

SKYLIGHTS

Newsletter of the Astronomical Society of Northern New England



April 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 April

by *Bernie Reim*

The Romans named this month Aprilis, which means "to open". Buds will open up once again as much of the Northern Hemisphere begins to awaken this month.

There will be several highlights to enjoy this month as the weather begins to get warmer. These include three evening planets, the Lyrid Meteor Shower, and a spectacular occultation of the moon and the Pleiades star cluster.

Two of the three evening planets will also be close to star clusters this month. Mars is now rapidly catching up with Saturn to the east. These two planets will be less than a half a degree apart on June 17th, just before summer starts.

Mars continues to fade even as it keeps forming an ever-changing triangle with two bright golden-orange stars just below the red planet. Last month Mars formed a right triangle with Aldebaran in Taurus directly below it and Betelgeuse in Orion to the east. This month, on April 17th, Mars will be directly above Betelgeuse and it will also be right next to the sprawling open star cluster called M 35 in Gemini. Containing about 300 stars located 2700 light years away; this cluster will show up nicely in a pair of binoculars.

Saturn, which will end its retrograde, or westward motion away from the Beehive star cluster in Cancer on April 5th, will spend the rest of the month drifting closer to the Beehive again. Saturn will become the brightest bee in the Beehive cluster in June, when Mars will also join it in this great star cluster of about 350 stars located only 600 light years away.

NASA just discovered that Enceladus, a moon of Saturn which is only 300 miles in diameter, has a very thin atmosphere of water vapor. Since it is so small and has so little gravity, Enceladus was not expected to be able to hold onto an atmosphere. Its tenuous atmosphere is created by ice volcanoes and

geysers continually dumping icy particles onto this moon's surface. This makes Enceladus the most reflective object in our entire solar system, reflecting 90% of the sunlight that hits it.

Jupiter is the only evening planet that will not be near a star cluster anytime this month. The King of the Planets is the last one of the trio to appear in our sky, being farthest to the east. Jupiter starts the month rising an hour after the end of evening twilight, but will end the month rising just after sunset. Jupiter will reach opposition, when it rises at sunset and is closest to Earth, on May 4th, the night before the Eta Aquarid Meteor Shower caused by Halley's Comet.

If you look at Jupiter with a pair of binoculars, you should be able to see at least 2 of its four large Galilean moons. First seen by Galileo in 1610, they are Ganymede, Callisto, Io, and Europa.

Jupiter will pass one degree above a wide double star in Libra later this month. With the

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Solar days
April 2

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.



Don't Forget!
Saturday, April 8th
is our monthly
meeting. Not Friday.

"SciJinks"

Why is the sky blue? Why does the sky sometimes turn red at sunset? Every curious child will ask these question at some point. Are you ready to give scientifically correct and simple answers? Visit SciJinks to refresh your memory. The SciJinks Web site targets young people of middle school age. It is a joint effort of the National Aeronautics and Space Administration (NASA) and the National Oceanic and Atmospheric Administration (NOAA). The new "Why is the sky blue?" page can be found in the How & Why menu on the SciJinks Weather Laboratory home page,

scijinks.gov

Nancy Leon
Education and Public Outreach Lead
NASA New Millennium
Program/Space Place

Moon Phases

Apr. 5
First Quarter

Apr. 13
Full

Apr. 20
Last Quarter

Apr. 27
New

Moon Data

Apr. 3
Mars 4° south of
Moon

Apr. 6
Saturn 4° south
of Moon

Apr. 9
Moon at apogee

Apr. 15
Jupiter 5° north
of Moon

Apr. 22
Neptune 4° north
of Moon

Apr. 23
Uranus 1.2° north
of Moon

Apr. 24
Venus 0.5° north of
Moon

Apr. 25
Moon at perigee

Apr. 26
Mercury 4° south
of Moon

ADDING A NEW DIMENSION TO STAR PARTIES

by Joan Chamberlin

Saturn is a popular target in telescopes right now at star parties. Nothing seems to get more expressions of surprise and wonder than a glimpse of Saturn's majestic rings. Expressions of "wow" and "cool" are common. My favorite response is, "Get out of here! That's not really Saturn. You stuck a picture of it in the telescope, didn't you?"

Mars is now a tiny disc and won't get much of a response from your audience; but, as the months proceed, Jupiter will wander into view earlier in the evening. This giant planet with the four highly visible moons awes audiences.

Viewing the planets of our solar system offers a perfect opportunity to add a new dimension to your star party. After looking at Saturn or Jupiter, ask your audience, "How many planets are there?" The usual response is nine or even ten. Now you have a lead into a new dimension. Explain that for centuries we only knew about the planets in our solar system, but now we know that there are many more planets. These planets are around other stars in our Milky Way Galaxy.

Gamma Cephei, the star that is at the tip of the roof of "the house" in the constellation Cepheus, is the easiest star to show people. It is visible with the naked eye at 3.225 magnitude and, since Cepheus is circumpolar, it can be found all year. Point out this star and tell them a little about what scientists have discovered about this system.

Gamma Cephei is a binary star, which is 39 light years from us. It is a red giant. Its small companion star gets as close as 12 AU (Astronomical Units) to the giant star in a 40 year orbit. The red giant star's temperature is around 5000 degrees Kelvin, a bit cooler than our sun. The planet, Gamma Cephei b, is 2 AU from its host star, has an orbital period of 2.5 years and a mass of about 1.8 Jupiters.

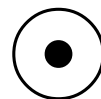
You could tell your audience that the current count of planets located around other stars in our galaxy is 160. Nearly all the planets found thus far are massive planets like

Jupiter or Saturn and are orbiting quite close to their host stars. Often their orbits are highly eccentric. We are not yet able to detect the wobble that Earth-sized planets make on their stars, but NASA is working on a fleet of telescopes to be launched into space in the future that will be able to detect the tiny wobble that Earth-sized planets make on their stars. The first mission scheduled to be launched is the Kepler Mission, which is scheduled to launch in 2008. This telescope will search for earth-sized planets using the transit method.

In 2011, NASA hopes to launch SIM (Space Interferometry Mission), which will be able to detect Earth-sized planets using the wobble method. In 2014, NASA has planned to send out the first of two telescopes that will work with another telescope to be launched in 2019, to form the Terrestrial Planet Finder. This combination of telescopes will be able to null the starlight of the host star so that planets the size of Earth can be directly studied by analyzing the light from that planet to determine the composition of its atmosphere and whether there are biosignatures that could mean life on that planet.

The NASA Night Sky Network has some terrific tools to bring this alien planet dimension alive. There are star maps for each month, which show where to find some of these stars where planets have been found. You can photocopy these to give out to star party guests. There are also planetary post cards that tell information about the host star and the planet mass, average distance from the star, eccentricity, and orbital period. All of this can be downloaded from the Night Sky Network website, if you sign up to be a participant. If you would like to become a participant, give Joan your name, email address, and telephone number. She will log in your information and the Night Sky Network will notify you about your password.

Step into a NEW DIMENSION! Start showing those other planets lurking out there in the Milky Way. You'll be surprised how many people don't know that there are other worlds out there. Maybe some kid will be motivated by your other-worldly show to become a scientist someday and discover more planets!



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"

colorful name of Zubenelgenubi, meaning "southern claw" in Arabic, notice that you can see two stars there with binoculars, located nearly one light year apart and 77 light years away. The other bright star in Libra is called Zubeneschamali, which means "northern claw". These two stars formed the claws of Scorpius before it was renamed for Libra the Scales. Libra is the only constellation in the zodiac not named after an animal.

Brilliant Venus is the only morning planet. Through a telescope you will see that Venus is just over half full now, similar to a waxing gibbous moon. It is well passed its brightest for the year as it speeds ahead of Earth around the sun, but at minus 4th magnitude, it is still 100 times brighter than Mars.

The annual Lyrid Meteor Shower peaks on Saturday morning, April 22nd, around 3 am. Since the moon will be a couple days past last quarter, it will not interfere until it rises just after 3 am. Caused by Comet Thatcher, this shower usually only produces 10 to 20 meteors per hour. These sand grain-sized pieces of comet dust will disintegrate high in our atmosphere, moving right along at 30 miles per second.

Early Saturday evening on April 1st, the thin waxing crescent will pass right over the Pleiades star cluster. The six brightest stars that you can see without binoculars are named Alcyone, Atlas, Electra, Maia, Merope, and Taygeta. From some locations, the moon will just graze over one of these stars. This is created by the light of the star shining through the valleys between the mountains on the moon, making the star blink on and off several times instead of just going out. I saw such a graze occultation once on the first day of spring about 15 years ago.

April 2. The first photograph of the sun was taken on this day in 1845.

April 3. Mars will be just 4 degrees south of the waxing crescent moon this evening.

April 5. First quarter moon is at 8:01 a.m. EDT. Saturn ends its retrograde motion today and starts its normal, prograde, eastward motion again. Pioneer 11 was launched on this day in 1973. The moon passes directly below Castor and Pollux in Gemini tonight.

April 6. The waxing gibbous moon passes four degrees north of Saturn tonight.

April 7. The Compton Gamma Ray Observatory was deployed on this day in 1991; about one year after the Hubble Space Telescope was deployed on April 25 of 1990. It discovered many amazing things about our universe in extremely high energy gamma rays, including nearly one powerful burster per day that originated way beyond our galaxy that baffled scientists until they developed some plausible models to explain such huge amounts of concentrated energy from such vast distances. They ran out of funding for that mission, and allowed it to safely crash back to earth on June 4, 2000.

April 9. The moon is at apogee, or farthest from Earth today at 405,551 km.

April 11. Halley's Comet's closest approach to Earth was on this day in 1986. Its next close approach will be in 2062.

April 13. Full moon is at 12:40 p.m. This is also called the Grass, Pink, Seed, or Egg Moon.

April 14. The moon will be near Jupiter tonight.

April 15. Wilbur Wright was born on this day in 1867. Just 66 years after their first powered flight in Kitty Hawk in 1903, we actually sent two men to the moon.

April 20. Last quarter moon is at 11:28 p.m.

April 22. The Lyrid Meteor Shower peaks this morning.

April 24. Venus is very close to the moon this morning.

April 25. The moon is at perigee, or closest to earth today at 363,731 km.

April 27. New moon is at 3:44 p.m.

April 28. Jan Oort was born on this day in 1900. The Oort cloud, where all the comets originate at the fringes of our solar system, is named after him.

Got any News?

Skylights welcomes
your input.

Did You Know

► The word comet comes from the Greek word *kometes* which means: “**the hairy one.**” These “Hairy Stars” were thought to be *bearers of death* and heralded important changes.

Ironically, many of today’s scientists now see comets as *bearers of life*. But, should such *beliefs* be accepted as being scientific?

► The earliest records of cometary observations date from around 1000 B.C. These came from China and Chaldea (part of the territory of present day Iraq).

► Comets are classified by their orbital periods.

Short period comets are thought to generate in the Kuiper belt and have rather predictable orbits with periods up to 200 years. There are two major families: the *Jupiter family* with periods of less than 20 years & the *Halley family* with periods from 20 to 200 years.

Long period comets, on the other hand, are thought to generate in the Oort cloud and have periods much longer than 200 years.

Brief History of Comets

by Paul Kursewicz

Last month I talked about observing comets with a pair of binoculars. This month, I briefly talk about the history of these *hairy stars* (as the ancients called them).



Four major periods:

1.) Before the 1600’s, comets were essentially considered to be heavenly omens and were not yet established as celestial objects.

As time passed, comets were regarded as atmospheric phenomena until 1577, when the Danish astronomer Tycho Brahe proved that they were celestial bodies.

2.) Then came two centuries of positional measurements (emphasis on motions and orbits) which lasted until the beginning part of the 19th century.

In the 17th century Isaac Newton demonstrated that the movements of comets are subject to the same laws that control the planets in their orbits. By comparing the orbital elements of a number of earlier comets, Edmond Halley showed the comet of 1682 to be identical with the two that had appeared in 1607 and 1531, and he successfully predicted the return of the comet, which reappeared in 1758.

3.) The next step occurred in 1950. Comets were now seen as very old solar system objects made of primordial ice and dust.

During this period, three fundamental ideas came about: **1)** the icy conglomerate (dirty snowball) model of the cometary nucleus by Fred Whipple, **2)** the identification of the existence of a distant reservoir of comets, now known as the Oort cloud, by Jan Hendrik Oort, and **3)** the explanation of the motions in cometary plasma tails as due to interaction with the solar wind by Ludwig Biermann.

4.) And finally, the space missions to the comets themselves. These and other telescopic observations dramatically widened our scientific horizon, but also posed many new questions yet to be answered.

Today, astronomers are finding out that comets are not the pristine relics we thought they were. This shift away from seeing comets as completely pristine samples of the solar system’s earliest days, began in the 1970s. Scientists now see comets as somewhat damaged goods that have sustained numerous different evolutionary processes.

Did Comets Make Life on Earth Possible?

In doing my research on the history of comets, I ran across the above question on the National Geographic News (NGN) website.

NGN’s article begins with these words: “An ambitious new NASA research project aims to answer perhaps the most vexing and profound of scientific mysteries: How did life on Earth begin?” **Scientific mysteries???**

What Happened to Real Science?

For something to be scientific...it must at least be *observable*, and or *testable*. We cannot *observe* how life began on our planet. No repeatable *laboratory test* can show how life got it’s start, and then....evolve into intelligent creatures such as ourselves. Therefore, it is “beyond science” to answer questions such as: “Who are we?” “Where did we come from?” These questions are philosophical or religious.

The Rules of Science

It used to be that: “*Science was the search for truth.*” Today, we have a different worldview which says: “*Science is the search for anything naturalistic.*” Notice how this limits our understanding in light of our origins. Only one worldview is allowed: “Naturalism.”

But, what about the worldview that says, God is our Creator (not nature). If true, where does that leave NASA’s Origin’s Program? Why not consider the possibility that life is a product of creative intelligence? Science would not come to an end. What would come to an end is the secular religion of Naturalism.

Ancient mankind can be forgiven for attaching cosmic meaning to natural objects. However, even in the modern age of science a fair percentage of people still attach cosmic power and import to comets, to planets, to stars. In either case, each is not a testable hypothesis for our origins, but an article of faith.

Club Meeting & Star Party Dates

Date	Subject	Location
Apr. 08, 7:30 PM	The monthly Club Meeting. In lieu of a special guest speaker and if the weather is clear, we will head over to the observatory for some viewing. If the weather is cloudy, and we have time, Joan will lead an audience participating activity about the type of stars that scientists look for that may harbor planets.	Masonic Hall West Kennebunk, Me.
Apr. 21, 8:00 PM	Open Observing Session with rain/cloud date of Mar. 25th. New Moon 3/29.	Starfield Observatory, West Kennebunk, Me.
May 05, 7:30 PM	The monthly Club Meeting. Topic TBD.	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.

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.



Planets in Strange Places

By Trudy E. Bell

Red star, blue star, big star, small star—planets may form around virtually any type or size of star throughout the universe, not just around mid-sized middle-aged yellow stars like the Sun. That's the surprising implication of two recent discoveries from the 0.85-meter-diameter Spitzer Space Telescope, which is exploring the universe from orbit at infrared (heat) wavelengths blocked by the Earth's atmosphere.

At one extreme are two blazing, blue "hypergiant" stars 180,000 light-years away in the Large Magellanic Cloud, one of the two companion galaxies to our Milky Way. The stars, called R 66 and R 126, are respectively 30 and 70 times the mass of the Sun, "about as massive as stars can get," said Joel Kastner, professor of imaging science at the Rochester Institute of Technology in New York. R 126 is so luminous that if it were placed 10 parsecs (32.6 light-years) away—a distance at which the Sun would be one of the dimmest stars visible in the sky—the hypergiant would be as bright as the full moon, "definitely a daytime object," Kastner remarked.

Such hot stars have fierce solar winds, so Kastner and his team are mystified why any dust in the neighborhood hasn't long since been blown away. But there it is: an unmistakable spectral signature that both hypergiants are surrounded by mammoth disks of what might be planet-forming dust and even sand.

At the other extreme is a tiny brown dwarf star called Cha 110913-773444, relatively nearby (500 light-years) in the Milky Way. One of the smallest brown dwarfs known, it has less than 1 percent the mass of the Sun. It's not even massive enough to kindle thermonuclear reactions for fusing hydrogen into helium. Yet this miniature "failed star," as brown dwarfs are often called, is also surrounded by a flat disk of dust that may eventually clump into planets. (Note: This brown dwarf discovery was made by a group led by Kevin Luhman of Pennsylvania State University.)

Although actual planets have not been detected (in part because of the stars' great distances), the spectra of the hypergiants show that their dust is composed of forsterite, olivine, aromatic hydrocarbons, and other geological substances found on Earth.

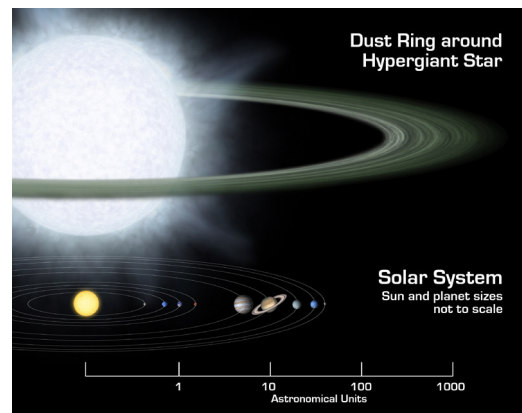
These newfound disks represent "extremes of the environments in which planets might form," Kastner said. "Not what you'd expect if you think our solar system is the rule."

Hypergiants and dwarfs? The Milky Way could be crowded with worlds circling every kind of star imaginable—very strange, indeed.

Keep up with the latest findings from the Spitzer at www.spitzer.caltech.edu/.

For kids, the Infrared Photo Album at The Space Place (spaceplace.nasa.gov/en/kids/sirtf1/sirtf_action.shtml) introduces the electromagnetic spectrum and compares the appearance of common scenes in visible versus infrared light.

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



Caption:

Artist's rendering compares size of a hypothetical hypergiant star and its surrounding dusty disk to that of our solar system.

**Rivers Camera Shop
presents
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Specials • Manuf. Reps. In Store
See website or call for details

GUEST SPEAKERS:

- **AL NAGLER** (*Topic to be announced*)
Founder of Televue Optic. Known for his work with NASA during the Apollo lunar missions and as optic design innovator.
- George Clark, George is currently perusing a physics major at the University of New Hampshire. He is a leading member of the UNH Observatory team and is present at many public viewing events. George is also author of many Rivers camera and Telescope's "Eye on The Sky" newsletters. George's future plans are to become a theoretical physicist in the field of cosmology.
- Ed McDonough "Every one can now be an astronomer" Ed will be introducing the Celestron's new award-winning SkyScout portable sky navigator. (Ed will discuss its use and benefits to Astronomers from novice to expert.) He will also discuss other Celestron products and innovations as well as Celestron accessories. The SkyScout was the buzz at this year's CES Show and featured on *CNN* and *USA Today*, and won the prestigious Popular Mechanics Award.
- John Gianforte (*Topic to be announced*) Explore the scientific contribution that can be made by the modern amateur astronomer. By day, John is the Director of Installations for Goss International. By night, he is a serious amateur astronomer. John writes a monthly column for the *Posters Daily Democrat* "Scanning the Heavens", has taught astronomy at various institutions, contributed to both public radio and public television, and conducts public observing at the UNH Observatory.
- Mike Fowler, Meade's regional sales manager, has been an amateur astronomer for 25 years and in the telescope industry for 16 years. Mike specializes in large aperture telescopes including Meade's new RCX400. Mike will give a lecture on Meade's newest line-up of 13 telescopes including the ED80 and ED127 and next generation DSL imagers.

Schedule

10:00-11:00 George Clark
11:15-12:15 Ed McDonough
Break
1:00-2:00 John Gianforte
2:15-3:15 Al Nagler
3:30-4:15 Meade Rep

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★ There is no charge for attending Astroday activities. However, we do request that you email at sales@riverscamera.com or call us if you plan to attend as so we can plan seating in the lecture room. (Visit our website for details www.riverscamera.com)

**See the NEW! Celestron SkyScout
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**DOOR PRIZES
TO BE ANNOUNCED**

Hours:
M-W 8:30-6
Th. 8:30-7
Fri. 8:30-6
Sat. 9:30-5

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 _____

