



# *First Light*

The Newsletter of the Cape Cod Astronomical Society



March, 2012

Vol.23 No.3

*This is REALLY what it's all about!*



*Junior Girl Scout Troop #81309 sparkles at WSO visit February 8, 2012*



**HOW** many moons?



*Stars INDOORS on the Wide Screen!*

[Please see complete story on page 5.]

**Next Monthly Meeting:** is Thursday, March 1st at 7:30pm in the D-Y Library. Michael Farber, JD, an expert on many aspects of the early history of Cape Cod, will present "The Pilgrims--Men and Women of Science and of the Enlightenment".

Public welcome. Please join us. More information on the next page.

**Reminder:** "Dark Saturday" Star Party at the Schmidt, 7:30pm, Saturday, March 18th ; members and public welcome!

**In this issue:** Girl Scouts / New Members / Transit of Venus / Planet Marathon / Observing Resources / CCAS APOM

## **Bright New Stars:**

We are pleased to welcome Tobe Fine and Doc Most to membership in the Society. Doc is a member of the Museum of Science and Technology in Syracuse, NY, and has been involved in amateur astronomy in Syracuse and other areas for many years. Tobe, please let us know more about yourself. Tobe and Doc, please be sure to introduce yourselves the next time you come to a monthly meeting. Welcome!

We like to profile new members in our Society in this section of *First Light* each month. If you are a new member and have not yet been so recognized, or have new information for us (background, astro equipment preferred, interests, etc.) on yourself or someone else, please let us know (email [info@ccas.ws](mailto:info@ccas.ws)).

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**PLEASE CONSIDER SUBMITTING AN ITEM OR ARTICLE FOR PUBLICATION IN *FIRST LIGHT*.**

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## **CCAS News Items and Current Events**

### **Transit of Venus in June:**

Venus will cross the face of the sun before sunset on June 5<sup>th</sup> for Cape Codders. Plan for it now. Planning by CCAS members and the Observatory Staff is underway. Please see the announcement for our May 3<sup>rd</sup> meeting in the column at right. See also the March issue of *Astronomy Magazine*, p 55, for a primer on this event.

### **Successful Imaging and Timing Recording of an Asteroid Occultation:**

Congratulations to Bernie Young and his Schmidt Observatory colleagues for the successful recording of the occultation of a mag 7 star, HIP 12184, a bit earlier than forecast (8:22pm,) on Sunday, January 29<sup>th</sup>. Bernie is planning to provide a scientific report to IOTA on this success.

### **CCAS Meetings:**

Many thanks to Air Force Lt. Col. Shawn Smith for his excellent presentation: **The Use of Phased Array Antenna Technology to Track Earth Orbiting Satellites and Other Objects** at our meeting on February 2nd. Colonel Smith is Commander of the 6th Space Warning Squadron at Cape Cod Air Force Station on the Massachusetts Military Reservation. Part of a four site PAVE PAWS (Phased Array Warning System) net, the squadron is responsible for detecting sea-launched ballistic missiles fired from submarines in the Atlantic Ocean and intercontinental ballistic missiles. Its secondary mission is tracking Earth-orbiting objects such as the International Space Station, the

Space Shuttle, any object that deviates from its known orbit, or any new orbiting objects. Typically, the 6 SWS performs approximately 2,600 satellite tracks totaling about 9,100 observations daily. This unit has protected the East Coast of the United States from sea and land strikes by enemy missiles and more for over thirty years.

Don't miss our meeting on March 1. Michael Farber, JD, an expert on many aspects of the early history of Cape Cod, will present **The Pilgrims--Men and Women of Science and of the Enlightenment**. We all know the Pilgrims were driven to migrate to our shores by issues of religion. After more than four years of research piggy-backing on the works of Morse Payne, historian Farber has found that Winslow and Bradford were truly men of science as they put as much faith in the use of reason when leading the Plymouth Colony as they did in the hands of God. As surveyors, they used science and math to plan boundaries for the towns of Cape Cod, laying claim to those areas before the Puritans arrived from the north. Fascinating subject. Please join us to learn more.

At our meeting on April 5<sup>th</sup>, Mike Renzi, a former member of CCAS, and an amateur astronomer active in the fight against Light Pollution, will visit to share with us some of his ideas in that area. The main feature of his presentation will be showing a film called: **The City Dark**, a documentary made by Ian Cheney about light pollution and the disappearing night sky. This film premiered in competition at the 2011 South by Southwest Film Festival, where it won the Jury Prize for Best Score/Music. After moving to light-polluted New York City from rural Maine, filmmaker Cheney asks: "Do we need the dark?" Exploring the threat of killer asteroids in Hawaii, tracking hatching turtles along the Florida coast, and rescuing injured birds on Chicago streets, Cheney unravels the myriad implications of a globe glittering with lights.

Mike comes to us from his observatory, the Starhoo Observatory, in Lakeville, MA (<http://www.starhoo.com> .)

At our meeting on May 3<sup>rd</sup>, Bernard Young and Jon Greenberg will lead a program called **Understanding and Preparing For the Last (in our Lifetime!) Transit of Venus**. When Venus passes directly between earth and the sun on June 5<sup>th</sup>, we will see the distant planet as a small dot gliding slowly across the face of the sun. Historically, this rare alignment provided data key to our ability to measure the size of our solar system. The upcoming transit of Venus occurs June 5<sup>th</sup> or 6<sup>th</sup> this year, depending on your location. Observers at Cape Cod will watch it on the fifth beginning a bit after 5pm until the sun sets a bit after 8pm. Planning is underway for CCAS and Observatory Staff members to host viewing of the event at The Schmidt Observatory and at least one other location.

This will be the last transit of Venus to occur in our lifetime. Mark your calendar. Plan your observing location and eye safety. Tell friends. Download and support the ToV phone app. Enjoy the rare sight!

And, once more, thanks to Tom Leach who continues to put together great programs of speakers for our meetings.

Members, PLEASE participate in the effort to recruit good speakers to present programs in astronomy and related sciences at our meetings. Please send any ideas or contact information to Tom Leach, our Program Chairman. For sure he will follow up.

Or, even better, volunteer to give a talk yourself!

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### Minutes

The minutes of our February meeting are on our website; click on the "Minutes" button at [www.ccas.ws](http://www.ccas.ws) or go to <http://www.ccas.ws/minutes/ccasminutes020212.pdf>

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**"Dark Saturday" Star Parties** at The Schmidt; 7:30pm:

Mar24 Apr 21 May 19

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As always, "Private" group or individual observing sessions at the Werner Schmidt Observatory may be scheduled by contacting Observatory Director Mike Hunter at [mamhunter@yahoo.com](mailto:mamhunter@yahoo.com) or sending an email to [info@ccas.ws](mailto:info@ccas.ws)

Our Society exists to promote observing! Help us promote this objective by asking for time at the Dome!

CCAS has both 8" and 14" Dobsonian telescopes for loan to members. Currently, Tom Leach is using the 14" for outreach in Harwich. Robert Tobin has the 8". If you wish to borrow one of these 'scopes, contact [info@ccas.ws](mailto:info@ccas.ws)

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### March Observing:

**Observing Highlights for March, 2012 at Cape Cod:**

**Daylight Savings Time begins at 2:00am on Sunday, March 11, 2012**

Please consult the March Issues of *Sky and Telescope* (pp 43-49), *Astronomy Magazine* (pp 36-43), and *Astronomy Magazine Online* (See Ref 4) for more information on these highlight topics and others.

### PLANET MARATHON:

**OK, Cape Codders, go out at 6:55pm on March 1 and you can see Mercury, Venus, and Jupiter in the west, and Mars in the east; use a telescope to see Uranus in the west; and, if you wait until 9:20pm, Saturn rises in the East!**

Here's more information on our amazing planet display in March:

**Mercury** (mag -0.4) is bright enough to see during twilight right after sunset during March's first week. The innermost planet reaches greatest eastern elongation on March 5, when it lies 18° east of the Sun. For an observer at 40° north latitude, the planet stands 11° above the horizon 30 minutes after sunset and sets an hour later.

**Venus** (mag -4.4) reaches its greatest elongation March 27, when it stands 46° to the Sun's east. It lies high in the west after darkness falls thanks to the steep angle of the ecliptic at this time of year. Venus starts the month in a gibbous phase (63% lit,) but, while growing in size as it comes closer to earth on the inside track during the month, it becomes a "quarter Venus" by end of month. Try to observe at least once a week during March and watch it change phase; Venus will be a sliver crescent by the end of April.

**Venus and Jupiter** (mag -2.1) form a pair only 3° apart the evening of March 15. This will be the best conjunction of the two planets for almost 100 years. Don't miss it. Take a photo. And enjoy watching the closing of the two for days before the 15<sup>th</sup> and slow separation days after as Jupiter slides toward the horizon night-to-night relative to Venus.

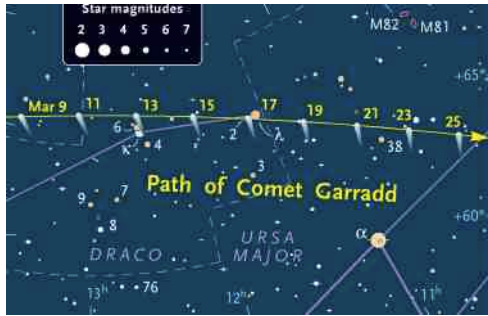
March sees its namesake, **Mars** (mag -1.2, 14") reach peak visibility for this visitation cycle on March 3 when it is at opposition. It will be more than two years until we see Mars as big and bright again.

**Saturn** rises shortly before 10 p.m. local daylight time in mid-March.

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### **Comet C/2009 P1 (Garradd) Returns; still mag 6 or 7:**

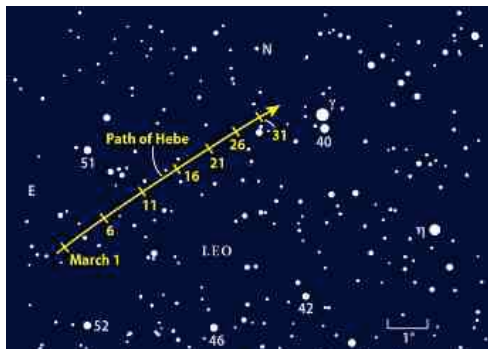
Comet Garradd has been good to us on this its first trip into the solar system. After running close to the horizon for a while in March and the next month or so last year, it is now nicely positioned in "the Dippers" for Cape Codders. Since now circumpolar, it is visible all night.; as shown in the following finder chart, it moves towards Ursa Major in March arriving near  $\alpha$ -Ursa Majoris on March 21. Astrophotographers: try Garradd paired with the galaxy NGC 4236 on March 13; or near M81 on March 20.



[Garradd moves near  $\alpha$ -Ursa Majoris March 21.]

**Mag 9.5 Asteroid Hebe Stars in Leo March:**

Look for the mag 9.5 asteroid Hebe as it travels toward  $\gamma$ -Leonis in Leo during March. The finder chart here shows it nearing that mag 2 star on March 31. Try to follow it every six days or so as it moves through Leo.



[Asteroid Hebe moves near  $\gamma$ -Leonis March 31]

**Resources for Jupiter and its moons:** if you don't have *Gas Giants*, the iPod/iPad app for moons of Saturn and Jupiter discussed in the April, 2011 *First Light*, please see the March *S&T*, p 47; March's *Astronomy*, p 37, or the interactive resource online at reference 5 for positions of Jupiter's moons for any date and time.

Anyone having an interest in monthly **Libration and Declination Tables for the Moon**<sup>2</sup> during this month please contact your editor for information or sources.

**Three minima of Algol**<sup>1,3</sup> occur in Prime Time for Cape Codders in March: at 10:25pm EST on March 5<sup>th</sup>, at 7:15pm EST on March 8<sup>th</sup>, and at 11:11pm EDT on March 25<sup>th</sup>.

Begin observing 3 hours before or peek now and then the 3 hours before and after the minima to watch the dimming and brightening.

**Mooncusser's Almanac and Monthly Alert**<sup>1</sup>  
By Peter Kurtz  
**March 2012**

Object	Mar. 1 (EST)	Mar. 15 (EDT)	Mar 31. (EDT)
<b>Sun</b>	R: 06:14 S: 17:31	06:51 18:47	06:24 19:05
<b>Moon</b>	R: 10:53 S: 01:47	02:41 12:05	12:32 02:49
<b>Mercury</b> <i>(eve then dawn)</i>	R: 06:50 S: 19:01	06:58 19:45	05:41 17:39
<b>Venus</b> <i>(evening)</i>	R: 07:51 S: 21:19	08:29 22:45	08:06 23:11
<b>Mars</b> <i>(evening)</i>	R: 17:30 S: 06:49	17:08 06:40	15:43 05:24
<b>Jupiter</b> <i>(evening)</i>	R: 08:30 S: 22:12	08:42 22:31	07:48 21:45
<b>Saturn</b> <i>(late evening)</i>	R: 21:19 S: 08:25	21:21 08:28	20:12 07:23
<b>Uranus</b> <i>(evening)</i>	R: 07:07 S: 19:19	07:14 19:28	06:13 18:29
<b>Neptune</b> <i>(dawn)</i>	R: 05:52 S: 16:35	05:58 16:42	04:56 15:42
<b>Pluto</b> <i>(late night)</i>	R: 02:47 S: 12:31	02:53 12:37	01:50 11:34

**Moon Phases, March, 2012**

- Full Moon** Thursday, March 8<sup>th</sup>, at 4:39am EST
- Last QTR** Wednesday, March 14<sup>th</sup>, at 9:25pm EDT
- New Moon** Thursday, March 22<sup>nd</sup>, at 10:37am EDT
- First QTR** Friday, March 30<sup>th</sup>, at 3:41pm EDT

## **Feature Story:**

### **Junior Girl Scout Troop #81309 Sparkles at WSO Visit February 8, 2012**

...by Joel Burnette

Junior Girl Scout Troop #81309 visited the Werner Schmidt Observatory (WSO) Wednesday, February 8, 2012, for hands-on and computer-generated lessons in stargazing. Eight 4th and 5th grade girls and eight parents and troop leaders drove in from Dennis, Yarmouth and Brewster for fun and education by seven members of the Cape Cod Astronomical Society and WSO staff.

“Except for cloudy skies, the evening was a big success,” smiled WSO Director Mike Hunter. “The girls were cheerfully attentive to demonstrations, and jumped right into questions and answers.”

Joel Burnett, WSO staff member, hosted the visit, with opening lessons on star systems and telescope workings, rewarding correct answers with packets of hot chocolate.

“These Junior Girl Scouts already knew some astronomy basics such as which color stars are hottest and the quarters of the moon,” said Joel. “They were delighted to learn about star nebulas and watch on our new High Definition TV screen how constellations circle Polaris, the North Star.”

Mike Hunter and Gail Smith opened the observatory dome and showed the girls how we use a computer with the Sky 6 planetarium software to “drive” the MEADE LX200GPS telescope to find most any celestial beauty the girls could want to see, at least if the skies cleared up.

Bernie Young introduced the Scouts to the WSO’s 18” Dobsonian telescope. He earned wows for his video capturing January 29th’s four-second asteroid (1746 Brouwer ) occultation of Star HIP 12184 for which he had planned months in advance. Bernie was the only person of several across the United States who had success in trying to observe this star blinking off and on with the passage of the irregularly shaped rocky body; he was doubly rewarded with the discovery that the blinkout occurred 17 seconds earlier than predicted.

While the Junior Girl Scout insignia do not include a badge specifically for space, “we like to expose the girls to something new whether it leads to a badge or not,” said the Troops’ Co-leader, Marcia Fredricks. “We’re looking forward to coming back to the observatory for Star Parties when the weather gets warmer!” remarked Troop Co-Leader Nancy Voutour-Waldron, bundled as were the rest of the visitors and staff in coat and mittens.

“Even though tonight was overcast, we had a great time and learned a lot!”

[Congratulations to the Scout leaders, parents, CCAS members, WSO staff, and a great group of Girl Scouts who made this cloudy evening bright at the WSO. Ed.]

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## **OBSERVING RESOURCES:**

### **Introduction to Lunar and Asteroidal Occultations:**

A very good introduction to observing Lunar and Asteroidal Occultations of stars is available at

[http://www.poyntsource.com/IOTAMannual/Introduction\\_to\\_Occultations.htm](http://www.poyntsource.com/IOTAMannual/Introduction_to_Occultations.htm)

(When the url opens, click on “INTRODUCTION TO OCCULTATIONS”)

This is an eleven page introduction provided as a brief 8-page PDF tutorial written by Paul Maley with assistance of R. Nugent, both associated with IOTA, the International Occultation Timing Association.

Thanks to Bernie Young for providing us an alert to this informative document.

### **Visualizing the Scale of the Universe; "from Quark to Universe edge"**

Richard Schwartz. a "Friend of CCAS" and former teacher of Astronomy at CCCC who brought his students to The Schmidt a few years ago, sent us the web address for this entertaining and educational website: <http://htwins.net/scale2/>

Do visit this application for a great experience. Thank you, Richard!

[Another good resource for visualizing distances and the sizes of things in our universe (down, again, to quark, if you wish) is a video called, "Powers of Ten", a YouTube video. Go to <http://www.youtube.com/watch?v=0fKBhvDjuy0>

This one you can store on your computer or iPod, etc., as you wish.]



## Key Articles in Sky & Telescope on Amateur Contributions to Understanding Variable Star Phenomena:

Certain CCAS members have long had an interest in making visual estimates of the brightness of variable stars at various stages of their brightening and dimming light curve cycles. Many of you will remember reports in First Light several years ago about our participation in AAVSO's (American Association of Variable Star Observers) "Citizen Sky" campaign to have individual amateur astronomers take visual observations during the once-every-twentyseven-years dimming of the "mystery" star, Epsilon-Aurigae. With the AAVSO celebrating its 100<sup>th</sup> Anniversary late last year, it is more than appropriate that the March, 2012 issue of S&T featured the following three stories celebrating both "visual" observing and high tech in our new understanding of the phenomena causing the "peculiar" dimming cycle in Epsilon-Aurigae:

- Page 8. A Letter to the Editor by Mario Motta (President of AAVSO) and colleagues emphasizing the importance of amateurs engaging in visual observations of variable stars;
- pp 18 – 28. A comprehensive report of how a mix of amateur observation and high technology combined during the recent dimming cycle for Epsilon-Aurigae to finally bring a definitive understanding of the mechanisms behind the "peculiar" light curves of the star.
- pp 20-23. A most interesting side-bar article on amateurs using spectroscopy to help elucidate understanding of phenomena in Epsilon-aurigae.

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## CCAS Member APOM

Several CCAS members are developing real expertise in astrophotography and sending samples of their success to First Light. So, when we have good material, room, and time, we will highlight the best as CCAS APOM's, aka, Astrophotographs of the Month.

This month we have two remarkably good photos of M42, the Great Orion Nebula, taken in recent months by Tom Leach and Mike Hunter. Both are "medium time" exposures taken with Canon Digital cameras using midsize telescopes on tracking mounts as lenses. Thanks Tom, and Mike for letting us all see the results of your evolving expertise.

### *The Great Orion Shootout!*



M42 – Tom Leach, November, 2011  
Camera: Canon EOS Rebel T12i  
Scope: 10" Meade Schmidt-Newtonian  
Mount: Meade LXD 75 German Equatorial  
Exposure: 30 seconds; ASA 1600

Processing: None



M42- Mike Hunter, February, 2012  
Camera: Canon EOS Rebel xs (1000D)  
Scope: 8" Schmidt Newtonian  
Mount: hypertuned Meade LXD55 German Equatorial  
Exposure: 10 exposures of 69 seconds stacked using  
Nebulosity

moderate decrease in brightness, increase in contrast using  
PhotoShop Elements

**High Quality Binoculars available for sale by CCAS Member:**

CCAS member Steve Shuart asked Tom Leach to road test a pair of Russian manufactured binoculars (7x50) by Tenta. Steve has several pairs he would like to sell at a nice price to CCAS members (in the \$100 range). Solid aluminum bodies, excellent collimation, and precision Zeiss lenses. “When I held these beauties up to the horizon for the first time it was obvious they were tack sharp and could pick out the galloping elephants (waves) on the horizon. These made my Bushnell's seem dim.” ...includes yellow and blue filter inserts; central focus, rubber eye cups, lens caps, leather strap, a real leather case (that even smells rich), an eight page manual in Russian and German with a page entitled “Handling Rules”. Please contact Steve at 508-432-1414.



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**A PORTION OF THIS PAGE IS  
INTENTIONALLY LEFT BLANK TO REMIND  
ALL MEMBERS THAT THERE IS ALWAYS  
PLENTY OF ROOM IN *FIRST LIGHT* FOR  
YOUR CONTRIBUTIONS**

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## Cape Cod Astronomical Society

President	Tom Leach	508-237-9291
Vice President	Michael Hunter	508-385-9846
Secretary	Charles Burke	508-394-9128
Treasurer	Peter Kurtz	508-255-0415
Observatory Director	Michael Hunter	508-385-9846
<i>First Light</i> Editor	Peter Kurtz	508-255-0415

[info@CCAS.ws](mailto:info@CCAS.ws)

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## Cape Cod Astronomical Foundation

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Vice Chairman	Michael Hunter	508-385-9846
Director R&D	Bernie Young	508-394-1960
Secretary	Ed Swiniarski	508-896-5973
Treasurer	Pio Petrocchi	508-362-1213
Observatory Director	Michael Hunter	508-385-9846
Observatory		508-398-4765

The **Cape Cod Astronomical Society** meets at 7:30 pm on the first Thursday of every month in the library of the Dennis-Yarmouth Regional High School in Yarmouth, Massachusetts. Meetings are open to the public. Membership dues are \$30 for adults, \$15 for students in two year colleges and part year residents, and no charge for spouses or for students in K-12 schools.

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### References and Notes for this issue:

- 1) Information for The Mooncussers Almanac and Monthly Observing Alerts was extracted from Sky Events, Astronomy Magazine Online (Astronomy.com), Stargazing.net's Planet Rise/Transit/Set calculator (<http://www.stargazing.net/mas/planet2.htm>), *Astronomy Magazine*, *Sky & Telescope Magazine*, *Sky and Telescope Skywatch 2011*, and other sources. The *Observer's Handbook, 2010 and 2011*, published by The Royal Astronomical Society of Canada is also an important reference, particularly for information on lunar libration and declination and the minima of Algol.
- 2) Information on how Libration and Declination Maxima and Minima can make visible parts of the moon normally hidden was reviewed in the December 2007-January 2008 *First Light*. Quick recap: Max Long brings to view extra right side; Min Long, extra left side; Max Lat, extra north side; Min Lat, extra south side. Max Dec puts it high in our sky during its transit; Min Dec puts it low.
- 3) Algol is an eclipsing variable star in Perseus which has its brighter component eclipsed or covered by its companion once every 2.87 earth days. When the dimmer component is not eclipsing the brighter, Algol appears typically about magnitude 2.1; when eclipsed, magnitude 3.3 The minima usually lasts about two hours with two hours on either side to bring it back to mag 2.1. Good comparison stars are  $\gamma$ -Andromedae to Algol's west, mag 2.1, and  $\epsilon$ -Persei to its east, mag 2.9.
- 4) Here is the web address for Astronomy Magazine's online "The Sky This Month" online for March: [http://www.astronomy.com/en/News-Observing/Sky\\_this\\_Month/2012/01/Mars\\_returns\\_to\\_glory.aspx](http://www.astronomy.com/en/News-Observing/Sky_this_Month/2012/01/Mars_returns_to_glory.aspx)
- 5) *S&T's* interactive Java utility for showing the positions of Jupiter's main moons for any date and time: <http://www.skyandtelescope.com/observing/objects/planets/3307071.html>