



Back Bay Observer



The Official Newsletter of the Back Bay Amateur Astronomers

March 2006 Issue
 Edited by Barb Weiner

Please submit any articles for the
 Back Bay Observer
 to

Barb Weiner at
barb.weiner@cox.net

no later than

the **24th**
 of the month.

Please type
 "Newsletter Article"

in the subject line AND a short title of the
 article.

The newsletter is now available
 Online at:

[http://members.cox.net/bbaanewsletter/
 newsletter.shtml](http://members.cox.net/bbaanewsletter/newsletter.shtml)

Back Bay Amateur Astronomers

P.O. Box 9877

Virginia Beach, VA 23450-9877



Looking Up

March Comes in Like a Lion

That's what they say, "March comes in like a lion and goes out like a lamb." Of course "they" are referring to the weather, with the cold March winds at the outset of the month, and the milder spring breezes at the end. But there is an astronomical meaning as well.

Astronomers can look to the eastern horizon after sunset in March and see Leo the Lion rising. By midnight Leo is high in the sky, stalking Saturn and being followed in the ecliptic plane by brilliant Jupiter. By the end of March Leo is being followed across the sky by Boötes the herdsman and (theoretically) his sheep.

As springtime approaches in March, so also does that time of year when all 110 (or 109) Messier objects are potentially visible in a single night, and the "Messier Marathon" can be done. During the period close to the Spring equinox and on into spring and very early summer the Virgo cluster (or "clutter") of galaxies may be observed.

As the weather warms up, maybe we can get out more (before the mosquitoes start waking up) and get out under that glorious night sky. If you have had your scope in storage during the winter, it's time to clean it up, dust it off, get the spiderwebs off your Dob's spider, and KEEP LOOKING UP.

George

In This Issue:

Looking Up	1
February Meeting Minutes	2
What's Up? March, 2006	2
Searching for the 'Man in the Moon'	2
Introduction to Astrolmaging – February's BBAA Meeting Feature	3
Seneca Rock Star Party	3
Space Place	4
Planetarium Info	4
Report on my new Megrez 80IIED Triplet By Dale Carey	5
Basic Advice for Newbie Astronomers	5
Calendar	6

Glenn Butler

Robert Nottingham

Welcome New Members

Earl Godwin

Terry Jackson

It is with mixed emotions that I am announcing my departure as the Observer Editor.

I have been doing this for quite a while now, and it is time to give someone else a chance to be involved. I have enjoyed publishing it, and I think someone else will enjoy it too. I am always pleased that so many people enjoy the Observer each month. I will be happy to assist the new editor with anything he or she requires, but this will be my last edition.

Please continue to feel free to contact me, for any questions, or assistance. I will continue as your treasurer, and active as a club member, and continue with the other committees to which I am committed.

Thanks to all of you for your support, kind words, and praise. I know your next editor will appreciate your support as well. Thanks for a great run!

I love you all, Peace, and Dark Skies!!! Barb

February Meeting Minutes

February 2nd, 2006

The February meeting of the Back Bay Amateur Astronomers was called to order by -President George Reynolds on Thursday February 2nd, 2006 at the Virginia Beach TCC campus.

It was standing room only with thirty seven members present including Bruce Bodner, George Reynolds, Barbara Weiner, Kevin Weiner, Chuck Jagow Rick Bish, Robert Harris, Dale Carey, Bill Powers, Benito Loyola, Jeff Heileger, Stan Hubbard, Mike Pereira, Brian Murphy, Neil Alford, Bill Setzer, Randy Paschal, Kevin Swann, Earl Godwin, Glenn Butler, Karen Murphy, Matt McLaughlin, Jay Garrard, Tom Pearson, Larry Wade, Gerry Carver, Ted Forte, Ronnie Eubanks, Georgie June, Kenny Broun, Homer Rushing, Terry Jackson, Chuck Rippel, Tom Palatini, Tashonia Blackwell, Michelle Shin & Greg Notting-ham.

The secretary, Chuck Jagow, reported that we had about 116 members and seventeen were in need of paying their dues, most of which were due in December.

Our ALCOR, Georgie June, provided the Alcor's report which stated that Gerry Carver had turned in his Double Star logs, Ted Forte had finished the requirements for the Globular Cluster list and Dale Carey had earned the Honorary Messier Binocular award.

The treasurer, Barb Weiner, reported that we have \$4,925.86 total, \$856.73 in the scholarship fund and \$4,069.13 for club operations.

George Reynolds initiated a "new members" introduction, where each person in attendance introduced themselves and said a little about themselves and their astronomy endeavors.

Old business included quite a bit of talk about Garden Stars, what they want and expect from the club.

New business consisted of talk about Chip-pokes Plantation and Cornland Park in Chesapeake. Chuck Jagow said he would try and contact the city of Chesapeake about loosening up the requirements to use Cornland more freely. Also discussed were the upcoming Astronomy Day in May, and what libraries had requested our presence.

The main speaker this evening was Stephen Hamilton who gave a presentation on the basics of Astronomical Imaging with a CCD camera. The presentation was very informative and entertaining.

During the Observer's Corner we commiserated about the clouds in general and how great the Nightwatch ended up being despite a dismal start.

George then went over the upcoming February schedule.

Tom Pearson graciously provided the refreshments. Many thanks to him!

The meeting was adjourned a bit after 9:22 PM.

Welcome Home Rick, Mary and their new addition Katherine Bish

What's Up? March, 2006

Who has seen the lovely conjunction of the planet Saturn and the Beehive Cluster (M44)? If you haven't seen it yet, it will be there for a few more weeks, so take a peek if you have some clear skies.

Saturn is in Cancer the Crab, a rather dim and sparse constellation. Cancer has two well-known open clusters, M44 (The Beehive) and smaller and more distant M67. Look up in the southeast and locate Orion, then look over his right shoulder and find Gemini. Using the bright stars Castor and Pollux, the "heads" of the Gemini twins as

pointer stars, Saturn will be to their south-east, or "lower left".

Under low power or with a rich field scope, Saturn will look like a small, ringed disc with the myriad of starry "bees" buzzing to one side. If the air is still, you can use high power to see Saturn's rings and cloud bands, and the shadow of the planet on its rings. At least two, and perhaps as many as five or six of Saturn's moons may be visible.

What else of interest have group members been observing lately? Come to the meeting on Thursday, March 2 and tell us about it.

Our own Stephen Hamilton gave a feature presentation and slide show at the February 2 BBAA meeting. He showed us an introduction to astroimaging, the taking of those pretty pictures of planets and deep-sky objects.

It was an impressive show, and I can see there is a lot of hard work (not to mention expense) involved in astrophotography. I am happy to

let Steve and the others who enjoy it take the pictures, and I will continue to enjoy looking at them. :-)
George

Searching for the 'Man in the Moon'

<http://www.cnn.com/2006/TECH/space/02/10/man.moon/index.html>

(SPACE.com) -- The "Man in the Moon" illusion, familiar to various cultures around the world, was created by powerful asteroid impacts that rocked the satellite billions of years ago, a new study suggests.

The study, performed by Laramie Potts and Ralph von Frese of Ohio State University, reveals that ancient lunar impacts played a much larger role in shaping the moon's surface than scientists had

previously thought. It may also help explain the origins of two mysterious bulges on the moon's surface.

The new analysis reveal that shock waves from some of the moon's early asteroid impacts traveled through the lunar interior, triggering volcanic eruptions on the moon's

opposite side. Molten magma spewed out from the deep interior and flooded the lunar landscape.

When the magma cooled, it created dark patches on the moon called "lunar maria" or "lunar seas."

The man's eyes are the Mare Imbrium and Mare Serenitatis, its nose is the Sinus Aestuum and its grinning mouth is the Mare Nubium and Mare Cognitum.

The effects of some of those traveling shock waves are still visible in the moon's interior today. Cross-sectional images of the insides reveal that a part of the



mantle, the section between the moon's core and crust, still juts into its core today, 700 miles below the point of one of the impacts.

The images were created from data collected by NASA's Clementine and Lunar Prospector satellites.

Early surveys by the Apollo missions revealed that the moon isn't a perfect sphere. There is a bulge on the Earth-facing side, called the near side, and another bulge on the far side.

According to one hypothesis, these bulges are the result of Earth's gravity tugging on the moon during the early years following its cataclysmic formation, when its surface was still molten and malleable.

The current study suggests that this scenario is only partly correct. The researchers

(Continued on page 3)

Introduction to Astrolmaging – February's BBAA Meeting Feature

The February BBAA meeting was excellent! Steve Hamilton's presentation of an introduction to Astrolmaging was fascinating. Not only was it educational, it was entertaining. Steve should write a book on "Astrolmaging for Dummies". Even I learned some terms and got an even greater appreciation for all the work that goes into taking those pretty pictures of the stars and planets.

The meeting room was Standing Room Only, and a number of first-timers were present, new members and visitors. Although the meeting ran a bit longer than usual, no one walked out. (Steve put glue on their chairs!) A lively discussion followed at the end of the meeting, and folks hung around talking for a good while afterward.

Steve talked and showed an animated slide show of the different types of astroimaging, the different types of cameras, and the processes involved in planetary imaging and deep-space imaging. He explained terms and procedures, like "Flat frames" and "Dark frames" and "Registration" and a whole lot more. He then went on to demonstrate how it is done, using one of the many software products he uses to process his pictures.

A lot of questions were asked and answered, both during and after the presentation. Dr. Bruce Bodner, Chuck Jagow, Larry Wade, and Chuck Rippel added some insightful comments from their experiences as well.

If you missed Steve's presentation, and are interested in astrophotography or imaging, let him know. The references Chuck Rippel posted on Backbayastro are outstanding. They are a few among many

available, but are among the best, I am told. (Being a strictly visual astronomer, I'm not the best one to rate them, but I have heard they are good.) Here they are:

Ron Wodasky - The New CCD Astronomy
<http://www.newastro.com/newastro/default.asp>

Online Tutorials from Waid Observatory
<http://www.waid-observatory.com/articles.html>

AIP4Win -
<http://www.willbell.com/aip/index.htm>

Photoshop Astronomy - (To be released 2/06 Special Pre-Publication Price)
http://www.willbell.com/CCD/photoshop_astronomy.htm

(Continued from page 2)

think the moon was struck by at least two very powerful asteroid impacts in its past (in addition to countless smaller impacts that left smaller craters easily identifiable still today).

One of the major impacts struck the near side, sending shock waves that traveled through the lunar interior to create the bulge on the far side; the other impact struck the far side and created the bulge on the side.

The researchers think the impacts happened about four billion years ago. At that time, roughly half a billion years after the birth of the solar system, the moon was still geologically active and its core and mantle were still molten and malleable.

Back then, the moon was much closer to the Earth than it is today and the gravitational

interactions between the two were much stronger. The researchers think that when magma spilled out of the moon's interior, Earth's gravity immediately grabbed hold and hasn't let go since.

"This research shows that even after the collisions happened, the Earth had a profound effect on the moon," Potts said.

The findings were detailed in a recent issue of the journal *Physics of the Earth and Planetary Interiors*.

Other images may seen in the Moon, like the Rabbit in the Moon, the cow jumping over the Moon, and the Woman in the Moon. If you elect to pursue the Lunar Observer's Club certificate and pin from the Astronomical League, you will see such illustrations.



SENECA ROCK STAR PARTY

Welcome to the 3rd no frills SRSP

To be held **May 24th thru the 31st, 2006 at the Seneca Shadows Campground W. Va.**
<http://www.seneca-rocks.com/seneca.shadows.html>.

Cost is a small \$5.00 per night per person, under 13 free. Includes campsite, parking, restrooms and showers. I have reserved area "E". This site has 5 "pads"; each pad will hold 2 or 3, 8'x10' tents. Also there are 6 picnic tables and a grill, with rest rooms and showers with in 100' from the site. Each parking area will accommodate about 10 cars (other parking close) and up to 40 people. Registration each day is after 2pm or when ever

you get there. See Dale Carey at the site to register.

The mountains take away 15/20* on the horizons but when night falls, WOW.

The sky is the best I have seen anywhere on the east coast, including Chiefland. It takes 5 hrs from Va.Beach. On a map just take 64W past Charlottesville, go N on 81 to Harrisonburg, then take 33W to Seneca.

During the day you can turn your scopes to scenic views of Seneca Rocks, giant 1000' rocks stick out of the mountains in the distance and are a climber's paradise.

Also visit the **National Radio Astronomy Observatory in Green Bank** or take a ride

up to the top of **Spruce Knob**, both less than an hour away, and for a really good time, climb to the top of **Seneca Rock**. You will not be disappointed at this park.

Sunday we will have a bring your own cook out.

If you would like to join in, sign up on the BBAA Yahoo site and click on "database" or send me an e-mail at vbstar-gazer@verizon.net or call 431 8556 or, you can just show up.

SEE YOU THERE

PS - Space limited, first come first served/ Only have room for 10 tents on this site and 3 small campers in parking lot -there are plenty of nice shady campsites in the park though with elec/water if you prefer a more private site, call ahead to reserve.



Micro-sats with Macro-potential

By Patrick L. Barry

Future space telescopes might not consist of a single satellite such as Hubble, but a constellation of dozens or even hundreds of small satellites, or “micro-sats,” operating in unison.

Such a swarm of little satellites could act as one enormous telescope with a mirror as large as the entire constellation, just as arrays of Earth-bound radio telescopes do. It could also last for a long time, because damage to one micro-sat wouldn't ruin the whole space telescope; the rest of the swarm could continue as if nothing had happened.

And that's just one example of the cool things that micro-sats could do. Plus, micro-sats are simply smaller and lighter than normal satellites, so they're much cheaper to launch into space.

In February, NASA plans to launch its first experimental micro-sat mission, called Space Technology 5. As part of the New Millennium Program, ST5 will test out the crucial technologies needed for micro-sats—such as miniature thrust and guidance systems—so that future missions can use those technologies dependably.

Measuring only 53 centimeters (20 inches) across and weighing a mere 25 kilograms (55 pounds), each of the three micro-sats for ST5 resembles a small television in size and weight. Normal satellites can be as large and heavy as a school bus.

“ST5 will also gather scientific data, helping scientists explore Earth's magnetic field and space weather,” says James Slavin, Project Scientist for ST5.

Slavin suggests some other potential uses for micro-sats:

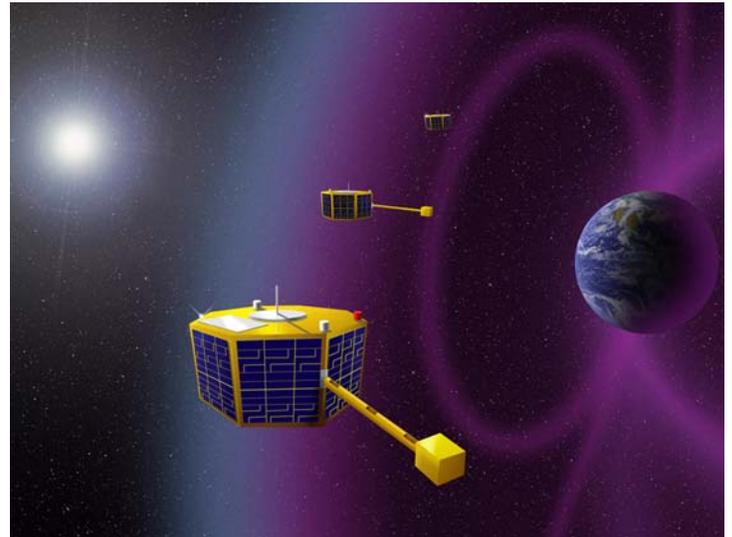
A cluster of micro-sats between the Earth and the Sun—

spread out in space like little sensor buoys floating in the ocean—could sample incoming waves of high-speed particles from an erupting solar flare, thus giving scientists hours of warning of the threat posed to city power grids and communications satellites. Or perhaps a string of micro-sats, flying single file in low-Earth orbit, could take a series of snapshots of violent thunderstorms as each micro-sat in the “train” passes over the storm. This technology would combine the continuous large-scale storm monitoring of geosynchronous weather satellites—which orbit far from the Earth at about 36,000 kilometers' altitude—with the up-close, highly detailed view of satellites only 400 kilometers overhead.

If ST5 is successful, these little satellites could end up playing a big role in future exploration.

The ST5 Web site at nmp.jpl.nasa.gov/st5 has the details. Kids can have fun with ST5 at spaceplace.nasa.gov, by just typing ST5 in the site's Find It field.

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



The Space Technology 5 mission will test crucial micro-satellite technologies.

Planetarium Info:

Chesapeake

"For information call (757) 547-0153

For recorded message (757) 547-STAR

March "Cosmic Symphony" (No program on March 23 & 30)

View the wonders of the night sky while listening to stereo music in the planetarium star theater. Selections of classical and pop music will be played on the planetarium's powerful sound system as visuals dance before your eyes. This program allows your imagination to wander among the stars...

Virginia Beach

For information call (757) 431-4067

The earth has a long and weathered past. Through geologic and astronomical processes during the last 4.5 billion years the face of the earth has constantly changed. This month we look at the forces that shaped our early earth and examine what scientists think caused it to look as it does today. In addition, we'll examine some of the most extreme places on earth and discover some of the oldest land masses on our planet.

Shown March 7, 14, 21, & 28

Sun Earth Day is March 29th

President

George Reynolds

pathfinder027@yahoo.com

(757) 497-0755

Vice President

Kevin Weiner

kevin.weiner@cox.net

(757) 548-4936

Secretary

Chuck Jagow

chuck@jagowds.com

757-547-4226

Treasurer

Barb Weiner

barb.weiner@cox.net

(757) 548-4936

Report on my new Megrez 80IIED Triplet

By Dale Carey

First the description by William Optics

Megrez 80 II ED triplet is an expression of highest quality lens design and superior craftsmanship, from lens assembly down to each detail's material selection.

Aperture	80mm
Focal Ratio	F/7
Focal Length	560mm
Objective Type	Triplet elements design
Resolving Power	1.45"
Limiting Magnitude	11.3
Lens Shade	Retractable
Focuser	2" Rotatable Crayford Focuser
L- type Mount	L- bracket based
1.25" Adapter	Brass Compression Ring Included
Field Stops	7 Baffles with Ultra Flat Black Interior
Tube Diameter	90mm
Tube Length	15.0" (380 mm) Fully Retracted
Tube Weight	5.5 lbs.(2.5 kg)
Soft Carrying Backpack (WxHxD)	15" x 20" x 6.5" (38.1 cmx50.8 cmx16.5 cm)

Its attentive tube execution and optical quality control makes

this the king of short tubes: the perfect quick-view scope that you will hate to part with.

This new Megrez 80mm II ED Triplet with L-based bracket, comes with a backpack-stytle water-resistant carrying case and 2" extender.

Important Notice: the 2" extender is necessary in order to reach focus. I don't need a x1.5 mag to get my binoviewers to focus. All I do is remove the ext. tube from the Megrez and that gives me an extra 2" of intravel. (This scope is made for bino's). Also has a rotatable focus, no longer have to turn the diagonal when the scope turns sideways on an EQ mount, just turn the entire focuser. What I like about ED scopes is that they make the background so dark. Last night even with a bright moon, it was nice and black between stars. The ED's get rid of most the stray light and false color, giving high contrast to any image. Having a Pronto for years was nice, but I really recommend this Williams Optics scope. Smooth focus with no backlash. Much lighter than the 70mm Pronto by TeleVue. (They now make the TV76, and it's lighter).

I have used it on the Vixen Custom D mount and the LXD75 mount, both could hold 5lbs more. It looks very nice on the LXD75 mount, I've already been told," Ah, in two months you'll be taking pictures". What?, astrophotography, not me, no, no, never, I shall hold out till the end. Now, where did I put that DSI I won from Kent, you know, just in case.

**Basic Advice for Newbie Astronomers**

Here are the basics you will need, in addition to what comes with the telescope:

- (1) A planisphere, or "star wheel" to tell you what's up at any given time (same info as one of the magazines, but more handy, and universal).
- (2) A good star chart, or book of them, like the *Cambridge Star Atlas*, *Norton's Star Atlas*, or *Sky Atlas 2000.0*. The latter has more and dimmer stars than the other two, but is bigger and harder to use in the field. You will benefit from a table (or the hood of a car).
- (3) A 2x (nominal) Barlow lens to increase the effective range of your eyepieces. The magnification will be in the range of 2x, more or less, according to the eyepiece it's used with and the depth in the focuser.
- (4) A good book on the basics of amateur astronomy. Terence Dickinson's *Nightwatch* and *The Backyard Astronomer's Guide* are excellent beginning books, as are David Levy's *Skywatching* and *Advanced Skywatching*. Phil Harrington's *Star Watch* is another good book, great for learning the art of star-hopping.

A favorite of mine is Guy Consolmagno's *Turn Left at Orion*. You can find most of these books at a good public library, so you don't have to buy them all, and you can "try before you buy".

The other recommendations I would make, which are not necessarily essential, but will add greatly to your interest and knowledge, are:

(1) Join a local astronomy club. You can learn much from the experienced and helpful old-time astronomers, and you can borrow their eyepieces at a club skywatch (another "try-before-you buy" opportunity).

(2) Subscribe to *Astronomy* and/or *Sky & Telescope* magazine. I place this item SECOND to club membership, because as a member of a local club, you can get a \$10 discount on your subscription to these magazines if you order them through your club's treasurer or secretary.

(3) Get a decent pair of binoculars if you don't have them already. They will help you learn your way around the sky, serve you well for finding objects to look at, and give you wide-angle views of lovely star clusters that are hard or impossible to get in the telescope. I love binoculars. I started out with a cheap pair of 10x50s (\$25 from Wal-Mart), later bought a good pair of Orion UltraView Wide-Angle 8x42s, and most recently a pair of big Barska 15x70 binos, which need a tripod to hold them steady. Do an Internet search on "binoculars" and you will find more information than you ever wanted to know.

Take your time, learn the sky and the techniques for observing, and HAVE FUN! Enjoy yourself in this hobby and learn to appreciate the wonders of God's Creation.

And KEEP LOOKING UP.

March 2006

<p>Nightwatch</p> <p>Twi A: 5:05am Twi A: 7:26pm Moon Rise: 9:04am Moon Set: 11:50pm</p>	<p>Twi A: 5:06am Twi A: 7:25pm Moon Rise: 8:32am Moon Set: 10:39pm</p>	<p>BBAA Meeting</p> <p>Twi A: 5:08am Twi A: 7:24pm Moon Rise: 8:02am Moon Set: 9:27pm</p>	<p>Twi A: 5:09am Twi A: 7:23pm Moon Rise: 7:34am Moon Set: 8:14pm</p>	<p>Twi A: 5:01am Twi A: 7:28pm Moon Rise: 11:12am Moon Set: 2:02am</p>	<p>Twi A: 5:02am Twi A: 7:28pm Moon Rise: 10:23am Moon Set: 12:59am First Qtr: 3:16pm</p>	<p>Twi A: 5:04am Twi A: 7:27pm Moon Rise: 9:40am Moon Set: none</p>
<p>(40) Harmonia Opposition Mercury Inferior Conjunction</p> <p>Twi A: 4:55am Twi A: 7:32pm Moon Rise: 3:09pm Moon Set: 4:58am</p>	<p>Twi A: 4:57am Twi A: 7:31pm Moon Rise: 2:09pm Moon Set: 4:25am</p>	<p>Twi A: 4:58am Twi A: 7:30pm Moon Rise: 1:07pm Moon Set: 3:45am</p>	<p>Twi A: 4:59am Twi A: 7:29pm Moon Rise: 12:08pm Moon Set: 2:58am</p>	<p>Twi A: 4:51am Twi A: 7:35pm Moon Rise: 6:04pm Moon Set: 6:12am Full Moon: 6:36pm</p>	<p>Twi A: 4:52am Twi A: 7:34pm Moon Rise: 5:07pm Moon Set: 5:50am</p>	<p>Twi A: 4:54am Twi A: 7:33pm Moon Rise: 11:08pm Moon Set: 5:26am</p>
<p>Gardenstars</p> <p>Twi A: 4:45am Sun Rise: 6:11am Sun Set: 6:13pm Twi A: 7:39pm Moon Rise: 10:03pm Moon Set: 7:43am</p>	<p>Twi A: 4:46am Twi A: 7:38pm Moon Rise: 9:00pm Moon Set: 7:18am</p>	<p>Twi A: 4:48am Twi A: 7:37pm Moon Rise: 8:00pm Moon Set: 6:55am</p>	<p>Twi A: 4:49am Twi A: 7:36pm Moon Rise: 7:02pm Moon Set: 6:34am</p>	<p>Twi A: 4:51am Twi A: 7:35pm Moon Rise: 6:04pm Moon Set: 6:12am Full Moon: 6:36pm</p>	<p>Twi A: 4:52am Twi A: 7:34pm Moon Rise: 5:07pm Moon Set: 5:50am</p>	<p>Twi A: 4:41am Twi A: 7:41pm Moon Rise: none Moon Set: 8:48am</p>
<p>Venus and Neptune 1.8° apart</p> <p>Twi A: 4:34am Twi A: 7:46pm Moon Rise: 3:52am Moon Set: 1:58pm</p>	<p>Venus Greatest Western Elongation</p> <p>Twi A: 4:35am Twi A: 7:45pm Moon Rise: 3:09am Moon Set: 12:43pm</p>	<p>Twi A: 4:37am Twi A: 7:44pm Moon Rise: 2:18am Moon Set: 11:30am</p>	<p>Third Quarter Moon</p> <p>Twi A: 4:38am Twi A: 7:43pm Moon Rise: 1:19am Moon Set: 10:26am Last Qtr: 2:11pm</p>	<p>Twi A: 4:40am Twi A: 7:42pm Moon Rise: 12:14am Moon Set: 9:32am</p>	<p>Moon and Uranus 1.7° apart Moon and Mercury 2.3° apart</p> <p>Twi A: 4:30am Twi A: 7:48pm Moon Rise: 5:01am Moon Set: 4:31pm</p>	<p>Twi A: 4:32am Twi A: 7:47pm Moon Rise: 4:28am Moon Set: 3:15pm</p>
<p>Venus and Neptune 1.8° apart</p> <p>Twi A: 4:24am Twi A: 7:52pm Moon Rise: 6:58am Moon Set: 9:28pm</p>	<p>Twi A: 4:25am Twi A: 7:51pm Moon Rise: 6:27am Moon Set: 8:14pm</p>	<p>New Moon</p> <p>Twi A: 4:29am Twi A: 7:49pm Moon Rise: 5:30am Moon Set: 5:45pm</p>	<p>Full Moon Lunar Eclipse</p> <p>Twi A: 4:27am Twi A: 7:50pm Moon Rise: 5:58am Moon Set: 6:59pm</p>	<p>First Quarter Moon (9) Metis Opposition</p> <p>Twi A: 4:29am Twi A: 7:49pm Moon Rise: 5:30am Moon Set: 5:45pm</p>	<p>Full Moon Lunar Eclipse</p> <p>Twi A: 4:27am Twi A: 7:50pm Moon Rise: 5:58am Moon Set: 6:59pm</p>	<p>Twi A: 4:27am Twi A: 7:50pm Moon Rise: 5:58am Moon Set: 6:59pm</p>
<p>Venus and Neptune 1.8° apart</p> <p>Twi A: 4:24am Twi A: 7:52pm Moon Rise: 6:58am Moon Set: 9:28pm</p>	<p>Twi A: 4:25am Twi A: 7:51pm Moon Rise: 6:27am Moon Set: 8:14pm</p>	<p>New Moon</p> <p>Twi A: 4:29am Twi A: 7:49pm Moon Rise: 5:30am Moon Set: 5:45pm</p>	<p>Full Moon Lunar Eclipse</p> <p>Twi A: 4:27am Twi A: 7:50pm Moon Rise: 5:58am Moon Set: 6:59pm</p>	<p>First Quarter Moon (9) Metis Opposition</p> <p>Twi A: 4:29am Twi A: 7:49pm Moon Rise: 5:30am Moon Set: 5:45pm</p>	<p>Full Moon Lunar Eclipse</p> <p>Twi A: 4:27am Twi A: 7:50pm Moon Rise: 5:58am Moon Set: 6:59pm</p>	<p>Twi A: 4:27am Twi A: 7:50pm Moon Rise: 5:58am Moon Set: 6:59pm</p>