Open Observing Session with rain/cloud date of June 14. York Middle School is planning to attend. Members and guests are encouraged to bring their telescopes and binoculars if they wish.	Starfield Observatory, West Kennebunk, Me.

### Directions to ASNNE event locations

#### Directions to Masonic Hall

##### **From I-95:**

If coming southbound, take Exit 25 off of I-95. Come out to Rte. 35. Turn left at stop sign and turn right at next stop sign. Proceed straight ahead and you will see a variety store on the left and the Masonic Hall will be on the right.

If coming northbound, take Exit 25 off of I-95. Turn right at the stop sign and cross over I-95. Proceed straight for about 1/2 mile. There will be a variety store on the left and the Masonic Hall will be on the right.

#### Directions to Starfield Observatory

##### **From North:**

Get off turnpike at exit 32, (Biddeford) turn right on Rt 111. Go 5 miles and turn left on Rt 35. Go 2 miles on Rt 35 over Kennebunk River to very sharp 90 degree left turn. The entrance to the Starfield Observatory site is at the telephone pole at the beginning of the large field on the left. Look for the ASNNE sign on the pole.

##### **From South:**

Get off the turnpike at exit 25 in Kennebunk. After toll both turn right on Rt 35. Go up over the turnpike and immediately turn right on Rt 35. About 4 miles along you will crest a hill and see a large field on your right. Continue until you reach the end of the field. Turn right into the Starfield Observatory site at the last telephone pole along the field. Look for the ASNNE sign on the pole. If you come to a very sharp 90 degree right turn you have just passed the field.

To join **ASNNE**, please fill out the below membership form. *Checks should be made payable to: Astronomical Society of Northern New England (A.S.N.N.E).* For more details, please visit our website:  
<http://www.asnne.org>



Astronomical Society of Northern New England  
 P.O. Box 1338  
 Kennebunk, ME 04043-1338

**2008 Membership Registration Form**

(Print, fill out and mail to address above)

Name(s for family): \_\_\_\_\_

Address: \_\_\_\_\_

City/State: \_\_\_\_\_ Zip code: \_\_\_\_\_

Telephone # \_\_\_\_\_

E-mail: \_\_\_\_\_

Membership (check one):

Individual \$35 \_\_\_\_\_ Family \$ 40 \_\_\_\_\_ Student under 21 years of age \$10 \_\_\_\_\_ Donation \_\_\_\_\_

Sky & Telescope (\$32.95) \_\_\_\_\_ Astronomy (\$34) \_\_\_\_\_

Total Enclosed \_\_\_\_\_

Tell us about yourself:

1. Experience level: Beginner \_\_\_\_\_ Some Experience \_\_\_\_\_ Advanced \_\_\_\_\_

2. Do you own any equipment? (Y/N) And if so, what types?  
 \_\_\_\_\_

3. Do you have any special interests in Astronomy?  
 \_\_\_\_\_

4. What do you hope to gain by joining ASNNE?  
 \_\_\_\_\_

5. How could ASNNE best help you pursue your interest in Astronomy?  
 \_\_\_\_\_

6. ASNNE's principal mission is public education. We hold many star parties for schools and the general public for which we need volunteers for a variety of tasks, from operating telescopes to registering guests to parking cars. Would you be interested in helping?

Yes \_\_\_\_\_ No \_\_\_\_\_

7. ASNNE maintains a members-only section of its web site for names, addresses and interests of members as a way for members to contact each other. Your information will not be used for any other purpose. Can we add your information to that portion of our web site?

Yes \_\_\_\_\_ No \_\_\_\_\_

