

SKYLIGHTS

Newsletter of the Astronomical Society of Northern New England



June 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 June

by *Bernie Reim*

Summer returns once more to the Northern Hemisphere on June 21 at 8:26 a.m. EDT. Known as the summer solstice, this marks the minute that the sun crosses its farthest-north point on the ecliptic. This also marks the day that the sun will rise farthest north of east and set farthest north of west.

The word solstice means "sun stands still", which is what it appears to do before it begins descending again and our days get progressively shorter until winter starts on December 21.

The highlights for this June include a great conjunction of Saturn and Mars as they buzz through the Beehive star cluster, Jupiter just past its best for the year, and the brightest planet, Venus, close to another star cluster, the Pleiades in the morning sky.

Mars has been noticeably closing the gap on Saturn all year long. The Red Planet will finally catch up with the Ringed Planet on Saturday evening, June 17th. At only half a degree apart, which is the width of the sun and the full moon in the sky; this is the closest these two planets have been in nearly 30 years. As an added bonus, the pair will not just meet anywhere on the ecliptic, but right in the Beehive star cluster in the constellation of Cancer.

This easily visible open cluster of about 200 stars known since prehistoric times, the Beehive, also known as Praesepe, or the Manger, is located about 600 light years away. That means the light we see this month as we admire the diffuse glow of this group of stars actually left there around 1400, when the Mayan and Aztec cultures were still flourishing before the Spanish conquest and about 100 years before Columbus landed in the Caribbean.

The stars in the Beehive had a common origin with the Hyades star cluster, the V-shaped group of stars that mark the face of Taurus the Bull. Both of these clusters were

born in the same great diffuse nebula about 700 million years ago. That is quite young for stars, since our own sun and earth are about 7 times that old. However, the earth was a very different place back then. That was towards the end of the pre Cambrian period when only primitive, invertebrate life existed, like jellyfish and worms, and only in the ocean. Nothing was alive on the parched, alien land of Earth except the wind.

An explosion of life on Earth started just after that. It may have been triggered by the breakup of Rhodinia, a super continent well before Pangaea, and another reversal of magnetic polarity.

Knowing the distances and ages of other stars in the sky helps us to appreciate the long and difficult path that life had to endure on Earth to evolve into what we see and take for granted today.

Mars is catching up with Saturn at the rate of half a degree per day. Mars will be right in the center of the Beehive on the 15th, but it won't catch up with Saturn until 2 nights later. Notice that golden Saturn is about 3 times brighter than orange Mars. The pair will be

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Astronomical League Message

How can I learn more about the Astronomical League?

Amateur astronomers from across the country benefit from perusing the many pages of the Astronomical League's website, www.astroleague.org. Naturally, this is the place to go if you're looking for information about upcoming events and League news. But there is so much more...

Want to learn all about one of the great League observing programs? Go to www.astroleague.org/observing.html.

Do you know of a worthy candidate for one of the many League awards? Look at <http://www.astroleague.org/al/awards/awards.html>.

Are you interested in buying a particular book about our fascinating hobby? Then go to www.astroleague.org/al/bookserv/bookserv.html.

There is even something to help your club function better. Try www.astroleague.org/al/socaid/socaidid.html

Make the most of your Astronomical League membership! **To find out more about what the Astronomical League offers you, why not log on to www.astroleague.org today?**

*John Jardine Goss
Astronomical League, Secretary*

Editor's Note: As a member of ASNNE, you are also a member of the Astronomical League. The leagues quarterly magazine, the "Reflector" will be mailed to you. If you are not receiving it, notify one of the officers.

Telescopes For Sale



FOR SALE:

Edmund AstroScan 4.25" Reflector Telescope with a brand new Universal Astronomics Tripod; Rigel Quick-Finder LED "Bullseye" 1X Finder; Plossl eyepiece; Carry/Storage Bag. This is a really nice "rich field" telescope, easy to carry and very quick to set up. A true "grab and go" scope that is great for star parties. Excellent condition. \$325.00

Discovery Telescopes 8" f/6 Dobsonian Reflector with Premium Optics Upgrade, it is virtually brand new!! Comes with a new Telrad 1X LED Finder; dust covers for both ends of the OTA; 3 Plossl eyepieces plus a 2X Barlow lens. The focuser on this scope is very smooth. This package sold for \$700 new and it's still like new, will sell for \$375.00

OR buy both for \$650, pick up only in Wells, Maine

Contact: Tim Brown at 207-646-4675 or zawijava@maine.rr.com

Moon Phases

June 3
First Quarter

June 11
Full

June 18
Last Quarter

June 25
New

Moon Data

June 3
Moon at apogee

June 7
Spica 0.1° south
of Moon

June 8
Jupiter 5° north
of Moon

June 15
Neptune 3° north
of Moon

June 16
Moon at perigee

June 17
Uranus & Mars
0.6° north of Moon

June 22
Venus 6° south of
Moon

June 27
Mercury 5° south
of Moon

June 28
Saturn 3° south
of Moon

Your Telescope, A Time Machine

by Joan Chamberlin

Want to “wow” your star party visitors in an astronomical way? Would you like to totally awe them, make them think beyond “isn’t that pretty”, or introduce them to a concept that is probably new to many of them? If you answered yes to any of these questions, this simple NASA Night Sky Network activity is for you. Your visitors will see the objects you show them in a whole new light!

When you are at your telescope at the next Star Party, explain to your visitors that they will be taking a trip back in time. Light travels at 186,000 miles per second, just a snap of your fingers really. You should go over the meaning of a light year, explaining that a light year is the distance that light can travel in one year. At 186,000 miles per second that distance is about 6 trillion miles for one light year.

Now, ask them how long it takes for light to reach us from the sun. It takes 8 minutes, so we could say that the sun is 8 light minutes away. The moon is about 1.5 light seconds away. Light from the planets is light minutes or light hours away, depending on the planet’s distance away.

All of this is very interesting, but what really blows people’s minds is when you look at a distant star or galaxy and explain, for example, that the Andromeda Galaxy is 2.3 million light years away. The light you are looking at right now left that galaxy 2.3 million years ago and is just reaching you today. You have just traveled back in time 2.3 million years and are seeing this galaxy the way it looked 2.3 million years ago. This idea is something that many people have never been introduced to before, and it never fails to impress them.

It is also effective if you find out the age of someone in the group and can point out a star that is equal to that age in light years. For example, Vega is 25 light years away. If there is someone in your group who is 25, you can tell them that the light they are seeing now left Vega around their birthday, and they are seeing Vega the way it looked then.

It’s interesting to equate the time light left an object with something that happened on

Earth. You can equate solar system objects with things that people were doing 10 minutes ago or a few hours ago. For stars and objects in the Milky Way Galaxy, you will equate them to a few years to thousands of years. Light from other galaxies has traveled millions to billions of years. Some of the light that has traveled from distant galaxies started its travel before modern humans were on Earth, some before the time of the dinosaurs, and some even before the Earth existed.

Here is a list of some objects or stars you might be showing visitors and the distance in light years.

Sun	8 light minutes
Moon	1.5 light seconds

The planets- distances vary considerably depending on where the planet is in its orbit, but the closer planets are light minutes; those further out are light hours.

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Thank You...

Space Day in M.S.A.D. 55

By Joan Chamberlin

On May 4th several members of ASNNE did presentations in classrooms at South Hiram Elementary School, Baldwin School, and Fred Morrill School in Parsonsfield and hosted a Star Party for our communities. I would like to express my sincere appreciation to ASNNE members who gave so graciously of their time to make Space Day in my school district a success again. Without your help I could not have accomplished this, and the students, teachers, and parents of my district truly appreciated it. Joyce Brann, Ian Durham, Steve Innes, Bernie Reim, and I did classroom presentations. Joyce Brann, Steve Innes, Cal Stanley, Gene Dolley, Andy Raio, and I hosted the Star Party. Thank you all so much for your wonderful enthusiastic support.

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"

very low in the western sky, less than 20 degrees above the horizon by one hour after sunset.

Jupiter is still quite bright in Libra, about 10 times brighter than Saturn. Since it is just past opposition, the King of the Planets now rises just before sunset. A new, smaller, earth-sized red spot just formed on Jupiter. Called red spot junior, this may signal a planet-wide climate change on Jupiter.

Mercury will be visible during the last two weeks this month low in the western sky below Mars and Saturn, near Castor and Pollux in Gemini. Watch as a waxing crescent moon glides just above Mercury, Saturn, Mars, and then Regulus, the brightest star in Leo, during the evenings of June 26 through the 29th.

Brilliant Venus is the only morning planet. Our sister planet will be near another open star cluster, the Pleiades, or Seven Sisters, all month and the waning crescent moon will join the pair on the mornings of June 22 and 23, one hour before sunrise.

June 2. Saturn is half a degree due south of the center of the Beehive Cluster tonight.

June 3. First quarter moon is at 7:06 p.m. EDT. The moon is also at apogee, or farthest from Earth today at 404,081 km.

June 4. On this day in the year 2000 the Compton Gamma ray observatory, launched one year after the Hubble Space Telescope, was allowed to reenter our atmosphere, ending its short but highly successful life.

June 8. Jupiter will be 5 degrees north of the moon tonight one hour after sunset.

June 10. Antares, the brightest star in Scorpius, whose name means "rival of Mars", will be less than one degree above the moon tonight.

June 11. Full moon is at 2:03 pm. The June full moon is also called the Rose, Strawberry, or Flower Moon.

June 13. On this day in 1983, the first man-made object to ever leave the solar system, Pioneer 10, crossed over into interstellar space.

June 15. Mars is centered in the Beehive cluster this evening.

June 16. The moon is at perigee, or closest to Earth today at 368,920 km.

June 17. Mars is half a degree above Saturn this evening.

June 18. Last quarter moon is at 10:08 a.m.

June 20. Mercury is at greatest eastern elongation from the sun today and is 39% lit, similar to a waning crescent moon.

June 21. The summer solstice is at 8:26 a.m.

June 22. Venus is 6 degrees south of the moon this morning.

June 25. New moon is at 12:05 p.m.

June 26. Charles Messier was born on this day in 1730. He was a French astronomer who established the Messier catalog of 110 objects while searching for comets. If the object didn't move from night to night, it could not be a comet. He discovered many nebulae, star clusters, and galaxies. The Beehive star cluster is also known as M44 in his catalog.

June 30. On this day in 1908, an extraterrestrial chunk of rock about 200 feet across, probably a comet or asteroid, exploded five miles above Tunguska, Siberia with the force of 10 million tons of TNT, leveling 60 million trees in an area the size of Rhode Island. We were very lucky that it exploded over an uninhabited area and that it wasn't very big. The comet that probably caused the extinction of the dinosaurs 65 million years ago was fully 7 miles in diameter and made a crater 150 miles wide, just discovered off the Yucatan peninsula in 1991. We just found an asteroid named Apophis that is 1,000 feet wide and has a 1 in 6000 chance of hitting the earth on April 13, 2036.

Got any News?
Skylights welcomes your input.

Did You Know

▶ Alvan Clark and John Brashear both have Craters on the Moon and on Mars named after them.

▶ John Brashear contributed to the standardization of the 1 1/4" outside diameter eyepiece barrel. Since he made all of his eyepieces this way, other manufacturers adopted this measurement and still produce such eyepieces.

▶ At age 79, Brashear died to poisoning. His body is in a crypt below the Keeler Telescope at Allegheny Observatory, along with his wife. A plaque on the crypt reads: "We have loved the stars too fondly to be fearful of the night."

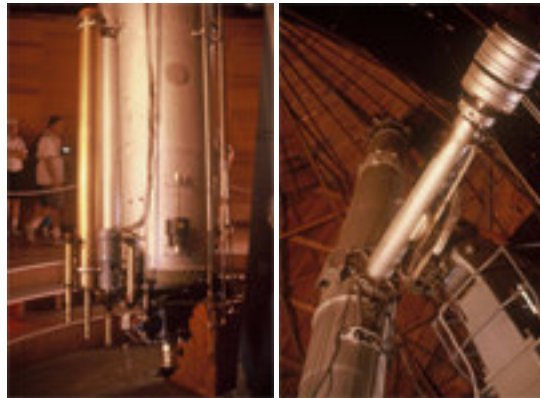
▶ When the senior Clark took a lens out for star testing, he'd defocus the image to check for errors, place some optical polishing rouge on his thumb, feel the error on the lens, and polish out the defect until the surface was perfect.

Classic Antique Telescopes

by Paul Kursewicz

Two Elite Telescope Makers *Alvan Clark & Sons* and *John Brashear* — two firms that produced some of the finest telescopes in their day. Many of these 19th and early 20th century telescopes still provide views that parallel (or even exceed) comparable modern telescopes.

The Clark's were especially known for their big refractors. They still hold the world record: the *40-inch Yerkes refractor* located in Williams Bay, Wisconsin; and its smaller sibling, the *36-inch Lick refractor* on Mount Hamilton in northern California.



The 24-inch Clark Refractor: *I took these photos at Lowell Observatory in Flagstaff, Arizona. The telescope and dome are still in good working condition and are used for public viewing nights.*

Brief History of Alvan Clark & Sons

Alvan Clark was an engraver and portrait painter. He became interested in optics at age 40, because of the Great Comet of 1843.

In 1846, in Cambridgeport, Mass, Alvan and his two sons established the firm *Alvan Clark & Sons*. The company created 400 instruments between 1859-1958. The first *achromatic lenses* made in the United States were produced there.

An *achromatic lens* is a two-element lens (called a doublet) that greatly reduces *chromatic aberration* (false color) in an optical system. Before the introduction of achromats, objective lenses of very long focal length were used in telescopes to reduce the aberration; this led to very cumbersome instruments.

The Clarks tested their optics on double stars. Hence, many double star discoveries are credited to them. In 1862, the younger Clark was testing the 18-inch Dearborn telescope when he discovered the first *white dwarf star* (called Sirius B).

A *white dwarf star* is the final phase in the evolution of a low-mass star. These stars have undergone gravitational collapse, are extremely dense & compact having a diameter about 1% of the Sun's — they are very faint.

Sirius B is a companion of *Sirius*, our brightest star in the sky (after the Sun) and one of the nearest stars to us. It is located in the Winter constellation *Canis Major*.

The Clark Telescopes have allowed scientist to discover the spiral arms of our galaxy, Mars' moons, and the 5th moon of Jupiter. The evidence of an expanding universe — that galaxies are moving away, would not have been possible without a Clark refractor.

Although Alvan Clark & Sons represented the pinnacle of 19th century telescope making, it wasn't alone. One firm in particular did nearly as well...the *John Brashear Company*.

Brief History of John Brashear

Brashear's interest in astronomy began when he was young, when his grandfather took him to look through a friend's telescope.

He did not have much money and could not purchase a telescope, so he built his own workshop and constructed his own instrument. His first scope was a 5-inch refractor.

In 1880 he dedicated his time to the manufacturing of astronomical and scientific instruments, and performed various experiments. He developed *silvering methods* that would become the standard for telescope mirrors, but never patented his techniques. He founded "*John Brashear Company*" and his instruments gained worldwide respect. The company survived and ultimately become part of today's *Contraves Inc.* (a state-of-the-art manufacturing facility with the most sophisticated optics capabilities in the world).

Like Alvan Clark & Sons, Brashear is credited for many small telescopes and several larger ones, such as the Dominion Astrophysical Observatory's 72-inch mirror in Victoria, British Columbia; Allegheny Observatory's 30-inch Thaw photographic refractor & the 30-inch Keeler Memorial reflector in Pittsburgh; and the University of Michigan's 37-inch mirror.

Club Meeting & Star Party Dates

Date	Subject	Location
June 02, 7:30 PM	Our Astronomy classes will be starting at 6:30pm. These are open to anyone. The regular club meeting will be held at 7:30pm. Topic TBD.	Masonic Hall West Kennebunk, Me.
June 23, Dusk	Open Observing Session with rain/cloud date of June 24th (New Moon on the 25th).	Starfield Observatory, West Kennebunk, Me.
July 07, 7:30 PM	The monthly Club Meeting. Topic TBD.	Masonic Hall West Kennebunk, Me.
July 21, Dusk	Open Observing Session with rain/cloud date of June 22nd (New Moon on the 25th).	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.

YOUR TELESCOPE, A TIME MACHINE *“Continued from page 3”****Stars***

Vega	25	Altair	16	Capella	41	Sirius	8.5
Betelgeuse	1400	Procyon	11	Rigel	1400	Acturus	32
Regulus	69	Deneb	1500	Fomalhaut	22	Pollux	40
Aldebaran	60	Antares	520	Spica	220	Mizar	78
Merak	79	Dubhe	100	Polaris	431		

Messier Objects-Globulars, Open Clusters, Nebulae

M1 Crab Nebula	6300	M2 Glob	36,800	M3 Glob	32,300
M4 Glob	9,000	M5 Glob	24,800	M6 Open Cl	2,000
M7 Open Cl	780	M8 Lagoon Neb	5, 150	M9 Glob	22,500
M10 Glob	14,300	M11 Wild Duck Cl	5,600	M12 Glob	17,900
M13 Hercules Glob Cl	23,500	M14 Glob	33,300	M15 Glob	30,600
M16 Eagle Neb	8,200	M17 Swan Neb	5,700	M18 Open Cl	4, 900
M19 Glob	34,000	M20 Trifid Neb	6, 650	M21 Open Cl	4,200
M22 Glob	10,100	M23 Open Cl	2,100	M24 asterism	16,000
M25 Open Cl	1,900	M26 Open Cl	5,100	M27 Dumbell Neb	980
M28 Glob	19,900	M29 Open Cl	4,100	M30 Glob	26,700
M34 Open Cl	1,400	M35 Open Cl	2,800	M36 Open Cl	4,100
M37 Open Cl	4,400	M38 Open Cl	4,300	M39 Open Cl	880
M41 Open Cl	2,300	M42 Orion Neb	1,550	M43 Diffuse Neb	1,550
M44 Beehive Cl	525	M45 Pleiades	400	M46 Open Cl	5,400
M47 Open Cl	100	M48 Open Cl	2,000	M50 Open Cl	3,000
M52 Open Cl	5,200	M53 Glob	55,400	M54 Glob	70,100
M55 Glob	17,000	M56 Glob	31,000	M57 Ring Neb	2,000
M62 Glob	19,600	M67 Open cl	2,600	M68 Glob	31,300
M69 Glob	33,600	M70 Glob	35,200	M71 Glob	18,000
M72 Glob	56,300	M75 Glob	59,300	M76 Little Dumbbell	3,600
M79 Glob	43,400	M80 Glob	27,100	M92 Glob	25,400
M93 Open Cl	3,600	M97 Owl Neb	1,300	M103 Open Cl	8,500
M107 Glob	19,200				

Messier Objects – Galaxies

M31 Andromeda	2,300,000	M32	2,300,000	M33 Pinwheel	2,400,000
M49	58,000,000	M51 Whirlpool	35,000,000	M58	58,000,000
M59	58,000,000	M60	58,000,000	M61	58,000,000
M63 Sunflower	35,000,000	M64 Black Eye	25,000,000	M65	29,000,000
M66	29,000,000	M77 Seyfert galaxy	60,000,000	M81 Bode’s Galaxy	7,400,000
M82 Cigar Galaxy	7,000,000	M83	10,000,000	M84	58,000,000
M85	40,000,000	M86	58,000,000	M87	58,000,000
M89	58,000,000	M90	58,000,000	M94	20,000,000
M95	29,000,000	M96	29,000,000	M98	35,000,000
M99	47,000,000	M99	47,000,000	M100	40,000,000
M101	15,000,000	M104 Sombrero	40,000,000	M110	2,300,000

The Night Sky Network has a leaflet that can be used by visitors at star parties for this activity. If you don’t want to bother with the leaflet, you can still do the activity without it. Try it out. Use your telescope as a time machine at our next star party!

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 _____

