

SKYLIGHTS

Newsletter of the Astronomical Society of Northern New England



JULY 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 July

By Bernie Reim

This is the first full month of summer and there are several celestial and man-made highlights to watch for to add some excitement to this new season.

As the nights are already getting longer gain, there are three celestial highlights to enjoy. Mars will finally catch up with and pass Saturn, Jupiter reaches opposition, and there will even be a meteor shower thrown in for good measure, the Delta Aquarids.

After racing across the sky throughout the spring, Mars will catch up with Saturn on Wednesday evening the 9th. Even before that happens, Mars will be less than one degree above Regulus on July 1, and about 4 degrees to the right, or west of Saturn. Watch closely every clear evening during the first ten days of this month to watch this much anticipated celestial drama unfold. To make it even more spectacular, a slender crescent moon will glide just underneath the trio on the evenings of Saturday the 5th and Sunday the 6th, one hour after sunset in the western sky.

Notice the different colors and magnitudes of these three objects. Golden Saturn is brightest at 0.8 magnitude, then bluish-white Regulus at 1.4, and then orange Mars is the faintest at 1.6 magnitude. Each magnitude number is a difference of two and a half times in brightness.

Mars is the closest at about 200 million miles, or just over twice the earth-sun distance. Then Saturn is nearly one billion miles away and the star Regulus in Leo is 77 light-years away. Converting these distances to light time makes Mars 17 minutes away, Saturn just over 1 hour, and Regulus 77 years. That places Regulus just over half a million times farther away than distant Saturn. When the crescent moon joins this trio, keep in mind that it is only one second away at the speed of light. So here you have a rare quartet of heavenly objects that will give you some insight into the precise mathematics of the solar system and nearby area of our Milky Way gal-

axy, as well as providing us with great natural beauty.

Drifting rapidly along at the rate of half a degree per day, or only 24 times slower than the moon continually moves, Mars will already be 11 degrees to the left, or east of Saturn by the end of this month. The red planet continues to fall farther and farther behind Earth in our orbit around the sun, so it continues to get smaller and dimmer in our sky.

By coincidence, Jupiter will reach opposition on Wednesday, July 9, the same day that Mars and Saturn will be at their closest until 2022. Similar to a full moon, Jupiter will be on the opposite side of the earth from the sun. That means the King of the Planets will rise at sunset, reach its highest point in the sky at midnight, and not set until sunrise. All the superior planets from Mars out to Neptune also reach the midpoint of their retrograde motion at opposition. That is the best time to view them, because they will be closest to Earth and biggest and brightest in our sky. Jupiter started its retrograde, or westward motion back on May 9th and it will switch back to direct motion in early September. Shining brightly at magnitude -2.7, Jupiter is over 6

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times brighter than Saturn.

The Delta Aquarid meteor shower, caused by the earth passing through the debris trail of Comet Machholz, will only produce about 15 meteors per hour after midnight on the morning of Monday the 28th. However, you may see more than just Aquarids, because the famous Perseids will already have started, although they will not peak until August 12th.

The man-made highlights to watch for this month are the recent launch of GLAST (Gamma-ray Large Area Space Telescope) and the ongoing drama of the Phoenix mission on Mars. Launched on June 11, 8 years after our last gamma-ray space telescope was allowed to crash back to Earth after 9 years of gathering amazing data and seeing about one powerful gamma-ray burst each day, GLAST has established its communication link and is now tuning its instruments. It should be ready to start pouring in new data by the end of this month. Now we have an even better tool to study the many burning questions about the most extreme high energy environments anywhere in the universe. Its mission objectives include searching for signs of new laws of physics and what constitutes the mysterious dark matter and dark energy. It will also try to explain how black holes can accelerate immense jets of material to nearly light speed and try to answer detailed questions about solar flares, pulsars, and the origin of cosmic rays. So when you enjoy the fireworks on earth this month, keep in mind that nature is constantly producing infinitely more powerful fireworks!

When you look at Mars and Saturn this month, remember that the Phoenix lander is up there on the red planet near its North Pole and digging away into its icy soil looking for signs of life, although it hasn't found any yet.

July 2. New moon is at 10:19 p.m. EDT.

July 4. Earth is at aphelion, or farthest from the sun today. This happens every year at this time, but today we will be at the most distant aphelion of the decade and the second most distant for the whole century. This is because it occurs near new moon, so the earth has to lean a little farther out to balance the gravitational pull of the moon perfectly, just as a parent swinging a child around by its arms has to lean backwards.

July 6. Isaac Newton published his Principia, the greatest math book ever written, on this day in 1687. Mars, Saturn, and the moon form a nice conjunction this evening.

July 9. Mars and Saturn are at their closest, less than one degree apart and Jupiter reaches opposition.

July 10. First quarter moon is at 12:35 a.m.

July 14. The moon is at apogee, or farthest from Earth today.

July 16. The first fragment of Comet Shoemaker-Levy 9 hit Jupiter on this day in 1994. I remember watching 5 of those 21 fragments hitting the gas planet and leaving giant, earth-sized black marks over the course of the next 6 days.

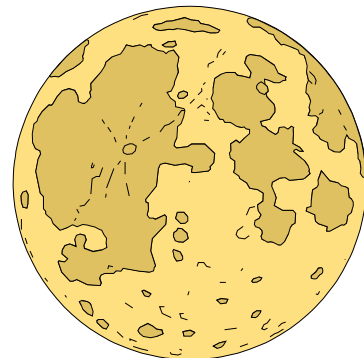
July 17. The moon will 3 degrees south of Jupiter this evening.

July 18. Full moon is at 3:59 a.m. This is also called the Hay or Thunder Moon.

July 20. On this day in 1969 the first humans walked on the moon, still the only place other than Earth that humans have ever set foot upon. Only 12 humans have ever walked on our only natural satellite. The last two were in December of 1972. Viking 1 landed on Mars on this day in 1976.

July 25. Last quarter moon is at 2:42 p.m.

July 28. The Delta Aquarid Meteor Shower peaks today. The first photograph of a total solar eclipse was taken on this day in 1851.



Moon Phases

July 2
New

July 10
First Quarter

July 18
Full

July 25
Last Quarter

Moon Data

July 6
Mars 3° north
of Moon

Saturn 3° north
of Moon

July 14
Moon at apogee

Antares 0.3° north
of Moon

July 17
Jupiter 3° north
of Moon

July 20
Neptune 0.9° south
of Moon

July 22
Uranus 4° south
of Moon

July 29
Moon at perigee

July 31
Ceres 0.9° north of
Moon

Sue Yarmey will be the Guest Speaker this month. She will be discussing the following subjects:

Prophecies and 2012:

Ending or New Beginning for Planet Earth?

There's been a lot of talk about the year 2012. Come and hear Sue Yarmey's interpretation of the various prophecies and her understanding of where the planet, and the people who populate it, are heading. From the doomsday interpretation that marks the end of the world, to the new age interpretation that marks the beginning of the Golden Years, Sue will discuss the many prophecies, their general interpretations, and a few newer possible scenarios.

Sue Yarmey has been a practicing psychic for the past 30 plus years. She is a 1975 graduate of the Institute of Psychorientology, the "Silva Method" and a Shaktipat initiate of Anandi Ma. She offers private, individual readings, business consultations and workshops, seminars, psychic parties, purposeful ceremony, and telephone consultations.

Sue Yarmey 207-284-9498,

sueyarmey.com or
sue@sueyarmey.com

Update EMAIL INFO from Claudia Updike, Adria's mother:

Submitted by Pat Achiele

Hello Everyone~

Adria is leaving on Monday for Chile for a month.....she flies to Lima (Peru), then to Santiago, Chile, then to LaSerena. From there a bus/shuttle takes her up the mountain to the observatory. The observatory is like a small city - very unlike Kit Peak! The first link below will tell you about the observatory in Chile; the second link is for Crete, a possible trip in the Fall for Adria

<http://www.ls.eso.org/index.html>

<http://skinakas.physics.uoc.gr/>

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

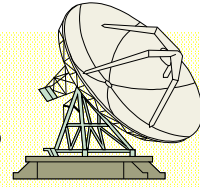
November 18
Leonids

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

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



A Missile in Your Eye

by Patrick L. Barry

Satellite technology designed to catch ballistic missile launches may soon help doctors monitor the health of people's eyes.

For the last 15 years, Greg Bearman and his colleagues at JPL have been working on a novel design for a spectrometer, a special kind of camera often used on satellites and spacecraft. Rather than snapping a simple picture, spectrometers measure the spectrum of wavelengths in the light coming from a scene. From that information, scientists can learn things about the physical properties of objects in the photo, be they stars or distant planets or vegetation on Earth's surface.

In this case, however, the challenge was to capture snapshots of short-lived events—like missile launches! The team of JPL scientists designed the new spectrometer, called a computed tomographic imaging spectrometer (CTIS), in collaboration with the Ballistic Missile Defense Organization as a way to detect missiles by the spectral signatures of their exhaust.

But now the scientists are pointing CTIS at another fast-moving scene: the retina of an eye.

Blood flowing through the retina has a different spectral signature when it is rich in oxygen than when it is oxygen deprived. So eye doctors can use a spectrometer to look for low oxygen in the retina—an indicator of disease. However, because the eye is constantly moving, images produced by conventional spectrometers would have motion blurring that is difficult to correct.

The spectrometer that Bearman helped to develop is different: It can capture the whole retina and its spectral information in a single snapshot as quick as 3 milliseconds. "We needed something fast," says Bearman, and this spectrometer is "missile-quick."

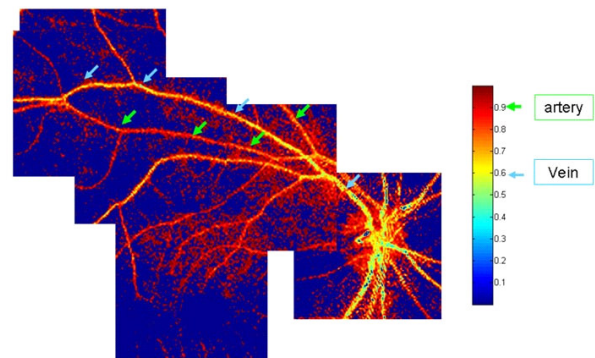
CTIS is even relatively cheap to build, consisting of standard camera lenses and a custom, etched, transparent sheet called a grating. "With the exception of the grating, we bought everything on Amazon," he says.

The grating was custom-designed at JPL. It has a pattern of microscopic steps on its surface that split incoming light into 25 separate images arranged in a 5 by 5 grid. The center image in the grid shows the scene undistorted, but colors in the surrounding images are slightly "smeared" apart, as if the light had passed through a prism. This separation of colors reveals the light's spectrum for each pixel in the image.

"We're conducting clinical trials now," says Bearman. If all goes well, anti-missile technology may soon be catching eye problems before they have a chance to get off the ground.

Information about other NASA-developed technologies with spin-off applications can be found at <http://www.sti.nasa.gov/tto>

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



Caption:

This three-color composite image from the computed tomographic imaging spectrometer shows the oxygenation of the blood in the arteries and veins of a human retina. (Arteries appear red, veins appear yellow.)

Club Meeting & Star Party Dates

Date	Subject	Location
July 5, Dusk	Open Observing Session. Note: This will be on Saturday because of the Holiday. Members and guests are encouraged to bring their telescopes and binoculars if they wish.	Starfield Observatory, West Kennebunk, Me.
July 11, Club Meeting	5:00PM to 6:20 PM Business Meeting. 6:30PM to 7:15PM Beginner Classes. 7:30PM Club Meeting Begins: Guest Speaker: Sue Yarmey. Topic: "Prophecies and 2012. Ending or New Beginning for Planet Earth." <i>For more details see page 3.</i>	Masonic Hall 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 _____

