

SKYLIGHTS

Newsletter of the Astronomical Society of Northern New England



May 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 May

by *Bernie Reim*

Our landscape is now being transformed by the tender green hues of spring. Take advantage of the warmer days to also enjoy the night skies above. This May holds much in store for us, including a trio of planets in the evening, a meteor shower, and even a strange comet that is still fragmenting into more pieces.

First discovered in May of 1930 by two German astronomers, Comet Schwassmann-Wachmann-3 broke into several pieces during its 1995 return, which caused it to become much brighter than expected. Belonging to Jupiter's family of about 100 periodic comets, SW-3 has a period of only 5.3 years.

Comets are not very dense and tend to break up quite easily, probably due to thermal stress as these "dirty snowballs", mixtures of ices, dust, and rock that didn't get incorporated into planets when the solar system formed 4.6 billion years ago, emerge from the near absolute zero temperatures of deep space into the warmer proximity of the sun.

The most famous of these is Comet Shoemaker-Levy-9, which broke into 21 pieces, each about a kilometer across, and then proceeded to smash into Jupiter every 6 hours over 6 days, starting on July 16, 1994. I was lucky enough to watch some of this extended event live through a good telescope for 3 of those 6 nights. I saw as many as 5 earth-sized black spots rapidly rotating around Jupiter, created by the tremendous energy of these huge chunks plunging deep into Jupiter's dense gaseous surface. I am sure the show would have been even more dramatic if this fragmented comet would have hit a solid planet like Mars.

Comet SW-3 has now fragmented into at least 40 pieces, and possibly as many as 100. Several of the fragments are now also breaking into more fragments, which make it all that much more exciting and unpredictable. The largest fragment is expected to pass very close to Earth on May 12th. At only 7.3 mil-

lion miles, this will be the closest a comet has passed to Earth since May of 1983, when Comet IRAS-Araki-Alcock passed just 2.9 million miles from Earth, or only 12 times the Earth-moon distance.

At least 2 of the larger fragments are expected to become bright enough to be seen without binoculars later this month. Several of us at the Astronomical Society of Northern New England have already seen the largest fragment back in early April near Arcturus through a good pair of binoculars. This fragment will pass right through the famous "Keystone" in Hercules, just below the Northern Hemisphere's brightest globular star cluster, also known as M13, which is visible with the unaided eye on a clear night, during the first few days this month. On Sunday night, May 7 around 10 pm, this fragment will pass right over the Ring Nebula, M57, located half way between the outer 2 stars in the parallelogram which is Lyra. M57 is a planetary nebula, which is an example of what our sun will look like when it finally runs out of fuel and explodes in about 5 billion years.

The largest fragment will continue through Cygnus the Swan and Pegasus the Flying Horse, but will get harder to see as the

"Continued on page 4"

Inside This Issue

2001: A Space Odyssey	pg 2
Club Contact List	
Observing Session Coordinators	
4 Mile Solar System Model, Star Party, and More...	pg 3
Meteor Showers in 2006	pg 4
The First Telescope	pg 5
Meeting & Star Party Dates	pg 6
Directions ASNNE Locations	
Become a Member	pg 8

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
scotttydog1@verizon.net

**Star Party
Co-ordinator:**

Ron Burk
ron.burk@yahoo.com

Skylights Editor:

Paul Kursewicz
pkursewicz@tlc.net

Website Managers:

Gerry McAuliffe
caide@maine.rr.com

Jim Hatch
nerdfulthing@earthlink.net

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

Joan Chamberlin
starladyjoan@yahoo.com

**ASNNE Observing
Session Coordinators****Schedule for 2006**

David Bianchi
dbianchi@verizon.net.....207-432-7373

Bill Grady
wgrady@adelphia.net.....207-985-8500

Tim Brown
zawijava@maine.rr.com.....207-646-4675

Mike Dostie
nate17@ghi.net.....207-353-2278

Ian Durham
idurham@anselm.edu207-985-1836

Kirk Rogers
krogers1@maine.rr.com.....207-797-4879

Rob Burgess
rburgess@suscom-maine.net207-729-6415

Joan Chamberlain
starladyjoan@yahoo.com207-625-8185

Cal Stanley
maggyandcal@juno.com.....207-892-8215

George Whitney
gwhitney@maine.rr.com.....207-878-3409

We need more volunteers to be Observing
Session coordinators.

E-mail me if you can at dbianchi@verizon.net

Joan Chamberlin and David Bianchi will al-
ternate informing everyone of our open ses-
sions starting with Joan in October.

2001: A Space Odyssey

Stanley Kubrick & Arthur C. Clarke
1968

Review by Richard Beaulieu

My wife and I decided to look again at a classic science-fiction movie.

The beginning shows hominids in what appears to be Africa, but they walk with bent legs, like the chimpanzees. Today, the paleontologists would say that we walked upright, just as we do now. Recent studies of the fossil leg bones and feet revealed to the experts that one of the first things our ancestors did was to walk upright.

The rest would pass for realistic today. They had hair like a chimpanzee, a face like a gorilla, and the setting, arid Africa, is where it should be.

A prehistoric Einstein begins to play with a bone and discovers that it can be used as a weapon, to hit the others with. This forgotten genius's tribe is able to fight off another tribe and keep the water hole.

It might have happened that way.

Pretty soon, the descendants of the hominids are on a space ship, heading for the moon and Jupiter.

A member of the team on the space ship is HAL, the computer that runs everything. The people talk to HAL with speech, and HAL understands and replies.

A couple of days ago, I spoke to Verizon's computer and it understood me and replied. Maybe it was Arthur C. Clarke that predicted speech recognition technology for computers. In another work, he predicted communication satellites.

This implies that maybe in a century or two, more of what is in the film will be realized.

Arriving at Jupiter is a psychedelic trip, with all of the visions and colors. The movie was made in the 1960's. And arriving at Jupiter is, magically, gaining immortality.

What the film does not explore is how hanging around an elegantly furnished room, all alone, for millions and millions of years would be hell, and not heaven.



Moon Phases

May 5
First Quarter

May 13
Full

May 20
Last Quarter

May 27
New

Moon Data

May 2
Mars 4° south of
Moon

May 4
Saturn 4° south
of Moon

May 7
Moon at apogee

May 10
Spica 0.3° south
of Moon

May 12
Jupiter 5° north
of Moon

May 19
Neptune 4° north
of Moon

May 21
Uranus 1° north of
Moon

May 22
Moon at perigee

May 24
Venus 4° south of
Moon

4 MILE SOLAR SYSTEM MODEL AND STAR PARTY

SPACE DAY AT MSAD 55

by Joan Chamberlin

Thursday, May 4th is Space Day. M.S.A.D. 55 which includes the towns of Parsonsfield, Porter, Baldwin, Cornish, Hiram, and South Hiram. The day includes presentations in the schools by members of ASNNE, solar system ambassadors from Massachusetts and New Hampshire, Channel 13 meteorologist Sarah Long, a female commercial pilot, presentations on solar energy and solar cell cars, and a portable planetarium. For the public of all towns in the district, there will be a star party that evening with ASNNE members showing the wonders of the night sky. Several days before Space Day and for about a week there will be a 4 mile solar system model on sign boards. Brochures to accompany the solar system ride will be available in businesses in the towns for the public to use. The following is the accompanying brochure. If any ASNNE members would like to enjoy this 4 mile quick trip through the solar system, please come check it out. All information needed is below:

MSAD 55 4 MILE SOLAR SYSTEM

Take a ride through our solar system. Begin at the SUN where Rt 25 meets South Hiram Rd in Cornish. Journey to PLUTO 4 MILES BEYOND IN PORTER, just before you reach School Street. Our solar system shows size and distance in space if the real solar system was shrunk to the distance of 4 miles and the sizes were also shrunk to fit this scale. We have compared the planets to fruit and vegetables because, in this scale, some of the planets are too small to see when you are driving past them.

In our scaled system, the Sun is 5 feet in diameter. We could fit 109 Earths across the face of the real Sun. Solar prominences can be 4 to 6 Earths high. The distance of Earth from the sun in this scaled model is 1/10 (0.1) miles. The real distance of Earth to the sun is 93 million miles, also called one Astronomical Unit or AU. Distances within the solar system are usually measured in AU's because, com-

pared to the stars, the planets are much closer to us. Of course they are still far away, but not light years. In our scaled model, Pluto is 3.9 AU's from the Sun. Proxima Centauri, the closest star to our solar system, is 27,483 miles away from us in this scale model. We would have to drive from Portland, Maine to San Francisco, California and back 5 times, to reach Proxima Centauri in our scaled model.

The Center of our Galaxy, the Milky Way, is 178,352,650 miles away on our scaled system. We would have to fly around the circumference of the Earth 7,162 times to reach that distance in our scaled model.

Notice how close to the Sun the rocky, terrestrial planets are-Mercury, Venus, Earth, and Mars. Notice their size compared to the gas giants, Jupiter and Saturn. Why do you think the terrestrial planets are closer and the gas giants are so far away from the Sun? Doesn't it seem odd that tiny Pluto is so far away? When you reach Pluto, think about Pluto, the size of a mustard seed and 4 miles from the Sun. I wonder how big the sun looks from Pluto.

Between Mars and Jupiter is the Asteroid Belt. We did not make a sign for it, but you can pretend that you are entering it. The Asteroids would be bits of dust in that much space. The chance of you hitting one is slim.

Beyond the orbit of Neptune is the Kuiper Belt, a disk-shaped region extending roughly 30 to 50 AU's from the Sun in the real solar system. In our model, it would extend beyond Pluto. This region contains many small icy bodies and is now considered to be the source of the short-period comets. New objects are being discovered in this region now that we have better telescopes that can see further and more clearly such as the Hubble Space Telescope. One recently discovered object is larger than Pluto. If we consider Pluto to be a planet, wouldn't this object logically be the 10th planet in our solar system? Could Pluto really be a Kuiper Belt object rather than a true planet? Since Pluto is the only planet discovered by an American, Clyde Tombaugh, I think it will retain its planetary status. But the Astronomical Union has yet to make a decision as to whether the new object will be considered a planet. They are working on a definition of what we will now use for an object to achieve planetary status. Who knows what new objects will be discovered out there in the

"Continued on page 7"

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"

moon gets brighter towards the middle of the month. The comet will reach perihelion, or closest approach to the sun on June 7, but it will already have started to fade out by then as it recedes from Earth.

The Eta Aquarid meteor shower peaks on Friday, May 5th into May 6th. Meteor showers are usually at their best just before dawn since the earth spins towards the meteors by then, and the first quarter moon will have set by 1 am. Caused by Halley's Comet, you can expect about 20 meteors per hour. This is actually one of the best meteor showers in the southern hemisphere, at 60 per hour, because the radiant in Aquarius is much higher there.

A comet will lose millions of tons of material, to a depth of about 20 feet, each time it orbits the sun, which is every 76 years for Halley's Comet. All this debris gets spread out along its orbit when near the sun, and the earth passes through the trail every year. In the case of Halley's Comet, we actually pass through it again on October 21st, when the Orionids take place.

Thousands of sand grain-sized and smaller pieces of this famous comet will disintegrate high in our protective atmosphere as they smash into it at 40 miles per second. However, we will only be able to see the brighter ones.

The King of the Planets, Jupiter, is at its best for the year on May 4, when it reaches opposition. It will rise at sunset and remain in our sky all night long for most of the month. Glowing with a creamy-white light at minus 2.5 magnitude, Jupiter is 4 magnitudes or about 40 times brighter than Mars now.

The second largest planet, Saturn, is still bright at just fainter than zero magnitude, but it has been fading since its opposition in late January. Watch as the softly glowing golden light of the ringed planet continues in prograde motion, carrying it right back through the nearby Beehive star cluster early next month.

Mars, now in Gemini, is rapidly catching up with Saturn. The red planet will line up directly below Castor and Pollux later this month, and will be within half a degree of Saturn on June 17th, just before summer starts.

May 1. On this day in 1949, Gerard Kuiper, after whom the Kuiper Belt of thousands of Pluto-like objects is named, discovered

Nereid, the second largest moon of Neptune. Comet Hyakutake made its closest approach to the sun 10 years ago today.

May 2. The waxing crescent moon will be near Mars tonight around 10 pm.

May 3. The moon will be near Saturn tonight.

May 5. First quarter moon is at 1:13 am EDT. Eta Aquarid meteor shower peaks.

May 7. The moon is at apogee, or farthest from Earth at 404,572 km.

May 10. The waxing gibbous moon will be just below Spica this evening.

May 11. The moon is near Jupiter tonight.

May 13. Full moon is at 2:51 am. The May full moon is also called the Flower, Milk, or Planting Moon.

May 14. Antares, whose name means "rival of Mars" and the brightest star in Scorpius, will be less than one degree north of the moon tonight. On this day in 1973, our first space station, Skylab, was launched.

May 20. Last quarter moon is at 5:21 am.

May 22. The moon is at perigee today at 368,609 km.

May 27. New moon is at 1:26 am.

May 28 to 31. The waxing crescent moon will be just above Mercury, then Mars, and then Saturn on these evenings.

May 29. Einstein's General Theory of Relativity passed its first major test on this day in 1919 during a total solar eclipse.

Got any News?

Skylights welcomes
your input.

Did You Know

► The term *telescopio* [from the Greek *tele* ("far") and *scopeo* ("I see")], from which the English word "telescope" is derived, was coined in 1611 by Prince Federico Cesi, founder of the Accademia dei Lincei.

► Christian Huygens (1629-1695) was a Dutch physicist and astronomer who developed new methods for grinding & polishing glass telescope lenses. With his new powerful telescopes, he discovered Titan, the largest moon of Saturn in 1655.

Huygens also invented the pendulum clock in 1656 (eliminating springs), wrote the first work on the calculus of probability, and proposed the wave theory of light.

► Galileo designed ingenious accessories for the telescope. One of the most important was the micrometer, an indispensable device for measuring distances between Jupiter and its moons.

The First Telescope

by Paul Kursewicz

Who invented the telescope? Let me begin by saying that the first telescope was probably the product of craftsman, and not the invention by scientists. Phoenicians cooking on sand discovered glass around 3500 B.C., but it took about 5,000 years more for glass to be shaped into a lens for the first telescope.

Lenses as we know them were introduced in the West at the end of the thirteenth century. Magnifying glasses became common during this period and were used for reading and writing. Craftsmen in Venice began making small disks of glass (convex on both sides), that could be worn in a frame. Because these little disks were shaped like lentils, they became known as "lentils of glass," or (from the Latin) *lenses*. So by about 1450 the ingredients for making a telescope were there.

Leonard and Thomas Digges living in England in the 1570s may of made an instrument consisting of a convex lens and a mirror. However, a spectacle maker named **Hans Lipperhey** of Holland is often credited with the invention of the first telescope.

Lippershey's Telescope

Lippershey's telescope was unveiled in the Netherlands on October 1608. The national government in The Hague discussed a patent application for Lipperhey's device which was for "*seeing far away things as though nearby*." His telescope consisted of a convex and concave lens in a tube, and the combination magnified 3 or 4 times. However, the device was too easy to copy and no patent was awarded. But Hans received a small award and was asked to make several binocular versions.

It appears that another citizen named Sacharias Janssen, had a telescope at about the same time but was at the Frankfurt Fair where he tried to sell it. But it was Lipperhey's telescope that first made the new device widely known.

News of the telescope spread throughout Europe. By April 1609, three-powered *spy-glasses* could be bought in spectacle maker's shops. Thomas Harriot observed the Moon with a six-powered instrument early in August 1609. But it was **Galileo Galilei** who made the instrument famous.

Galileo's Telescope

Galileo constructed his first three-powered spyglass in June or July 1609. He mounted two lenses at the ends of a lead tube, and his first telescope came into being. He presented an eight-powered instrument to the Venetian Senate in August. He then turned a twenty-powered instrument to the heavens in October.



Above: A replica of Galileo's telescope. I purchased this item from a swap table at the Stellafane Convention (only \$20 with box).

With this instrument Galileo observed craters on the Moon, discovered four large satellites of Jupiter (today called *Galilean Moons*), resolved nebular patches into stars, studied sunspots on the Sun, discovered the rings of Saturn, and watched Venus go through various phases.

Of the more than 60 telescopes known to have been personally constructed by Galileo and his workshop assistants only two survive, one of 14x and the other of 21x. They are both kept at a museum in Florence, Italy.

Galileo's telescopes and others that followed: <http://www.imss.fi.it/news/cielimedicei/01/strumento2.html>

Galileo's discoveries were not easy to verify. That's because in the spring of 1610, no one had telescopes of sufficient quality and power to see the satellites of Jupiter. It took about six months before others could make or obtain instruments good enough to see Jupiter's moons.

In 1704, Sir Issac Newton announced a new concept in telescope design whereby instead of glass lenses, a curved mirror was used to gather in light and reflect it back to a point of focus. This reflecting mirror acts like a light-collecting bucket: the bigger the bucket, the more light it can collect.

The reflector telescope that Newton designed (now called a Newtonian telescope) opened the door to magnifying objects millions of times--far beyond what could ever be obtained with a lens.

Club Meeting & Star Party Dates

Date	Subject	Location
May 05, 7:30 PM	Our Astronomy classes will be starting at 6:30pm. Club member Joan Chamberlin will teach the class. These are open to anyone, so get the word out. The regular club meeting will be held at 7:30pm (with the drawing for the telescope). Please bring in your sold tickets for the drawing.	Masonic Hall West Kennebunk, Me.
May 26, 8:30 PM	Open Observing Session with rain/cloud date of May 27nd (New Moon).	Starfield Observatory, West Kennebunk, Me.
June 02, 7:30 PM	The monthly Club Meeting. Topic TBD.	Masonic Hall West Kennebunk, Me.
June 23, 8:30PM	Open Observing Session with rain/cloud date of June 24th (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.

4 MILE SOLAR SYSTEM... "Continued from page 3"

Kuiper Belt in the next few years!

Even further out beyond Pluto is a region of long period comets called the Oort Cloud. We don't know as much about this region.

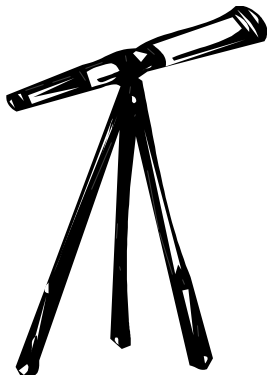
This is our solar system- A Sun and (8, 9, or 10?? planets). But these are not the only planets in the Universe. Right here in our own Milky Way Galaxy astronomers are finding planets orbiting other stars. As of April, 2006, astronomers have found a total of over 160 planets orbiting other stars. They have even found planetary systems. Many of these planets are Jupiter-sized and orbit close to their host star. That doesn't mean that there aren't Earth-sized planets out there. Finding Earth-sized planets will take better technology and space based telescopes. NASA is working on this and a fleet of new Space Telescopes will be launched in the future. Currently the Keck Interferometer, a ground based telescope which is able to null starlight to reveal regions where planets may have formed, is

being used. If NASA's science budget is not cut, NASA will be launching SIM in 2011, the Terrestrial Planet Finder in 2014 and 2020 and the Kepler in 2008. For more information about these exciting missions to look for Earthlike planets, go to this website:

<http://planetquest.jpl.nasa.gov>

If you would like to see a star that astronomers have found planets around, be sure to come to the MSAD 55 STAR PARTY ON THURSDAY, MAY 4TH AT DUSK AT SOUTH HIRAM ELEMENTARY SCHOOL.

Amateur astronomers from the Astronomical Society of Northern New England and the Greater Portland Astronomical Society will be there with telescopes to show you the wonders of the night sky. Come see Saturn, the moon, a cometary fragment, star clusters, and Jupiter, if you stay late enough.



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 _____

