SKYLIGHTS

Newsletter of the Astronomical Society of Northern New England

August 2006

Member of NASA's Night Sky Network

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 August

by Bernie Reim

This will be the last full month of our unusually hot and humid summer. There are several highlights to enjoy this month including three morning planets, the famous Perseid Meteor Shower, and the Milky Way high overhead, if the humidity is low enough to reveal some of its stunning and intricate beauty.

Most of the planetary action is now shifting to the morning sky. We lost Saturn as an evening planet last month, but it will reappear in the morning sky by the third week of this month. We will also lose Mars by the middle of the month, but, unlike Saturn, Mars will not return to our skies until December, when it will be part of a rare triple grouping of planets including Mercury and Jupiter in the morning sky. Only Jupiter remains in our evening skies for the whole month, and even the King of the Planets will sink too low into the west by the end of October.

Brilliant Venus was the glowing morning beacon since late January, but now it will finally gain some company as first Mercury and then Saturn will join it as "morning stars". At minus 3.7 magnitude, Venus is only a little fainter than it was last month. Venus is still getting slightly smaller and more fully illuminated by the sun until its conjunction on October 27th, after which it will reappear in our evening sky in December.

Mercury will join Venus on August 10 and 11, best seen 45 minutes before sunrise. Mercury will be just over two degrees below Venus and about 15 times fainter. Look for three members of the winter hexagon that morning, along with the pair of planets. Procyon, in Canis Minor, will be the lowest star, and Castor and Pollux, the Gemini twins, will be above the pair of planets.

Saturn joins Venus by August 21. All three planets will be less than 10 degrees, or one fist at arm's length, apart for several mornings. Mercury will be the lowest planet, then Saturn, and then Venus just above and to the right of the other two. Saturn will be about 40 times fainter than Venus. An extremely thin waning crescent moon will be just above the planetary trio on Monday morning the 21st, 30 minutes before sunrise and an even thinner moon, only 34 hours before new moon, will be just to the left of Saturn in the middle of the trio on Tuesday morning, August 22.

The Perseid Meteor Shower will peak on Friday night August 11 to Saturday morning August 12. You can usually expect up to 60 meteors per hour from the Perseids, which are typically the second best out of the 10 best and most reliable showers each year. However, this year they will happen just two days after full moon, so you can expect far fewer visible meteors because the moon will be way too bright. Only the really bright meteors and some bolides will be visible. Caused by dust and debris in the trail of Comet Swift-Tuttle, these sand grain-sized pieces of this comet will be streaking into our atmosphere at nearly 40 miles per second. This comet orbits the sun every 130 years and it was last near the sun in 1992, when the Perseids were considerably

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NEW AND IMPROVED NASA NIGHT SKY NETWORK WEBSITE

by Joan Chamberlin

The Night Sky Network has been growing and expanding, reaching more and more people across the United States. To celebrate our success and better serve the astronomy community the Night Sky Network, JPL's PlanetQuest Public Engagement Program, NASA Education Forum on Solar System Exploration, and the Astronomical Society of the Pacific have teamed up to update the Night Sky Network website.

Here are some of the new and exciting features on the site! Browse around and get to know us!

*** New Introduction Video**.

Learn about the Night Sky Network by watching our new video. Visit the "About the Network" page at **http://nightsky.jpl.nasa.gov/about.cfm** and watch the short video. Astronomical Society of Northern New England is mentioned on the video with a quote from Joan Chamberlin about the telecons.

*** Night Sky Planner**.

Our handy resource page for planning your night of astronomy! The planner includes: Satellite Sighting Dates and Times for the International Space Station and Tracking ISS

Sunset and moonrise times for today or the whole year

Celestial Calendar
Map Quest
Current sky map
Weather forecast
Clear Sky Clock for astronomy clubs across the country, including ASNNE

*** Sample of a Night Sky Network activity**.

Curious about what kind of activities the Night Sky Network provides? Take a peek at a sample activity, perfect for classroom, scout meetings or just about anywhere you have an audience interested in learning about astronomy!

*** NASA Resources for Amateur Astronomers.**

Consolidates on one page many of the NASA programs and resources of particular use to amateur astronomers. It is a link to many interesting websites.

Stars in the Night Sky Network is still on the site. Click on to see ASNNE is #4 right now. Also click on the link for ASNNE and you can read about 4 events that Joan has logged in under "See Samples of this Club's Activities.

Find Clubs in the USA is a map showing all the member clubs. You can click on the states and find out which clubs are in that state and contacts for the club.

I hope all of you will visit this awesome website. It has much more to offer to members and to the public now. To get there go to **http://nightsky.jpl.nasa.gov/** The photo and much of the information is quoted from the NASA Night Sky Network website, which is sponsored by JPL and Astronomical Society of the Pacific.

Moon Phases

August 2
First Quarter

August 9
Full

August 15
Last Quarter

August 23
New

Moon Data

August 2
Jupiter 5° north of Moon

August 4
Antares 0.4° north of Moon

August 9
Neptune 3° north of Moon

August 10
Moon at perigee

August 11
Uranus 0.3° north of Moon

August 21
Venus 3° south of Moon

August 25
Moon at apogee

Mars 0.6° north of Moon

August 28
Spica 0.5° north of Moon

The End of Science

by Richard Beaulieu

The author of this book has the firm conviction that all of the great discoveries of science have already been done, and science now will apply what we have found and do little things to confirm the great theories already established; and as far as new theory, it will be unprovable speculation.

The book is a series of interviews of about fifty of the leading scientists and philosophers, which give an interesting glimpse into what is happening in science now, especially the speculation.

I would like to state here that Horgan must be sexist. All of the interviews are of men. There is no shortage of women scientists that are doing first rate work. He could have included a few; but he didn't.

Some of the interviewees are of the opinion that science is over, and some are not. But with Horgan, it is unshakeable.

If theoretical physicists arrive at the grand unified theory, one that will include all four elementary forces in one, that will mean, according to Horgan, that physics is completed. It is all over.

Horgan says that biologists now are just adding little bits to confirm Darwin's theory. No new theory could possibly be as grand or greater.

Horgan allows for the possibility that religion will snuff out scientific inquiry.

In Canada, a week ago, I heard that the Eskimos or Inuit fight against the teaching of Darwinism in their schools. They want to have traditional Inuit creation myths in the biology classroom.

This sort of thing might be the end of science.

At the end of the book, Horgan has a stupid chapter on theology. In it, he talks about the most important experience of his life, a vision (drug induced?) in which he found out that God is terrified of himself, and that explains why there is evil in the world.

Don't ask me for any clearer explanation. There isn't any in the book.

To me, it doesn't make sense.

About the end of all great discoveries, our own Brother Albert pointed out that we have just discovered dark matter and dark energy. We have just begun to find out what 95% of the universe is made of. How much of a greater fundamental discovery could you ask for?

In the most recent "Discover", I just read that the WMAP satellite has found evidence that inflationary theory is true. Inflation is a very rapid expansion of the universe a fraction of a second after the big bang.

Horgan says that inflation is " almost certainly untestable". But a few years later, here we are with observational evidence for it.

These are discoveries in theoretical science. And what will they lead to?

In the end of his book, Horgan admits that most scientists don't agree with him about the end of science.

But he sticks to his guns.

Got any News?
Skylights welcomes your input.

Principal Meteor Showers in 2006

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

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

better for several years.

The Leonid Meteor Shower on November 18, 2001, just after its parent comet, Tempel-Tuttle returned in 1999, was by far the most spectacular meteor shower and one of the most memorable astronomical events I have ever witnessed. From our dark sky observatory site in an open field in west Kennebunk, I saw nearly 3000 Leonids in 3 hours, right up to just before sunrise. That averaged out to one meteor every 4 seconds, or 15 every minute. Even the best standard showers, when the parent comet is not nearby, only produce one meteor per minute. What made that Leonid shower even more impressive was its consistency, with not a single lull of more than 10 to 15 seconds and seeing as many as 7 meteors in a single second, all emanating from its radiant in the constellation of Leo the Lion. It was a true "meteor storm", just raining meteors continuously for several hours. We even saw about 15 bolides that lasted for many seconds and exploded in brilliant flashes of light, with their resultant dust trails lingering for many minutes. That was the first time I really got a sense of the whole Earth's constant 18.6 mile-per-second motion through space as we were plowing through this swarm of comet dust on our never-ending journey around the sun.

After Mars disappears, Jupiter will become the sole surviving evening planet until October. If you have access to a good telescope, watch how the newly discovered Red Spot Junior, traveling just below and in the opposite direction as the Great Red Spot, is beginning to merge with and affect the Great Red Spot, a 400 mile-per-hurricane that covers twice the size of Earth. Several smaller white ovals merged to form Red Spot Junior. These storms then intensify and become brownish and reddish as phosphine gas is being dredged up from deeper within the Jovian atmosphere and then exposed to ultraviolet light from the sun as these powerful storms can raise this material 5 miles above the rest of the cloud tops of Jupiter.

Aug.2. First quarter moon is at 4:46 a.m. EDT.

Aug.3. The moon will pass below Jupiter and right under Antares, an orange star in Scorpius, the first 4 evenings this month.

Aug.7. Saturn is in conjunction with the sun. It will reappear in our morning sky just 2 weeks later.

Aug.9. Full moon is at 6:54 a.m. The August full moon is also called the Sturgeon, Corn, Grain, Lightening, or Dog Days Moon.

Aug.10. Mercury is 2.2 degrees below Venus in the morning sky. Neptune reaches opposition tonight in Capricorn. At 7.8 magnitude, you will need a telescope to discern its bluish aquamarine tint. Two large asteroids of similar magnitudes will also be visible near Neptune in Capricorn this summer and fall. They are Hebe, at 115 miles in diameter, and the largest of all asteroids and the first one to be discovered, way back in 1801, Ceres, at 530 miles in diameter.

Aug.11. Venus forms a straight line with Castor and Pollux this morning and the next. The Perseid Meteor Shower peaks.

Aug.15. Last quarter moon is at 9:51 p.m.

Aug.21. Saturn is one degree to the upper right of Mercury in the predawn sky, with Venus just above the pair. You may need to use binoculars to see all three planets.

Aug.23. New moon is at 3:10 p.m.

Aug. 24. On this day in 1989, Voyager 2 flew closely past Neptune. NASA and JPL broadcast this live in the "Neptune all Night" program, when scientists were trying to make sense of the remarkable images they were getting. For example, they found ice volcanoes spewing plumes of liquid nitrogen and methane compounds onto the pinkish surface of Triton, the largest moon of Neptune, the most distant of the gas giants in our solar system. At 400 degrees below zero F on the average, Triton is the coldest place in our solar system, even colder than Pluto.

Aug.31. First quarter moon is at 6:56 p.m. Antares is just above the moon tonight.

Did You Know

- Stars range in size from bloated blue and red supergiants to tiny red dwarfs a fraction of our Sun's mass.

- Massive stars easily rank as the most luminous in the universe. The brightest outshine the Sun by a million times. These are the only stars bright enough for us to see in distant galaxies.

- There are two popular theories about the birth of massive stars: **1)** They form like low mass stars, gravity causes an interstellar gas cloud to collapse and fragment, with both big and small stars forming in the process. **2)** Massive stars are born when smaller objects collide. Most big stars live in clusters, and the more stars a cluster contains, the more massive the largest stars.

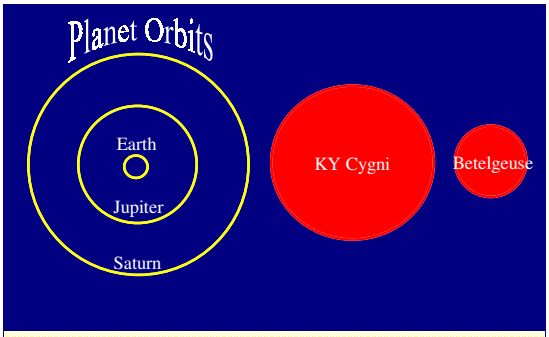
- *Theory suggests* high mass stars formed first. These stars then took on the task of creating the rest of the periodic table.

Largest Stars Known

by Paul Kursewicz

The previous record holder for the largest known star (*Herschel's "Garnet Star," otherwise known as Mu Cephei*) has been bumped into 4th place. In a survey of 74 known supergiant stars in our Milky Way Galaxy, 3 have emerged as larger than any measured so far. The *new research* was presented on Janurary 10, 2005 at the American Astronomical Society meeting in San Diego.

The three stars with the largest known sizes are **KW Sagitarii** (distance 9,800 light-years), **V354 Cephei** (distance 9,000 light-years), and **KY Cygni** (distance 5,200 light-years), all with diameters about 1500 times that of the Sun. These are red supergiant stars that are about twice the diameter of Betelgeuse, the red supergiant in Orion's shoulder (*below figure*).



***The Largest Star Known:** Our Sun is well inside Earth's orbit, shown here. The diameter of Betelgeuse, is also shown to scale. The red supergiant **KY Cygni** is larger. If placed where the Sun is,each of the newly discovered monster stars would extend far past the orbit of Jupiter.*

Despite their tremendous diameters, these red supergiant stars are not the most massive in the universe. They are only 25 times the mass of the Sun, while the most massive stars may have as much material as 100 Suns.

Red supergiants are massive stars nearing the ends of their lifetimes. They are comparatively cool, luminous and very large. However, they are not the most luminous, nor are they the coldest stars known – brown dwarfs have much low temperatures. But the combination of modestly high luminosities and relatively low temperatures *does* mean that they are the biggest stars known, in terms of their stellar diameters.

Most Massive Stars (3 contenders)

Massive is not the same as **largest**. By using the term massive, I'm talking about *weight* not *size*. Less than 1% of the stars within 100 light-years of Earth rank as high-mass stars (those more than 10 times heavier than the Sun). For the **real heavyweights**, the nearest ones lie much further away.

The Pistol Star which may be the most luminous star in the Milky Way Galaxy (only if stellar candidate *LBV 1806-20* is a tightly packed group or cluster of stars rather than an individual), is 10 million times as bright as the Sun and about 100 times as massive. The star unleashes as much energy in 6 seconds as the Sun does in one year. This star is located 25,000 ly away in the constellation Sagittarius. It cannot be seen with the naked-eye because interstellar dust clouds hide it from view; instead, it was discovered by the Hubble Space Telescope in the early 1990s using infrared wavelengths that penetrate the dust.

LBV 1806-20 is also located in the constellation Sagittarius and is comparable in luminosity to *Pistol Star* or *Eta Carinae*, contenders for the most luminous star (all of which are **luminous blue variables**). Despite its high luminosity, it is virtually invisible because less than one billionth of its visible light reaches us, the rest being absorbed by intervening interstellar gas and dust, giving it an apparent brightness of 35th magnitude. This star has been measured to have at least 130 solar masses. Some even give the star 150 to 200 solar masses. If true, it holds the title for the most massive star. Located 30,000–49,000 light years from our Sun, toward the center of the galaxy.

Eta Carinae is located in the constellation Carina and lies about 7,500 light-years from Earth. The star itself is surrounded by a large, bright nebula. Estimates of its mass range from 100–150 times the mass of the Sun, and its luminosity is about four million times that of the Sun. As of July 2006, *Eta Carinae* is the fifth most luminous star yet discovered. Stars this large are extraordinarily rare and it is thought that these stars approach the theoretical upper limit of stellar mass. Eta Carinae is only of 8th magnitude (still invisible to the naked eye).

Club Meeting & Star Party Dates

Date	Subject	Location
Aug. 04, 7:30 PM	The *regular club* meeting will be held at 7:30pm. Topic TBD **NOTE: Beginner classes will be held from 6:30 PM to 7:15 PM.**	Masonic Hall West Kennebunk, Me.
Aug. 25, Dusk	Open Observing Session with rain/cloud date of August 26th (New Moon on the 23rd).	Starfield Observatory, West Kennebunk, Me.
Sept. 01, 7:30 PM	The monthly Club Meeting. Topic TBD.	Masonic Hall West Kennebunk, Me.
Sept. 22, Dusk	Starfest Weekend (Open Observing Session).	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

2006 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_____