

# SKYLIGHTS

Newsletter of the Astronomical Society of Northern New England



May 2008



Member of NASA's  
Night Sky Network



Astronomical League  
Member

## ASNNE MISSION

ASNNE is an incorporated, non-profit, scientific and educational organization with three primary goals:

- 1) To have fun sharing our knowledge and interest with others.
- 2) To provide basic education in astronomy and related sciences to all who are interested.
- 3) To promote the science of Astronomy.

## What's Up In May

By Bernie Reim

Our landscape is once again being transformed by spring and the tender new leaves will be appearing soon. There are several exciting celestial highlights this month for us to enjoy along with the warmer weather.

There will be a meteor shower, the best evening apparition of Mercury for the year, and Mars will cross right through the Beehive Star Cluster.

The Eta Aquarid meteor shower will start on May 5th and peak on Tuesday morning, May 6. There will be no moon to interfere with this shower, so we could expect about 10 meteors per hour from a dark site away from any lights. The southern hemisphere will see up to 60 per hour that morning because the constellation of Aquarius is higher in the sky.

Caused by Halley's Comet, the Eta Aquarids are just bits of comet dust burning up as they streak into our upper atmosphere at 40 miles per second. This most famous of all comets also causes the October 21 Orionids, when the earth passes through the other part of Halley's permanent debris trail in space.

Since the constellation of Aquarius, located between Capricorn and Pisces, never gets very high in our sky, we have a good chance of seeing some spectacular Earth-grazing meteors starting around 2 am on the 6th just as Aquarius will be rising in the east. So dress warmly and enjoy the show, perhaps being serenaded by spring peepers as the earth once again slowly reawakens to spring.

Mercury never gets very high in the sky because it is located so close to the sun. However, the first planet will make it best evening apparition for the year during the first part of this month, reaching its highest point on May 12. Look for Mercury just below the Pleiades 45 minutes after sunset on May 1. Then Mercury will rise above this famous star cluster and a slender waxing crescent moon will join the pair on May 6.

The planet Mercury still holds on to many mysteries. We are in the process of solving

some of these with the Messenger spacecraft, launched back on August 3 of 2004. This spacecraft made its first approach of Mercury in January of this year and it will make two more close approaches over the next 3 years, finally going into orbit around Mercury in 2011 after a journey of nearly 5 billion miles and 7 years. Mercury has one of the largest craters in the solar system at 1000 miles across. The whole planet is only 3000 miles in diameter, about one third the size of Earth. Mercury is the only other terrestrial planet with a strong magnetic field and it has an iron-dominated core that takes up 75% of its radius and half its volume.

Mars continues to fade out as the earth leaves it farther behind in our orbits around the sun. However, the red planet will pass right in front of several of the stars in the Beehive star cluster in Cancer on May 22 and 23. Mars is moving eastward towards Saturn quite rapidly, at the rate of just over half a degree per day. That translates to 1.4 arc minutes per hour and 1.4 arc seconds per minute. Mars moves its own diameter eastward in just 3 and a half minutes. Through a telescope you will actually be able to see this continual motion in

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### What's Up "Continued from page 1"

relation to the bright stars in the Beehive. When the moon occulted the Pleiades on April 8th, I could easily see its continual motion of half a degree eastward every hour through a pair of binoculars. Mars moves 24 times slower than the moon, but you should still be able to notice its motion through a telescope.

The Beehive star cluster, also known as Praesepe, or the manger in Latin, and object M44 in Messier's catalogue, is located about 600 light years away, or 200 light years farther than the Pleiades. So the light you will see from the Beehive as nearby Mars passes in front of these distant stars left the Beehive just as the Renaissance was starting in 1400 in France and Italy.

There are at least 200 stars in the Beehive cluster and they are about 700 million years old, which is still 7 times younger than our sun and Earth. The stars in the Beehive were born in the same diffuse nebula in which the stars in the Hyades cluster originated, that distinctive V-shaped cluster nearby marking the face of Taurus the bull.

Saturn will be at its closest to Regulus, the brightest star in Leo, on May 3. The ringed planet will be just over 2 degrees east of the star. Then Saturn resumes its direct, eastward motion and its distance from Regulus will slowly increase again. Notice the contrast of the slightly brighter, soft golden light of Saturn next to the white light of Regulus, the 21st brightest star in the sky.

Jupiter will start rising before midnight by the end of May. It will reach opposition on July 9, the same day that Mars and Saturn will be less than one degree apart in the evening sky.

May 1-3. Mercury passes less than 3 degrees below the Pleiades.

May 5. New moon is at 8:18 a.m. EDT.

May 6. The Eta Aquarid meteor shower peaks this morning.

May 9. Jupiter ends its direct motion and begins its retrograde or westward motion back towards the teapot in Sagittarius today.

May 10. This is National Astronomy Day. The moon will skim the southern edge of the Beehive tonight.

May 11. First quarter moon is at 11:47 p.m.

May 12. Saturn and Regulus are just a few degrees north of the moon tonight. Mercury reaches its highest point in the evening sky.

May 14. Skylab, our first space station, was launched on this day in 1973.

May 19. Full moon is at 10:11 p.m. This is also known as the Corn, Planting, Milk, or Flower Moon. The first flower appeared on Earth fairly recently, about 100 million years ago. They are not only beautiful and ethereal, but they are essential to human life, since almost all of our food including wheat, corn, and rice along with many medicines, ancient and modern, are derived from flowers.

May 22-23. Mars passes through the upper middle part of the Beehive star cluster.

May 24. The waning gibbous moon is just below Jupiter tonight.

May 25. On this day in 1961, JFK challenged our nation to put a man on the moon before 1970. We accomplished that on July 20, 1969.

May 27. Last quarter moon is at 10:57 pm.

May 29. On this day in 1919 Einstein's General Theory of Relativity passed its first major test during a total solar eclipse in Africa and South America as starlight was refracted by the gravity of our

Dear Editors:

I am attaching our first issue of a bi-monthly news- letter all about the many useful and--it goes without saying--free resources on The Space Place website. You will also find a few copies of it included with your May Space Place partner mailing.

The newsletter targets classroom and home school teachers, after-school program directors, museum and library program directors, and other informal educators. We know many of your members work with teachers and students in your community, so that's why we are including you.

We would like to encourage you to print it and copy it freely for your members to share with teachers and others who work with children. Also, if you would like to include a link to it in your newsletter, it may be downloaded from <http://spaceplace.nasa.gov/en/educators>.

We hope you and your members find the newsletter and [spaceplace.nasa.gov](http://spaceplace.nasa.gov) helpful.

Best wishes,

*Colleen Barboza (Space Place Coordinator)*

Moon Phases

**May 5**  
New

**May 11**  
First Quarter

**May 19**  
Full

**May 27**  
Last Quarter

Moon Data

**May 1**  
Uranus 3° south  
of Moon

**May 5**  
Moon at perigee

**May 6**  
Mercury 3° south  
of Moon

**May 10**  
Mars 0.2° north  
of Moon

**May 12**  
Saturn 3° north  
of Moon

**May 20**  
Moon at apogee

**Antares 0.2° north  
of Moon**

**May 24**  
Jupiter 2° north  
of Moon

**May 26**  
Neptune 0.6° south  
of Moon

**THE DAILY ASTRONOMER**

**April 7, 2008**

**Three Times the Twilight**

From the USM Southworth Planetarium  
"Just Heavenly"

**Submitted by Joyce Brann**  
**Permission by Edward Gleason USM**

*Even twilight is a complicated matter! Astronomy has more than its fair share of unnecessarily complex phenomena. That is hardly a surprise considering we live in the Byzantine catastrophe of an untidy Universe. (If you love complications: i.e., a pleasant afternoon for you involves solving calculus problems in Mandarin while trying to balance eggs on a dingy in the open sea, then astronomy is your temptress.. or tempter.)*

*The typical view of twilight is not the same as the astronomical definition. We tend to think of twilight as the period just after sunset and just before sunrise when the sky hemorrhages lovely hues of reds, violets and tangerines. These are particularly beguiling sights when a crescent moon or bright planet makes an appearance. The atmosphere causes these twilights because the gases refract the Sun's light, causing it to illuminate our part of the world despite the absence of the Sun in the sky.*

*Ask an astronomer about twilight and he'll tell you that there is more than one. There are, in fact, three of the accursed things.*

*Civil Twilight is the twilight that we think of as "twilight." This is the period immediately after a sunset or immediately before a sunrise. During this twilight period, one can still see rather clearly. The sky is alight with enough soft hues to sustain a dozen art colleges and every Portlander not in police custody is jogging around Back Cove. Civil twilight occurs when the Sun is within six degrees of the horizon. The Sun is still close enough to cast a great deal of light toward our up-*

*per atmosphere and this light scatters throughout the sky and down to us.*

*Nautical Twilight is the time period when the bright planets and stars become visible in an increasingly darkening sky. During nautical twilight, the horizon is still discernible. Celestial navigators used this time to determine the angles separating the brightest stars and planets from the horizon. These measurements enabled the navigators to ascertain their position on the globe. Making such determinations isn't possible when the horizon isn't visible and thus this twilight epoch was essential for the navigator, hence the term "nautical twilight." Nautical twilight occurs when the Sun is between 6 - 12 degrees of the horizon.*

*Astronomical Twilight occurs when the Sun is between 12 - 18 degrees of the horizon. After the Sun is more than 18 degrees away from the horizon any light scattering is negligible and the night is as dark as it is going to be. During this phase, the dimmer stars and planets become visible as the horizon line dissolves in the encroaching darkness.*

*The duration of each phase varies with latitude and season. It is longer in the Summer than Winter. Between the equator and just south of the Arctic Circle, the longest civil twilight is around the Summer Solstice (about 37 minutes for us); the shortest civil twilight is a more complex matter. The civil twilight duration has two minima in March and September (about 28 minutes for us), around the times of the equinoxes.*

*If you loathe complexity, here is a simple rule of thumb one can employ: each phase lasts about half an hour.*

*So, if the sun sets at 7:11 p.m., one will start to see the bright stars at 7:41 and the sky will become deliciously dark by 8:30 or so. When one knows the sunset, one can schedule their stargazing for an hour later and can continue to admire the stars until about an hour before sunrise.*

**Principal  
Meteor  
Showers in  
2008**

**January 4**  
Quadrantids

**April 22**  
Lyrids

**May 6**  
Eta Aquarids

**July 30**  
Delta Aquarids

**August 12**  
Perseids

**October 9**  
Draconid

**October 21**  
Orionids

**November 9**  
Taurids

**November 18**  
Leonids

**November 26**  
Andromedids

**December 14**  
Geminids

**December 22**  
Ursids

*Note: Dates are  
for maximum*

Got any News?   
Skylights welcomes your Input.

*Here are some suggestions:*

*Book reviews -- Items for sale -- New equipment -- Ramblings --  
Star parties -- Observing -- Photos.*

## Club Items For Sale



Our club has merchandise for sale at:  
[www.cafepress.com/asne](http://www.cafepress.com/asne)

*All money raised goes to our operating fund.*

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

### SHOP CATEGORIES

Postage • Apparel • Housewares  
Hats & Bags • Stickers, Buttons & Magnets



DGM Optics OA-4 Off-Axis Newtonian Dob [unobstructed light path], with Telrad, on a 23" RTP [Round Table Platforms] Equatorial Platform. Also available is a nice matching wooden eyepiece box with 3 brand new University Optics HD Ortho eyepieces [6mm, 12mm 18mm]. Would prefer to sell as a package but will split it up. I've made some upgrades to this scope, it is an exceptional package that gives views that rival a quality APO refractor. Call Tim Brown for more details: 207-337-3318

- Scope w/Telrad: \$550
- RTP EQ Platform: \$495
- EP Box w/3 eyepieces: \$225
- Scope w/Platform: \$995
- All of the above: \$1195



\*\*\*\*\*  
 ★ March 21, 2008  
 ★ EMAIL INFO from Claudia Updike, Adria's mother:  
 ★ Submitted by Pat Achiele  
 ★  
 ★ Good Morning!  
 ★ I thought I would send this NASA link to all of you for a better glimpse of what Adria's gamma ray  
 ★ burst (GRB) research is all about! Adria flew to Munich on Wednesday for a 4-week stay at the Max  
 ★ Planck Institute. If all goes well here, she will travel to Chile in June to work with astronomers at the  
 ★ Very Large Telescope (on a very big mountain!)! Meanwhile, back in Maine, we are having MORE  
 ★ SNOW!!!! The poor birds all wish they had stayed South!!! We are looking forward very eagerly to  
 ★ our April trip to Charleston! Take care.....  
 ★  
 ★ ----- Original Message -----  
 ★ From: NASA Science News  
 ★ To: NASA Science News  
 ★ Sent: Friday, March 21, 2008 7:11 PM  
 ★ Subject: Naked-eye Gamma Ray Burst  
 ★  
 ★ NASA Science News for March 21, 2008  
 ★  
 ★ Two nights ago, astronomers observed a cosmic explosion so intense it was visible to the naked eye  
 ★ from a distance of 7.5 billion light years.  
 ★  
 ★ FULL STORY at [http://science.nasa.gov/headlines/y2008/21mar\\_nakedeye.htm?list1001497](http://science.nasa.gov/headlines/y2008/21mar_nakedeye.htm?list1001497)  
 ★ Check out our RSS feed at [http://science.nasa.gov/rss.xml!](http://science.nasa.gov/rss.xml)  
 ★  
 ★\*\*\*\*\*

Editor's Note: Adria Updike used to be one of our club members. I'm sure I can speak for all who knew her: "We are proud of you Adria." Good luck.



## Stellar Compass for Space Explorers

by Patrick Barry

In space, there's no up or down, north or south, east or west. So how can robotic spacecraft know which way they're facing when they fire their thrusters, or when they try to beam scientific data back to Earth?

Without the familiar compass points of Earth's magnetic poles, spacecraft use stars and gyros to know their orientation. Thanks to a recently completed test flight, future spacecraft will be able to do so using only an ultra-low-power camera and three silicon wafers as small as your pinky fingernail.

"The wafers are actually very tiny gyros," explains Artur Chmielewski, project manager at JPL for Space Technology 6 (ST6), a part of NASA's New Millennium Program.

Traditional gyros use spinning wheels to detect changes in pitch, yaw, and roll—the three axes of rotation. For ST6's Inertial Stellar Compass, the three gyros instead consist of silicon wafers that resemble microchips. Rotating the wafers distorts microscopic structures on the surfaces of these wafers in a way that generates electric signals. The compass uses these signals—along with images of star positions taken by the camera—to measure rotation.

Because the Inertial Stellar Compass (ISC) is based on this new, radically different technology, NASA needed to flight-test it before using it in important missions. That test flight reached completion in December 2007 after about a year in orbit aboard the Air Force's TacSat-2 satellite.

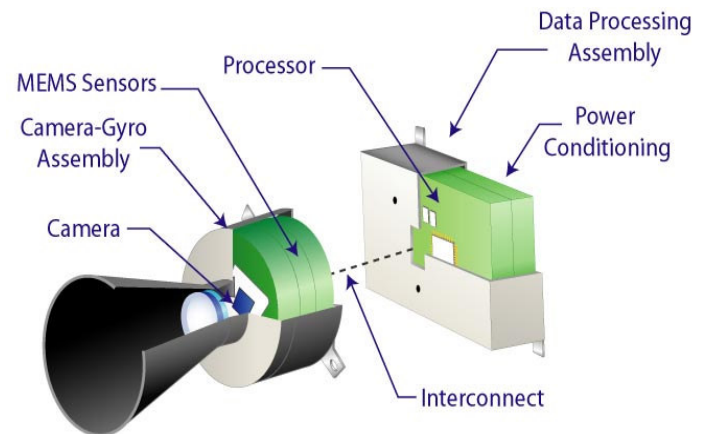
It just performed beautifully," Chmielewski says. "The data checked out really well." The engineers had hoped that ISC would measure the spacecraft's rotation with an accuracy of 0.1 degrees. In the flight tests, ISC surpassed this goal, measuring rotation to within about 0.05 degrees.

That success paves the way for using ISC to reduce the cost of future science missions. When launching probes into space, weight equals money. "If you're paying a million dollars per kilogram to send your spacecraft to Mars, you care a lot about weight," Chmielewski says. At less than 3 kilograms, ISC weighs about one-fifth as much as traditional stellar compasses. It also uses about one-tenth as much power, so a spacecraft would be able to use smaller, lighter solar panels.

Engineers at Draper Laboratory, the Cambridge, Massachusetts, company that built the ISC, are already at work on a next-generation design that will improve the compass's accuracy ten-fold, Chmielewski says. So ISC and its successors could soon help costs—and spacecraft—stay on target.

Find out more about the ISC at [nmp.nasa.gov/st6](http://nmp.nasa.gov/st6). Kids can do a fun project and get an introduction to navigating by the stars at [spaceplace.nasa.gov/en/kids/st6starfinder/st6starfinder.shtml](http://spaceplace.nasa.gov/en/kids/st6starfinder/st6starfinder.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:**

*Compass is built as two separate assemblies, the camera-gyro assembly and the data processor assembly, connected by a wiring harness. The technology uses an active pixel sensor in a wide-field-of-view miniature star camera and micro-electromechanical system (MEMS) gyros. Together, they provide extremely accurate information for navigation and control.*

## Club Meeting & Star Party Dates

Date	Subject	Location
May, 2	5:00PM to 6:20 PM Business Meeting. 6:30PM to 7:15PM Beginner Classes. 7:30PM Club Meeting Begins: Topic: <b>TBD</b> PLEASE NOTE: Unfortunately our scheduled Guest Speaker, <b>Steve Ingraham</b> , has unexpected travel plans and cannot be with us in May. He will likely reschedule for July or August. (Possible observing after the meeting).	Masonic Hall West Kennebunk, Me.
May 10, Dusk (Astronomy Day)	Open Observing Session (Saturday Only) York Middle School is planning to attend.	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>



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

**2008 Membership Registration Form**

(Print, fill out and mail to address above)

Name(s for family): \_\_\_\_\_

Address: \_\_\_\_\_

City/State: \_\_\_\_\_ Zip code: \_\_\_\_\_

Telephone # \_\_\_\_\_

E-mail: \_\_\_\_\_

Membership (check one):

Individual \$35 \_\_\_\_\_ Family \$ 40 \_\_\_\_\_ Student under 21 years of age \$10 \_\_\_\_\_ Donation \_\_\_\_\_

Sky & Telescope (\$32.95) \_\_\_\_\_ Astronomy (\$34) \_\_\_\_\_

Total Enclosed \_\_\_\_\_

Tell us about yourself:

1. Experience level: Beginner \_\_\_\_\_ Some Experience \_\_\_\_\_ Advanced \_\_\_\_\_

2. Do you own any equipment? (Y/N) And if so, what types?  
 \_\_\_\_\_

3. Do you have any special interests in Astronomy?  
 \_\_\_\_\_

4. What do you hope to gain by joining ASNNE?  
 \_\_\_\_\_

5. How could ASNNE best help you pursue your interest in Astronomy?  
 \_\_\_\_\_

6. ASNNE's principal mission is public education. We hold many star parties for schools and the general public for which we need volunteers for a variety of tasks, from operating telescopes to registering guests to parking cars. Would you be interested in helping?

Yes \_\_\_\_\_ No \_\_\_\_\_

7. ASNNE maintains a members-only section of its web site for names, addresses and interests of members as a way for members to contact each other. Your information will not be used for any other purpose. Can we add your information to that portion of our web site?

Yes \_\_\_\_\_ No \_\_\_\_\_

