



First Light

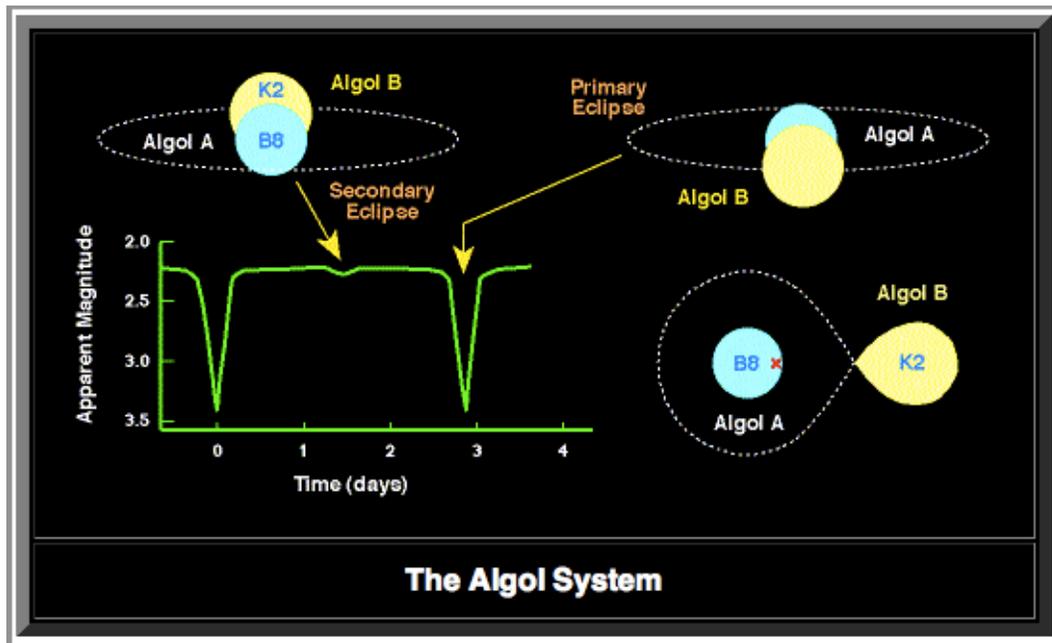
The Newsletter of the Cape Cod Astronomical Society



February, 2013

Vol.24 No. 2

Have an Interest in Variable Stars?



Algol, perhaps the best known Variable Star, dims from brightness mag 2.1 to mag 3.3 every 2.9 days. This chart⁴ shows the Light Curve and a schematic suggesting how the dimmer of two components (k2) can cause a decrease in the total light coming to earth from the system if, during the mutual rotation of the two in an essentially circular orbit, it gets in front of the brighter component (B8) as viewed from earth.

Want to know more about Variable Stars? Come to the presentation, “How to Enjoy Observing Fast and Slow Variable Stars” at the CCAS February meeting.

In this issue: Bright New Stars / Special Contributions to CCAF / Fifth Graders to Visit The Schmidt / “Globe at Night” / Mercury: a Photo-op in February / a special Jupiter lineup / Minima of Algol / Ceres and Vesta / Moonshot

Bright New Stars:

Your editor visited Dennis-Yarmouth High School on January 24th and presented a brief introduction to Variable Stars to Jim Mitchell's Earth and Space Class. We are happy to report that during the class, nine students signed up to become CCAS Student Members. Please welcome Meghan, Rusty, Ben, Taylor, Alison, Khalil, Michaela, Nick, and Ariana to our club! As with other members, these students will receive one email a month inviting them to access the latest issue of *First Light* online. We do hope to see them at many upcoming meetings and Star Parties.

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 might have new information for us (background, astro equipment preferred, interests, etc.) on yourself or someone else, please let us know (email info@ccas.ws).

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

CCAS News Items and Current Events:

We would like to announce that at the end of 2012, three significant contributions were made to the Cape Cod Astronomical Foundation for general support and capital needs.

Many thanks to "Anonymous" and to Gail Smith for their support. We also wish to thank Bill and Pauline Boyd who sent a contribution in honor of recently deceased CCAS former president and astronomy teacher Jon Greenberg.

Donations to the Foundation are always welcome and are critical to our ability to continuously modernize equipment and protocols that let us enjoy the sky and conduct astronomy research and teaching projects.

Fifth Graders to Visit The Schmidt Observatory:

Joel Burnett, Observatory Director, has informed *First Light* that on three consecutive Friday nights: Feb 1, Feb 8, and Feb 15, a total of about 80 Fifth Grade students from Eddy Elementary School and accompanying parents will visit in groups of about 30 people at one of two sessions each night until all have been accommodated. Our visitors will learn about the Society and our Observatory and have their first opportunities to learn a bit about constellations, and view the moon, Jupiter, a variable star, possibly an asteroid, the Orion Nebula, and other targets of choice using Observatory observing equipment. *Any members who would like to assist the Observatory Staff on any of these evenings please contact Joel or Peter.*

CCAS Meetings:

Many thanks to CCAS member and active CCAS Star Party participant, Lee Labarre for his presentation "**Designing, Building, and Using a Home Observatory**" at our meeting on January 3rd. Lee asked the question, "Why build a home observatory?" Advantages are pier stability, better access to the telescope and rapid setup for observing sessions.

Disadvantages include the constraints of a fixed location with possibly limited views. Home Observatory types include everything from small shelters to major structures. When planning location, one should consider areas that offer the best views, accessibility of electrical power, and cost. Will you construct the observatory yourself or use a contractor? Lee's observatory was built partly by a contractor followed by many hours of his own time. It features a poured concrete foundation and a fixed steel pier. The pier has a Celestron 9.25 Telescope mounted on a special adapter plate. Rather than build the unit from raw materials, Lee purchased a pre-built garden shed, saving time.. The shed features easy access and good ventilation, plus stability in bad weather conditions. His goal for the future is to utilize the observatory for astrophotography.

Peter Kurtz, Treasurer of CCAS, *First Light* editor, and member of the Observatory Staff, will present "**How to Enjoy Fast and Slow Variable Stars**" at our February meeting. We will review the basics of recording magnitude estimates from naked eye or magnified observations of variable stars, and (as you wish) reporting your observations to AAVSO (American Association of Variable Star Observers.) Main classes and favorite VS targets will be reviewed.

For the March meeting, former CCAS president, Gary Derman, will present a program called "**Where is that star?**" If you ever wondered how today's go-to telescopes know where to point to find a sky object or how planetariums can present the sky as it appeared from 2,000 years ago to 2,000 years from now, this talk is for you. Don't worry. You will not have to deal with complex equations. We will talk about what the mathematics is doing, but only in terms that everyone will understand.

Recently joined member Harvey Patachnik will speak on "Design and Building of a Home Observatory" at our May meeting.

Mark your calendars: Larry Marschall, Professor of Physics associated with Gettysburg College, will speak on "**Wrong Way Planets and Other Strange Solar Systems**" at our meeting on July 11th. Dr. Marschall is the author of two books on astronomy: *GALILEO'S NEW UNIVERSE* and *PLUTO CONFIDENTIAL* and has taught courses in astronomy, physics, and science writing at Gettysburg. Whatever Dr. Marschall brings to CCAS is always interesting and informative.

No, that's not a mistake! The CCAS meeting for July will take place on the 2nd Thursday of the month, July 11th, to work around the 4th of July holiday.

February Observing:

Program planning is in progress to confirm speakers and topics for our April and June meetings.

Thanks to Mike Hunter, our Program Chair, for lining up these special topics and speakers; we also thank Lee, Peter, Gary, Harvey, and Dr. Marschall for agreeing to present.

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 Mike Hunter, our Program Chairman. For sure he will follow up.

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

Minutes:

The minutes of our August meeting are on our website; click on the "Minutes" button at www.ccas.ws or go to <http://www.ccas.ws/minutes/ccasminutes010313.pdf>

From the Dome:

Reminder:

The next "Quarter-Moon-Saturday Star Party will take place Saturday **February 16th** beginning at 7:30pm. Remaining dates this winter season are:

Mar. 16	April 20
May 18	June 15

As always, "Private" group or individual observing sessions at the Werner Schmidt Observatory may be scheduled by contacting Observatory Director Joel Burnett at Joelburnett@comcast.net or sending an email to 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. If you wish to borrow one of these 'scopes, contact info@ccas.ws

Globe at Night is an international citizen scientist project to measure the degree of light pollution all around the world using the human eye.

Globe at Night is beginning its worldwide 2013 campaign.

The organization provides multiple versions of star charts for local constellations at various times during the year. Six versions of the chart for the sky containing Orion, for example, might be provided online: one chart shows only the brightest stars ("mag 1 chart"), the next shows stars to mag 2, etc... to a chart which shows stars to mag 7.

Globe at Night asks that citizens go out and look at a constellation seasonal in *their* sky and pick which of the mag charts provided online most closely resembles the stars one can see that night and asks that you report your observation online. You supply either your latitude and longitude or a street/town/zip address, comments on location (e.g., streetlights?), click on the magnitude chart that most looks like *your* sky night of your observation, and comments on the sky (e.g., partly cloudy?).

You can look at results for any given year on a worldwide map on which you can zoom down to see even individual sky ratings for your and nearby locations.

First Light highly recommends all CCAS members and friends participate in this adventure. It's fun, it's quick, it's easy, and the results provide useful information to persons advocating less light pollution in our world.

There are four time frames in which to get involved this time around (generally when the moon is below the horizon during evening viewing hours:

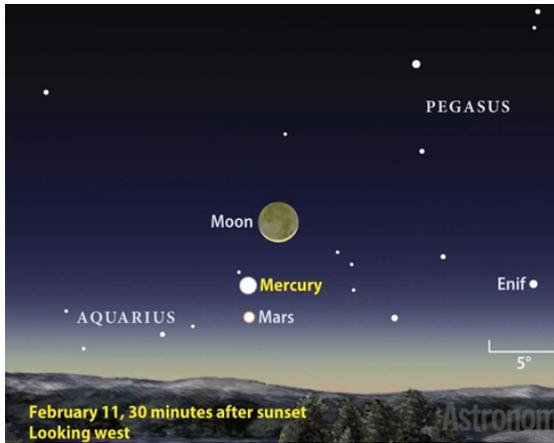
January 31 - February 9, 2013
March 3 - 12, 2013
March 31 - April 9, 2013
April 29 - May 8, 2013

Please see reference 7 for online resources.

OBSERVING HIGHLIGHTS FOR FEBRUARY, 2013 **AT CAPE COD:**

February is Mercury Month Again: The deepening twilight offers a pretty background for observers seeking their first glimpse of **Mercury** during 2013. The innermost planet spends the first two weeks of February climbing higher in the evening sky. On the 1st, Mercury shines brightly at magnitude -1.1 and sets nearly 50 minutes after the Sun. You should be able to spot it through binoculars some 3° high in the west-southwest about a half-hour after sunset. Getting easier to see each passing day, it approaches closer and closer to dimmer Mars during the first week of the month, passing to the north of the red planet after a very close encounter on the 8th. A slender crescent moon joins the pair on 2/11. The artist's rendition of this event just

below (from the February issue of *Astronomy* magazine)



brings to mind a photo encounter your editor had with Mercury five years ago also in February. That time the partner was Venus rather than Mercury. This photo was



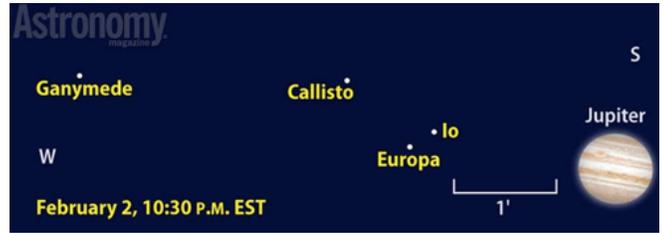
taken 2/12/07 just after sunset at Skaket Beach (exposure: f3.2, 1 sec, ISO 400.) Here mercury red dot at end of arrow is below and to the right of Venus.

Photography of Mercury in the cold clear air of February is always rewarding. See what *you* can do from the beginning of the month through the encounter with the moon on the 11th.

Jupiter and its Moons continue to “Star” in February:

Mercury and dimmer **Mars** do their early evening dance in early February, and spectacular **Saturn**, now in the sky after midnight will soon become a “main event” in evening. But for now, **Jupiter** and its moons continue to be the big stars. Do look to see “what the moons are doing” as often as you can this month; see our list of resources in the next column.

Of special note is the lineup of the Galilean moons “all on one side on February 2nd”; one wonders if such a lineup makes for “spring tides” on one side of Jupiter.



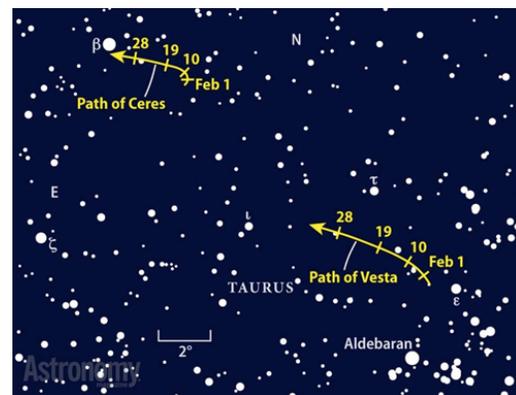
Minima of Algol: Given that the mechanism of dimming and the light curve for the “fast” Variable Star Algol is given on page 1 and that “**How to Enjoy Fast and Slow Variable Stars**” is the topic of the night for our upcoming meeting, Algol and its dimming must take a special bow this month. What better way to introduce yourself to the wonder and fun of observing variations in the brightness of “variable” stars that watching the dimming and re-brightening of Algol through one of its frequent three day dimming cycles.

This month, a minimum of brightness is reached at 2:33am EST on Tuesday, February 10th; a minimum also occurs at 11:23pm on Tuesday February 12th.

Of greatest interest may be that a *prime time minimum* occurs during one of our “observing sessions” with Eddy Elementary School Fifth Graders... at 8:12pm on Friday, February 15th.

Please see the text in Reference 3 for more information.

Finally, bright asteroids **Ceres** and **Vesta**, both about mag 8 and nicely placed in the sky for evening viewing, move slowly on either side of Jupiter in Taurus during February. Try to make at least two observations during the month to confirm that these minor planets are indeed wanderers and not fixed stars.



General Observing Resources: Please see the February issues of *Astronomy Magazine*, pp 36-43 and *Sky and Telescope*, pp43-58, and Reference 5 for observing highlights for February.

Resources for the moons of Saturn and Jupiter:

The February issues of *Astronomy Magazine*, p 41 and *S&T*, page 52, give the positions of Jupiter's main moons at any date and time during the month. A chart on page 53 of the *S&T* issue lists the times and dates during the month for special phenomena of the moons such as occultations behind the planet, reappearances, etc.

ONLINE: 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 interactive resources online at reference 6 for positions of Jupiter's or Saturn's moons for any date and time.

Moon Phases, February, 2013

Last QTR Sunday, February 3rd, at 8:56am EST

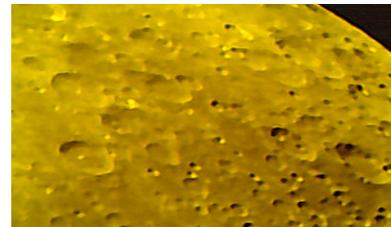
New Moon Sunday, February 10th, at 2:20am EST

First QTR Sunday, February 17th, at 3:31pm EST

Full Moon Monday, February 25th, at 3:26pm EST

CCAS ASTROPHOTO OF THE MONTH:

Thanks to Bernie Young for sending this photo and information pertaining thereto in to *First Light*:



This photo of the moon was taken near sunset in Vermont last September using our electronic eyepiece USB video camera and 8" f/6 dob and was stored on a laptop. The moon drifted through the video frame in a few seconds. The digital video file and was recently processed using Registrax 6 software which tracked the moving image, aligned and stacked about a second's worth of frames, and sharpened the result with a gaussian wavelet filter.

Image processing is just one example of an astronomical activity that can be done at home at no cost by someone with a computer and an internet connection. Just get a digital video file, do a keyword internet search on "Registrax 6", and you're off.

Mooncusser's Almanac and Monthly Alert¹
FEBRUARY 2013

Object	Feb. 1 (EST)	Feb. 15 (EST)	Feb. 28 (EST)
Sun	R: 06:52 S: 16:56	06:35 17:14	06:16 17:30
Moon	R: 22:40 S: 09:27	09:11 23:01	20:38 07:34
Mercury (dawn)	R: 07:29 S: 17:44	07:16 18:47	06:16 18:12
Venus (predawn)	R: 06:14 S: 15:44	06:14 16:18	06:06 16:50
Mars (early evening)	R: 07:42 S: 18:19	07:14 18:21	06:46 18:22
Jupiter (all nite)	R: 11:47 S: 02:33	10:53 01:40	10:05 00:54
Saturn (predawn)	R: 00:13 S: 10:47	23:19 09:53	22:27 09:01
Uranus (evening)	R: 09:04 S: 21:23	08:10 20:31	07:21 19:43
Neptune (early evening)	R: 07:46 S: 18:32	06:52 17:39	06:02 16:50
Pluto (early evening)	R: 04:46 S: 14:25	03:52 13:32	03:02 12:42

Anyone having an interest in monthly **Libration and Declination Tables for the Moon²** during this month please contact your editor for information or sources.

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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Treasurer	Peter Kurtz	508-255-0415
Observatory Director	Joel Burnett	508-221-7380
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Secretary	Ed Swiniarski	508-896-5973
Treasurer	Pio Petrocchi	508-362-1213
Observatory Director	Joel Burnett	508-221-7380
Observatory Phone Line		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.

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 December2007-January2008 *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 γ -Andromedae to Algol's west, mag 2.1, and ϵ -Persei to its east, mag 2.9.

4) <http://csep10.phys.utk.edu/astr162/lect/binaries/algol.html>

5) Here is the web address for Astronomy Magazine's "The Sky This Month" online for February:
<http://www.astronomy.com/en/News-Observing/Sky%20this%20Month/2012/12/Mercurys%20twilight%20romp.aspx>

6) *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> :

for Saturn's moons: <http://www.skyandtelescope.com/observing/objects/planets/3308506.html>

7) Resources introducing "Globe at Night" and the campaign to "map" both dark and light-degraded skies worldwide:

- General and Introduction: <http://www.globeatnight.org>
- An app that allows you to select an area for which you would like to see sky ratings for the current campaign or past years: <http://http://www.globeatnight.org/analyze.html>
- Globe at night magnitude charts for various seasons and locations: Google "Globe at Night Magnitude Charts".
- Web App for reporting your location and results: <http://www.globeatnight.org/webapp/>
- Web address to see various winter/early spring magnitude charts for 40N:
http://www.globeatnight.org/observe_magnitude_orion.html