



# First Light

The Newsletter of the Cape Cod Astronomical Society



March, 2016

Vol. 27 No. 3

*A Special Viewing Opportunity During March: Jupiter's Moons and Their Shadows Marching Across the Planet in Prime Time!....*



*Take out your own telescope or ask for opening of The Schmidt Observatory in prime time during the night of Monday, March 14, to see Io and Europa, together with their shadows, march across Jupiter from 9:27pm thru 12:37am. Europa leads the way followed by its shadow, then Io (below Europa's shadow) followed by Io's shadow. Many similar events take place other nights in March. This month, Jupiter is at opposition: at its brightest and largest. Story on p 5.*

*...Sky Safari Simulation on iPhone5*

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**Our Next Monthly Meeting:** is Thursday, March 3<sup>rd</sup>, at 7:30pm in the D-Y High School library. CCAS President Michael Hunter will present **LIGO: Laser Interferometer Gravitational-Wave Observatory: A Brief Introduction and Overview of a Millennial Event.** Many scientists view the successful observation of G-waves a key event in the history of science. Come to our meeting and find out why. Public always welcome.

**Reminder:** The next "Quarter-Moon-Saturday" Star Party (public welcome) is Saturday, March 12<sup>th</sup>, at 7:30pm. We are also continuing once-a-month "New-Moon-Saturday" "work" evenings for *Staff and CCAS Members only*: March 5th. Please see more information on both these opportunities with schedules on page 3.

**In this issue:** Jupiter Moons / New Member / a Sickness in America / Vernal Equinox / Daylight Savings Time /

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### **Bright New Stars:**

We welcome George Silvis of Bourne to membership in CCAS. George found out about us by way of his interest in occultations (movement of one heavenly body in front of another as viewed from earth) and visited our February meeting.

George is an experienced amateur astronomer, having a 12" LX200 mounted in a pod dome behind his house, is interested and experienced in photometry and astro imaging using a CCD camera system, and is member of the AAVSO. He works extensively in software development projects with AAVSO.

George, we hope you will share your experience and talents with CCAS members and will get involved with public and student outreach efforts and research projects at our Schmidt Observatory.

Welcome to CCAS!

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](mailto:info@ccas.ws)).

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

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

#### **Special Alert**

#### **Excellent Essay on the "Disappearing" of the Understanding of Science in America Today:**

Folks who subscribe to *Astronomy* magazine can sign up to receive periodic emails from *Astronomy* which key to interesting subjects and articles available either online or in the print issue of the magazine. Because I am a subscriber to the magazine and this email service, I recently received an email alerting me to the availability of a very important essay by the Editor of *Astronomy*, David Eicher:

"A Sickness Over the Land... Why Scientists Believe What They Do and Why The Public, Too Often, Does Not Go Along".

(Please see Reference 6 on the last page of this *First Light*.)

Please take the time to read this very important discussion on a serious problem in our America of 2016... a problem which already is advanced... a problem that gets worse and worse as time goes along:

...the inability of many people to distinguish reality (as determined by scientific inquiry) from inaccuracies based on all kinds of input that have no supporting data.

Putting it another way: the public does not understand information supported by

science; people are increasingly distracted by misinformation and opinion, and do not know the difference.

We, as amateur astronomers, need to understand this problem and do anything that we can by way of our outreach to students and our neighbors and friends to aggressively fight this "sickness" in our communities. Please read Eicher's essay and take up the challenge!

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### **CCAS Meetings:**

Many thanks to Cape Cod's Hugh Blair-Smith for his engaging and informative presentation of "*Left Brains for the Right Stuff*" at our meeting on February 4<sup>th</sup>. We learned much about computers, space, and the history of the space race and our Apollo program. The title of his talk is the same as the title of his new book...and covers what computers did for the space race, what the space race did for world history, and a bit about Hugh's own work in creating computer programs important to US space flight. It is clear from Hugh's presentation that he views the entire Apollo era as a heroic and important event in American history. His view produced a very enthusiastic and thought-provoking presentation. Thank you, Hugh.

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We are pleased to announce that CCAS President Michael Hunter will present **LIGO: Laser Interferometer Gravitational-Wave Observatory: A Brief Introduction and Overview of a Millennial Event** at our meeting on March 3.

[Professor Larry Marschall of Gettysburg College was originally scheduled to speak in March but his visit had to be postponed until our July meeting. See below.]

On Thursday, February 18, 2016, scientists from the California Institute of Technology and the Massachusetts Institute of Technology announced that they had measured gravitational waves (G-waves), ripples in spacetime. The actual measurement took place on September 14, 2015 at Hanford, Washington and Livingston, Louisiana. G-waves were first predicted, one hundred years earlier, by Albert Einstein's Theory of General Relativity.

Dr. Hunter will describe the concept of gravitational waves using non-technical terms. He will follow with an overview of the twin observatories at Hanford (Caltech) and Livingston (MIT) and then a discussion of G-waves and future research.

It is expected that the Cape Cod Astronomical Society will host a more detailed and technical presentation on the topic in the near future.

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Joel Burnett, Director of our Schmidt Observatory will speak on "**The State of the Observatory**" at the CCAS meeting on Thursday, April 7<sup>th</sup>.

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Bernie Young, Director of Research at the Schmidt Observatory will discuss “**The Transit of Mercury**” at the CCAS meeting on Thursday May 5<sup>th</sup>.

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Looking ahead, we are very pleased to report that **Professor Larry Marschall** of Gettysburg College, astronomer, teacher and always an excellent speaker, will speak to us at the CCAS meeting on July 7th on new information about **Pluto** gleaned from data collected by NASA’s New Horizons mission to Pluto. More information when available.

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**Reminder:**

Gus Romano (or his delegate) “hosts” a Dutch-treat dinner gathering for members and friends on each CCAS meeting night (before the meeting) at the South Yarmouth Hearth & Kettle restaurant at 5:45pm; (the meetings begin at 7:30 at D-Y.) The speaker for each meeting is always invited.

Please join the group to dine and talk about all things interesting, including astronomy! The H&K is at 1196 Rte 28, South Yarmouth, about a half mile west of the Station Avenue/Main Street intersection with Rt. 28 (traffic light).

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Mike Hunter, CCAS President, is our Program Chairman. Please contact Mike or [info@ccas.ws](mailto:info@ccas.ws) if you have any leads on speakers for June or August and beyond.

Members, *PLEASE* participate in the effort to recruit good speakers to present programs in astronomy and related sciences at our meetings.

Please let us know if you have any leads...

**or, even better, volunteer to give a talk yourself!**

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The 2015-2016 **Dues cycle** began at our July meeting. Dues for most folks are \$30/year. We need this money to pay our bills and support our Observatory! Please bring your check to the next meeting or mail right away to: CCAS, 34 Ridgewood Rd. Orleans MA 02653. Thank you.

Thank you all for a very good response this time around. We still have several active members who are more than a year in arrears. Please, everyone, “get current” as soon as possible.

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The Cape Cod Astronomical Foundation is now participating in the AmazonSmile program (<http://www.smile.amazon.com>); please go to this Amazon login page and sign up. Going forward, 0.5% of the price of all your Amazon purchases will be donated to the Cape Cod Astronomical Foundation when you are a signed-up participant.

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The minutes of the February meeting are on our website;

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click on the “Minutes” button at [www.ccas.ws](http://www.ccas.ws) or click here <http://www.ccas.ws/minutes/ccasminutes020416.pdf>

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**From the Dome:**

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CCAS Members: Once again: There are many good things happening these days at The Schmidt. Please consider involving yourself. Contact Bernie or Joel directly if you can help or notify us at [info@ccas.ws](mailto:info@ccas.ws) and we’ll pass your interest along.

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**“Winter” Schedule of “Quarter-Moon-Saturday” Star Parties Continues:**

Want to know what a “Quarter-Moon-Saturday” Star Party is? Our website (“Star Parties and Activities Info” button) describes it this way:

From September thru June, we will have one regularly scheduled Star Party each month at 7:30pm – 9:30pm on the Saturday closest to the date of First Quarter Moon (about 7 days old.)

When the moon is near its First Quarter, the terminator (the line dividing light from dark) is favorable for viewing sunlight or shadow on the sides of craters. This time is also good for observing the dark side of the moon occult (cover) stars in the sky beyond it as it moves in its orbit.

The continuing schedule for “Quarter-Moon Saturday Star Parties” follows. All events begin at the Dome at 7:30pm on the following evenings and end at 9:30pm: *Public always welcome.*

Saturday	March 12 <sup>th</sup>
Saturday	April 9 <sup>th</sup>
Saturday	May 14 <sup>th</sup>

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**FOR MEMBERS ONLY:**

**“New-Moon-Saturday” Work Sessions at the Schmidt Continue:**

Starting time is always 7:30pm:

Saturday	March 5 <sup>th</sup>
Saturday	April 2nd
Saturday	May 7th

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These meetings, held each month on the Saturday closest to the New Moon, provide a regular opportunity for CCAS members to work on projects at the Dome and/or to become better acquainted with our equipment and more involved with Dome activities and operations including maintenance. If you are a CCAS Member, and not yet involved at the

observatory, this is your opportunity to join in, have fun, share stargazing, learn about observing and using our equipment with the Observatory Staff.

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](mailto:Joelburnett@comcast.net) 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. Contact [info@ccas.ws](mailto:info@ccas.ws) if you wish to borrow one.

**March Observing:**

**Observing Resources:**

Please see resources in the March issue of *Astronomy Magazine*, pp 36-43, and *Sky and Telescope*, pp 51-59, and Reference 5 for good guides to the sky. See *AM*, p41, *S&T*, pp 48-51 and reference 6 for positions of the moons of Jupiter and Saturn and special phenomena of the moons of Jupiter this month.

**Highlights in the Night Sky for March:**

**Jupiter’s and its Moons Perform This Month:**

As noted in our front page feature, there will be a special opportunity to observe two of the moons of Jupiter *and* their shadows cross the planet in prime time on March 14<sup>th</sup>.

It turns out Jupiter and its moons are prime performers all of March and later into the spring:

- Jupiter is at opposition on March 8<sup>th</sup>. At opposition, the earth is *between* Jupiter and the sun; Jupiter rises as the sun sets, and is closer to the earth than at any other date. Thus it appears as large as it will appear this year (44” in diameter) and it as bright (mag -2.5) as we will see it.
- Because we are now between Jupiter and the sun, the sun being “behind us” causes moons transiting Jupiter to often appear with their shadows not far from each moon during transit.
- For the same reason, there will be *many* occasions to view the moons and their shadows cross the planet this month.. We have mentioned the night of March 14. Another similar event, while later at night than the event on the 14<sup>th</sup>, will take place beginning after midnight on the night of March 21-22.
- Please read the articles in the March issue of *Astronomy* magazine, pp. 36-37, 41, and *S&T*

pp.46, 48-51 and see our Reference 6 for more information on viewing phenomena of the moons of Jupiter during March.

The **Vernal Equinox** occurs at 12:30am on Sunday, March 20<sup>th</sup>. At this time, the sun is about halfway from its southernmost (which takes place at the winter solstice) to its northernmost (which takes place at summer solstice). The hours of daylight very nearly equal the hours of night at all places on the earth at the two equinoxes (“equal night”) each year.

**Daylight Savings Time** begins at 2am on Sunday, March 13, for the United States and most of Canada.

<b>Mooncusser’s Almanac and Monthly Alert<sup>1</sup></b>			
<b>MARCH 2016</b>			
<b>Object</b>	<b>March 1 (EST)</b>	<b>March 15 (EDT)</b>	<b>March 29 (EDT)</b>
<b>Sun</b>	R 06:14 S: 17:31	06:51 18:47	06:23 19:05
<b>Moon</b>	R: 00:36 S: 10:35	11:44 02:03	02:00 11:51
<b>Mercury (in the sun)</b>	R: 05:42 S: 15:56	06:44 18:05	06:44 19:46
<b>Venus (predawn)</b>	R: 05:15 S: 15:21	06:07 16:55	05:52 17:32
<b>Mars (late nite)</b>	R: 23:51 S: 09:40	00:21 10:01	23:39 09:10
<b>Jupiter (all nite)</b>	R: 17:59 S: 06:46	17:55 06:47	16:42 05:39
<b>Saturn (late nite)</b>	R: 01:15 S: 10:44	01:22 10:51	00:19 09:48
<b>Uranus (evening)</b>	R: 07:41 S: 20:36	07:48 20:45	06:47 19:46
<b>Neptune (in the sun)</b>	R: 06:14 S: 17:18	06:20 17:26	05:18 16:26
<b>Pluto (predawn)</b>	R: 03:28 S: 12:58	03:34 13:04	02:32 12:02

**Minima of Algol<sup>1,3</sup>, March:**

Algol, a variable double star in Perseus, shines normally at mag 2.1 but once every 2.87 days dims to mag 3.4. The dimming is caused by the dimmer of two self-orbiting stars eclipsing the brighter as viewed from earth.

There is one convenient evening occurrences of the Minima of Algol this month: Saturday, March 12<sup>th</sup>, at 10:25pm.

[Please note: a **Star Party, open to the public, is scheduled for that night at the Schmidt Observatory.**

Using binoculars or a small telescope, try to begin viewing two to three hours before the minima to watch the dimming (record magnitudes now and then by comparing Algol with

neighboring constant magnitudes) and up to two to three hours after the minima to watch the brightening.

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**Declination Tables for the Moon**<sup>2</sup> during this month.  
Please contact your editor for information or sources.

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**NOTICE: NEW COPIES OF THE  
BROCHURE INTRODUCING CCAS  
AND ITS ACTIVITIES ARE  
AVAILABLE; INQUIRE AT  
[info@ccas.ws](mailto:info@ccas.ws) IF YOU WISH COPIES.**

**Moon Phases, March, 2016**

**Last QTR**, Tuesday, March 1<sup>st</sup>, at 6:11pm EST

**New Moon**, Tuesday, March 8<sup>th</sup>, at 8:54pm EST

**First QTR**, Tuesday, March 15<sup>th</sup>, at 1:03pm EDT

**Full Moon**, Wednesday, March 23<sup>rd</sup>, at 8:01am EDT

**Last QTR**, Thursday, March 31<sup>st</sup>, at 11:17am EDT

## **Cape Cod Astronomical Society**

President	Michael G. Hunter	5083643370(cell)
Vice President	Ed Swiniarski	5088965973
Secretary	Gus Romano	7819294770
Treasurer	Peter Kurtz	5082550415
Observatory Director	Joel Burnett	5082217380
<i>First Light</i> Editor	Peter Kurtz	5082550415

Mailing Address: A. P. Kurtz, CCAS Treasurer, 34 Ridgewood Rd,  
Orleans MA 02653

## **Cape Cod Astronomical Foundation**

Chairman Emeritus	Werner Schmidt	5083629301
Chairman	Mike Hunter	5083859846
Vice Chairman	Ed Swiniarski	5088965973
Director of R&D	Bernie Young	5083941960
Secretary	Joel Burnett	5082217380
Treasurer	Gus Romano	7819294770
Observatory Director	Joel Burnett	5082217380
Observatory Phone Line		5083984765

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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 K12 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 January 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. S&T's reliable calculator for Minima of Algol dates and times can be found at: <http://www.skyandtelescope.com/observing/celestial-objects-to-watch/the-minima-of-algol/>
- 5) Here is the web address for Astronomy Magazine's "The Sky This Month" online for March: <http://www.astronomy.com/magazine/sky-this-month/2016/01/jupiter-dazzles-all-night>
- 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) URL for David Eicher's Essay:  
[http://www.astronomy.com/bonus/pseudo?utm\\_source=SilverpopMailing&utm\\_medium=email&utm\\_campaign=ASY\\_News\\_Sub\\_160205\\_Final+remainder&utm\\_content=&spMailingID=24659256&spUserID=MTE2MjkyMDE5MzMyS0&spJobID=741050037&spReportId=NzQxMDUwMDM3S0#.VrZJO5CfZWg.email](http://www.astronomy.com/bonus/pseudo?utm_source=SilverpopMailing&utm_medium=email&utm_campaign=ASY_News_Sub_160205_Final+remainder&utm_content=&spMailingID=24659256&spUserID=MTE2MjkyMDE5MzMyS0&spJobID=741050037&spReportId=NzQxMDUwMDM3S0#.VrZJO5CfZWg.email)