

SKYLIGHTS

Newsletter of the Astronomical Society of Northern New England



AUG 2007



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.

The International Space Station and the Shuttle

By *Bernie Reim*

"As the great earth, abandoning day, rolls up the deeps of the heavens and the universe, there opens a new door to the human spirit, and few there be so clownish that some awareness of the mystery of being does not touch them as they gaze..." Henry Beston: The Outermost House

The last full day of spring was drawing to a close as a cold front swept the sky clear. One hour after sunset, before most of the stars even emerged, the cool evening twilight had already filled with several bright celestial objects. Brilliant Venus; golden Saturn; Regulus, the King star in Leo; the waxing crescent Moon and bright white Jupiter were all nicely lined up along the ecliptic from west to east.

I walked out on my deck at 9:18 pm to enjoy this sight. However, something much more spectacular than these relatively fixed and slow moving objects was soon to pass over me and the earth.

The normally placid late spring sky was filled with potential for a few minutes before the expected visitors appeared, right on schedule. I could never have imagined what an amazing feeling this sight created for me, and I highly recommend that everyone try to see this at some time for themselves.

The visitors appeared suddenly, low over the trees over the northwestern part of the lake, right where I was looking.

Two new stars had escaped the firmament and started playing tag!

Brighter than Jupiter, but not quite as bright as Venus, these two shining beacons

chased each other through the sky for three full minutes. They seemingly made a mockery of the fixed, staid order of the regular stars and planets and moon, as they skipped lightly all through the sky, delighting in their brilliancy.

Of course they followed a prescribed path, but the energy playing off between these two brilliant objects in the sparkling azure blue of the evening twilight, much brighter than your normal, run-of-the-mill faint little satellites late at night, was palpable and breathtaking.

The ISS was first, zipping right along at 18,000 mph. It was 220 miles straight up, but it seemed so bright and close that I could reach up and touch it. The slightly fainter Atlantis Space Shuttle, STS 118, followed less than 15 degrees behind it in nearly the same orbit. They had just separated the day before, so they were still close together. I wasn't sure how high they were supposed to climb, so I was pleasantly surprised when they climbed all the way up to Arcturus, about 61 degrees high in the sky. They both came within one degree of "hitting" this orange star in their reckless, playful jaunt through the sky that memorable evening.

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Club Contacts

Officers:

President:
David Bianchi
dbianchi@verizon.net

Vice President:
Ron Burk
ron.burk@yahoo.com

Secretary:
Joan Chamberlain
starladyjoan@yahoo.com

Treasurer:
Wes Brann
wbrann@maine.rr.com

Board of Directors:

Tim Brown
zawijava@maine.rr.com

Ian Durham
idurham@anselm.edu

Scott Kearney
scottycdog1@verizon.net

Star Party Co-ordinator:

Ron Burk
ron.burk@yahoo.com

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

The International Space Station and Space Shuttle "Continued from page 1"

Located 37 light years away, this orange-red giant star, the brightest one in the spring sky and the fourth brightest in the whole sky, was certainly in no danger. Arcturus is 24 times the diameter of our sun, so if you place this giant star in the sky where our sun is located, it would cover 12 degrees of the sky, exactly the distance that these two joyous sojourners were following each other through the sky.

Having already run out of hydrogen to fuse in its core, Arcturus has evolved off the "main sequence" on the Hertzsprung-Russell diagram, where all the stable stars in our galaxy can be classified. It now fuses helium into carbon and oxygen. (Three similar, bright orange stars that do this are Aldebaran in Taurus, Capella in Auriga the Charioteer, and the immortal twin, Pollux in Gemini.)

These two brilliant objects seemed to be playing in the sky like the gods, writing their own new mythologies as they skipped along. No longer based on ancient misconceptions, we are now just beginning to achieve a tiny bit of our potential as humans on Earth as we begin to work together for the common good and explore the final frontier.

The air, what little is left of it at 220 miles up, is truly rarefied. Earth's exosphere extends up to 600 miles out, but the densest part of our atmosphere, called the troposphere, where all of our weather takes place, only extends up to 40,000 feet or 8 miles, where our jets fly every day.

As soon as I glimpsed the pair, I was instantly transported up there and looked back down on Earth. Since the Space Age started in 1957 with Sputnik, we have all seen great pictures of what the earth looks like from space, so that was easy to see in my mind's eye. I also thought of the astronauts in the space station

and the ones in Atlantis, and was envious of their clear view of this little "corner" of North America and the Atlantic Ocean. I wasn't happy about all the major problems now occurring on many parts of our home. It is amazing what a grand global perspective you can achieve just by placing yourself up there, a mere 220 miles up and looking back down on our "Spaceship Earth".

I had seen a shuttle chasing the ISS many years ago, when it was still much smaller and less bright. The ISS will get as bright as Venus, at minus 4.4 magnitude when it is finished. The next night I saw them pass over the blueberry barrens as one object, and it became the brightest man-made object ever placed in the sky up to that point. I even saw them one more time in a lower orbit for a third night in a row. That time they emitted a brilliant flash for a second or two as the sunlight reflected off the solar panels on the ISS. I had seen the ISS or a space shuttle alone many times, but there is nothing like seeing them chase each other that close together.

This 2007 summer solstice night, I watched them as long as I could. The distance between them actually shrunk to just 5 degrees or so as they dove back down into the trees in the southeast, just narrowly missing the bright king of the planets, Jupiter. The ISS is now at minus third magnitude, which is already a little brighter than Jupiter at minus 2.6 magnitude.

Those two objects are so much more than just two lights in the sky, but that is true of all stars and planets. We still have much to learn about our natural lights in the night sky.

I looked outside again a little later to check on the much slower progress of the descending moon and Saturn. Dozens of sweetly sonorous bullfrogs had reclaimed the lake and a creature was gently shuffling through the woods nearby. A clumsy jet plane struggled

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Moon Phases

Aug 5
Last Quarter

Aug 12
New

Aug 20
First Quarter

Aug 28
Full

Moon Data

Aug 1
Uranus 2° south of
Moon

Aug 3
Moon at perigee

Aug 7
Mars 6° south
of Moon

Aug 18
Moon at apogee

Aug 21
Antares 0.7° north
of Moon

Jupiter 6° north of
Moon

Aug 27
Neptune 1.4° north
of Moon

Aug 30
Moon at perigee

The International Space Station and Space Shuttle "Continued from page 2"

across the sky with its typical sound as it lumbered through the thick air, wasting lots of precious jet fuel. Suddenly it seemed in great contrast to the light, uplifting, and inspiring totally silent sight of the earlier pair.

The ISS and Atlantis are actually falling around the earth, totally weightless and free in their orbits. Gravity and mass still exist, but no weight is experienced

by the astronauts or the vehicles. In the same way, our larger space ship earth, weighing in at 6 x10 to the 24 kilograms, orbits totally effortlessly and weightlessly around the sun at 18.6 miles per second all the time.
No fuel required!

A five-year-old child once said to me, "Heaven begins where the sky ends." We are now at that critical boundary between the sky and heaven. Either we can use our fine technology for evil and to fight wars against our fellow passengers on "Spaceship Earth", or we can cooperate, honor our interdependency, and reach for the heavens. We all have an individual and collective choice to make.

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The below photo was taken by Paul Kursewicz



I took this photo on June 20th shortly after 9:20pm. Used a Nikon D100 digital camera on a fixed tripod and a 50mm lens. The exposure length was 5 seconds. Pointing the camera Southeast, I snapped a rare view of the International Space Station (brighter streak below) and the Space Shuttle Atlantis (upper streak) orbiting in tandem. The two were visible for about 3 minutes with the Space Station leading the way from the West-Northwest direction.

**Principal
Meteor
Showers in
2007**

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

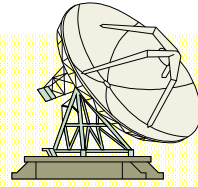
November 18
Leonids

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/asnne

All money raised goes to our operating fund.

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



Staggering Distance

By Dr. Tony Phillips

Tonight, when the sun sets and the twilight fades to black, go outside and look southwest. There's mighty Jupiter, gleaming brightly. It looks so nearby, yet Jupiter is 830 million km away. Light from the sun takes 43 minutes to reach the giant planet, and for Earth's fastest spaceship, New Horizons, it's a trip of 13 months.

That's nothing.

Not far to the left of Jupiter is Pluto. Oh, you won't be able to see it. Tiny Pluto is almost 5 billion km away. Sunlight takes more than 4 hours to get there, and New Horizons 9 years. From Pluto, the sun is merely the brightest star in a cold, jet-black sky.

That's nothing.

A smidgen to the right of Pluto, among the stars of the constellation Ophiuchus, is Voyager 1. Launched from Florida 29 years ago, the spacecraft is a staggering 15 billion km away. It has traveled beyond all the known planets, beyond the warmth of the sun, almost beyond the edge of the solar system itself.

Now that's something.

"On August 15, 2006, Voyager 1 reached the 100 AU mark—in other words, it is 100 times farther from the Sun than Earth," says Ed Stone, Voyager project scientist and the former director of NASA's Jet Propulsion Laboratory. "This is an important milestone in our exploration of the Solar System. No other spacecraft has gone so far."

At 100 AU (astronomical units), Voyager 1 is in a strange realm called "the heliosheath."

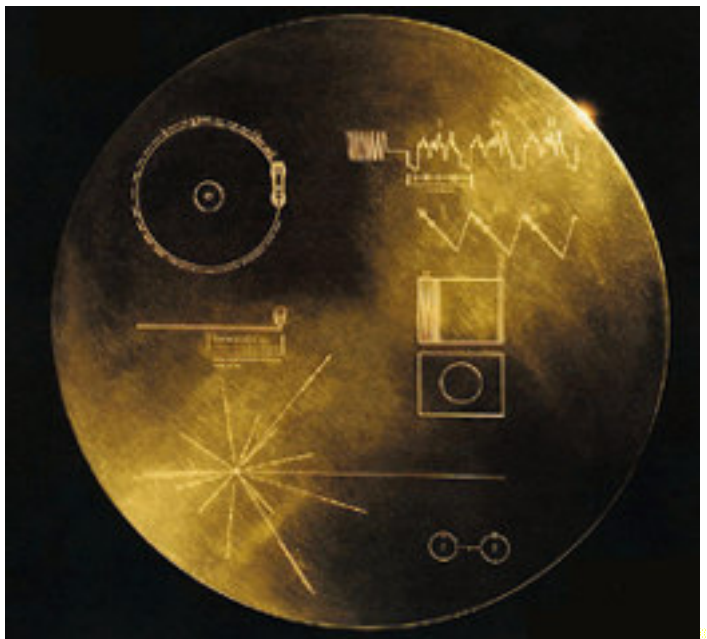
As Stone explains, our entire solar system—planets and all—sits inside a giant bubble of gas called the heliosphere. The sun is responsible; it blows the bubble by means of the solar wind. Voyager 1 has traveled all the way from the bubble's heart to its outer edge, a gassy membrane dividing the solar system from interstellar space. This "membrane" is the heliosheath.

Before Voyager 1 reached its present location, researchers had calculated what the heliosheath might be like. "Many of our predictions were wrong," says Stone. In situ, Voyager 1 has encountered unexpected magnetic anomalies and a surprising increase in low-energy cosmic rays, among other things. It's all very strange—"and we're not even out of the Solar System yet."

To report new developments, Voyager radios Earth almost every day. At the speed of light, the messages take 14 hours to arrive. Says Stone, "it's worth the wait."

Keep up with the Voyager mission at voyager.jpl.nasa.gov. To learn the language of Voyager's messages, kids (of all ages) can check out spaceplace.nasa.gov/en/kids/vgr_fact1.shtml.

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



Caption:
In case it is ever found by intelligent beings elsewhere in the galaxy, Voyager carries a recording of images and sounds of Earth and its inhabitants. The diagrams on the cover of the recording symbolize Earth's location in the galaxy and how to play the record.

Club Meeting & Star Party Dates

Date	Subject	Location
August 3 7:30 PM	The <i>regular club</i> meeting will be held at 7:30pm. Topic: Astro Imaging . Possible observing at Starfield Observatory after meeting.	Masonic Hall West Kennebunk, Me. NOTE: Beginner classes will be held from 6:30 PM to 7:15 PM.
August 15 7:00 PM	ASNNE Business Meeting. Anyone is invited.	Masonic Hall West Kennebunk, Me.
August 17 Dusk	Open Observing Session with rain/cloud date of 8/18 (New Moon 8/12).	Starfield Observatory, West Kennebunk, Me.
August 25 9:00AM - 3:00PM	ASNNE Auction and Raffle drawing. Donate stuff to the auction! (No heavy furniture, TV's or major appliances).	Masonic Hall West Kennebunk, Me.
Sept. 7 7:30 PM	The <i>regular club</i> meeting will be held at 7:30pm. Topic: Galaxies . Possible observing at Starfield Observatory after meeting.	Masonic Hall West Kennebunk, Me. NOTE: Beginner classes will be held from 6:30 PM to 7:15 PM.
Sept. 14-16	ASNNE Starfest Weekend!	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>

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

2007 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 _____

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