



# *First Light*

The Newsletter of the Cape Cod Astronomical Society

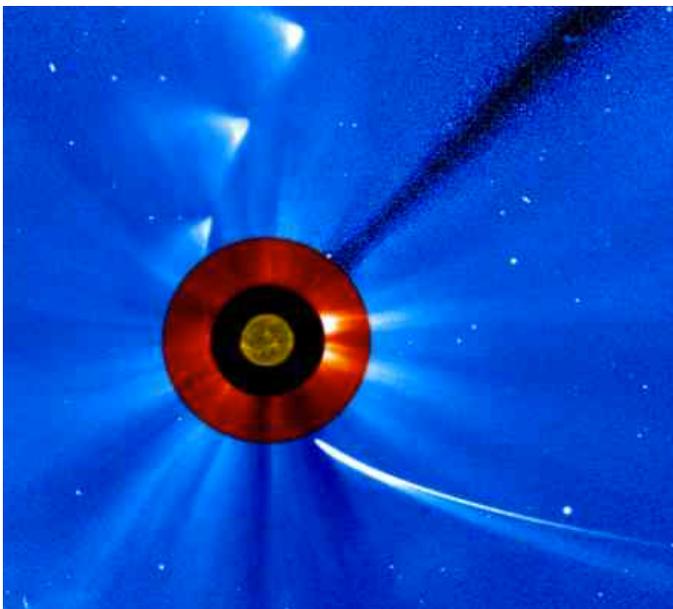


January, 2014

Vol. 25 No. 1

## Whither Comet Ison?

NOW WE KNOW.....



### Superimposed Images of Comet ISON Rounding the Sun on Nov. 28, 2013.

NASA took a series of images to create this "timelapse" view of comet ISON's trip around the sun. Comet ISON entered the field of view of the European Space Agency/NASA Solar and Heliospheric Observatory (SOHO.) In this picture, called a coronagraph, the bright light of the sun itself is blocked so the structures around it are visible. The picture shows that ISON disintegrated while rounding the sun and, for all practical purposes, is no more. Please see the story on page 4 including a very wistful NASA eulogy to learn more.

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**Merry Christmas! Happy Hanukkah! Happy New Year!**

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**Next Monthly Meeting:** is Thursday, January 9th, at 7:30pm: Warren Mumford, recently joined CCAS member and experienced amateur astronomer and educator, will present **A Bit about Orbital Mechanics** Please note the date: January 9<sup>th</sup>, NOT first Thursday! Public welcome. Please join us.

**Reminder: The 2013 Dues Cycle began July 1. If you have not yet participated, please bring your check to the February meeting or mail to CCAS, 34 Ridgewood Rd. Orleans MA 02653. Thanks to all who are paid up!**

**Reminder:** The next once-a-month "Quarter-Moon-Saturday" Star Party takes place on January 11<sup>th</sup> at 7:30pm.

**In this issue:** / ISON's demise / Upcoming meetings and topics / Jupiter (47<sup>th</sup>) at blazing opposition on January 5<sup>th</sup> / Mercury at its best late in month / Quadrantids peak with no moon on January 3<sup>rd</sup> /

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## **Bright New Stars:**

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

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

### **CCAS Meetings:**

Many thanks to Bernie Young and Mike Hunter for their most informative presentation at our December meeting: **“Astrophotography: Move It or Keep It Still,”** ... an overview of still and video digital astrophotography for beginners. Mike surveyed key recommendations for taking and processing images using a Canon SLR camera attached at prime focus to a telescope. He presented some spectacular photos and key do’s and don’ts. Bernie overviewed the world of video cameras used with telescopes and the pros and cons of cameras ranging from a dime-store Toucan all the way up through the best SBIG has to offer causing thousands of dollars each.

**January Meeting:** Warren Mumford, recently joined CCAS member and experienced amateur astronomer and educator, will present **A Bit about Orbital Mechanics** at our meeting on January 9th. **NOTE the date! (not first Thursday!)**

Warren will introduce us to the elementary (and then some) aspects of Orbital Mechanics, the principles of physics that allow us to understand and predict the motions of all orbiting heavenly bodies. The beginning of this science is Newton's Laws of Motion, something we (should have) all learned in high school physics, but for which a refresher would be most welcome. Newton's relationships and their derivatives have been routinely used by astronomers for many years for diverse purposes: estimating the mass of the sun, identifying black holes, and providing evidence for dark matter.

The staff of our Observatory will conduct an open-house: **“A Visit to the Schmidt- the Werner Schmidt Observatory”** for all CCAS members for our meeting on February 6th. The Schmidt is heated but do wear warm footwear. New capabilities will be highlighted, and, who knows? ... it might even be clear enough to do some observing! Public welcome.

At our March 7 meeting, Peter Kurtz will present **“Highlight Capabilities of the (\$2.99!) Sky Simulation Program and Telescope Control Program ,Sky Safari”**; Mike Hunter will discuss a special aspect of using this powerful app: **“The Use of Sky Safari Pro and SkyFi in the Acquisition and**

**Evaluation of Astrophotographs”**. As always, public welcome.

CCAS members Larry Brookhart, (Harwich Observatory Director), and Gus Romano will present "Harwich Observatory" at our April 4th meeting. Larry has been developing an observatory at the Harwich elementary school (now part of the Monomoy Regional School District) for several years; Larry and Gus will update us on capabilities and activities.

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Thanks to Mike Hunter, our Program Chair, for lining up these special topics and speakers; we also thank Mike, Bernie, Warren, Peter, Larry and Gus for agreeing to present.

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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 or to [info@ccas.ws](mailto:info@ccas.ws) . For sure he will follow up.

We are looking for speakers for our later in 2014. Please let us know if you have any leads...

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

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***Reminder: The 2013 Dues Cycle began July 1. As of now 41 of 61 members (70%) are paid up (does not include 16 active members who are “permanent”, spouses, students, etc.)***

***If you have not yet participated in this cycle, please bring your check to the January meeting or mail to CCAS, 34 Ridgewood Rd. Orleans MA 02653. Thank you.***

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### **Minutes:**

The minutes of our December 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/ccasminutes120513.pdf>

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### **From the Dome:**

The next “Quarter Moon Saturday Star Party takes place at The Schmidt on January 11<sup>th</sup>, at 7:30pm. Future dates are: February 8<sup>th</sup>, March 8<sup>th</sup>, April 5<sup>th</sup>, May 3<sup>rd</sup> and June 7<sup>th</sup>.

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. If you wish to borrow one of these 'scopes, contact [info@ccas.ws](mailto:info@ccas.ws)

### January Observing:

Mooncusser's Almanac and Monthly Alert <sup>1</sup>			
JANUARY 2013			
Object	JAN. 1 (EST)	JAN. 15 (EST)	JAN. 31 (EST)
Sun	R: 07:07 S: 16:21	07:05 16:35	06:53 16:54
Moon	R: 07:06 S: 16:55	16:27 06:34	07:08 18:06
Mercury (evening)	R: 07:26 S: 16:22	07:51 17:24	07:41 18:29
Venus (evening)	R: 07:50 S: 17:43	06:13 16:21	04:47 14:58
Mars (late night)	R: 23:49 S: 11:36	23:22 10:55	22:46 10:06
Jupiter (all night)	R: 16:33 S: 07:35	15:29 06:33	14:17 05:23
Saturn (predawn)	R: 03:03 S: 13:15	02:14 12:23	01:16 11:23
Uranus (evening)	R: 11:14 S: 23:41	10:20 22:47	09:18 21:47
Neptune (early eve)	R: 09:52 S: 20:41	08:58 19:47	07:56 18:47
Pluto (-----)	R: 06:55 S: 16:30	06:02 15:37	05:01 14:37

### Observing Highlights for January:

Please see resources in January's *Astronomy Magazine*, pp 36-43 and *Sky and Telescope*, pp 43-60, and Reference 5 for good guides to the January sky. See p 41 in *Astronomy*, and pp 50-51 in *Sky and Telescope*, and also reference 6 for positions of the moons of Jupiter for January; timings for special phenomena of the moons of Jupiter (shadow transits, occultations, etc.) and timings for "the great Red Spot" of Jupiter can be found on page 51 of *Sky and Telescope*.

**Jupiter and its Moons** star in prime time for the next several months but especially in January: Jupiter is at its largest this year and at opposition on January 5<sup>th</sup>. It blazes at mag -2.7 that night and is 47" in diameter. Also, anytime that evening, you can see *all* the Galilean moons (Io, Europa, Ganymede, and Calisto sitting in an almost perfect line ; the line is almost exact at 11:30pm; only Io moves much during the evening.

As you can see from the table above, all the "outer" planets, especially **Jupiter and its moons** are good telescope targets in evenings during January.

**Mercury** is nicely separated from the sun early evenings in the 2<sup>nd</sup> half of the month: it is already separated 10° from the sun on January 19<sup>th</sup> and separates even more in the following days. End January of this year is possibly the best time to observe Mercury all year. *Try Cape Cod Bay from Rock Harbor at sunset toward the end of January... if the shallows have frozen and the ice is all jumbled up at sunset, you might capture a spectacular scene while /taking pictures of Mercury.*

**Venus** is too close to the sun to be a good observing target in January although if you could see it, it would be a very thin crescent. Try in February.

**Neptune**, and a bit later, **Uranus**, are nicely placed in the southwest evening sky this month. Check the chart on this page to make sure you look early enough to catch Neptune high enough for good viewing.

As can be seen from our chart, you need to stay up late or get up early to view **Mars** or **Saturn**.

Need a prompt to go out in the cold to watch a meteor shower? Try this quote from, young Nate Rulf, a nephew of long-time CCAS member Gary Derman (Thanks, Gary!)"

"When I arrived home at 2:30 am and brought in my bike, something electric in the air called me back outside. There was a magic stillness and the objects of the sky were sizzling bright. I looked down, and a huge spider was walking across the surface of the pool, underlit in jade, skating without disturbing the surface. I looked up, and the biggest brightest shooting star I've ever seen dropped a trail of fire across the sky and ended in a huge silent explosion. I stared up with my mouth open, and became aware the magic moment had ended

January could be *the* month for a good meteor shower this year. The *quadrantids* (radiant a bit east of Bootes in the late night hours) peak predawn out of the east/northeast on Friday, January 3<sup>rd</sup>. The key for this viewing is that there will be *essentially no moon* (new two days earlier.) Up to 120 *quadrantids*/hour might be seen at peak; but don't hesitate to look for strays anytime during off peak from December 28 through January 12<sup>th</sup>.

### Minima of Algol<sup>1,3</sup>, November:

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 are no fewer than FIVE *evening* occurrences of the Minima of Algol at Cape Cod during January: Thursday, January 2<sup>nd</sup>, at 11:35pm; Sunday, January 5<sup>th</sup>, at 8:24pm; Wednesday, January 8<sup>th</sup>, at 5:13pm; Saturday, January 25<sup>th</sup>, at 10:09pm; and Tuesday, January 27<sup>th</sup>, at 6:59pm.

Using binoculars or a small telescope, try to begin viewing two to three hours before the minima to watch the dimming and up to two to three hours after the minima to watch the brightening.

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

### **Moon Phases, January, 2013**

**New Moon** Wednesday, January 1st, at 6:14am EST

**Perigee on same day as New Moon: HIGH TIDES**

**First QTR** Tuesday, January 7<sup>th</sup>, at 10:39pm EST

**Full Moon** Wednesday, January 15<sup>th</sup>, at 11:52pm EST

**Last QTR** Friday, January 24th, at 12:19am EST

**New Moon** Thursday, January 30th, at 4:39pm EST

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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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# Whither Comet Ison?

## NOW WE KNOW.....

**Superimposed Images** of Comet ISON rounding the sun at perihelion are shown on page 1. NASA extracted a series of images from a video to create this "timelapse" view of comet ISON's trip around the sun (reference "a" below). You can see ISON, still essentially fully formed approaching the sun from right to left at bottom and then three images of degassing fragments above the sun travelling up and to the right.

Comet ISON entered the field of view of the European Space Agency/NASA Solar and Heliospheric Observatory (SOHO). In this picture, called a coronagraph, the bright light of the sun itself is blocked so the structures around it are visible. The picture shows that ISON disintegrated while rounding the sun and, for all practical purposes, is no more.

NASA also provides a full video (corresponding to the superimposed images on page 1) of ISON approaching and then (its fragments) leaving the sun (reference b below). Text accompanying that video states, "Whether the spot(s) of light (remaining) were merely a cloud of dust that once was a comet, or if it still had a nucleus -- a small ball of its original, icy material -- intact, is still unclear. It seems likely that as of Dec. 1, there was no nucleus left." The article goes on to say that photos from Hubble will determine if there is anything of a comet left besides fragments and gas.

The article from (reference "a") providing the "time-lapse" photo, also provides the following almost wistful eulogy for ISON. Enjoy it, as we might have enjoyed ISON, had it survived:

Comet ISON, a "shining green candle in the solar wind," is no longer with us, NASA declared Monday morning in a tribute to what many hoped would be the "Comet of the Century."

On NASA's Comet ISON Observing Campaign website, astrophysicist Carl Battams writes that ISON was

- "born 4.5 billion BC, and
- fragmented Nov. 28, 2013 (age 4.5 billion yrs old)."

Then he adds this thoughtful if somewhat imaginative eulogy:

"Born in a dusty and turbulent environment, comet ISON spent its early years being jostled and struck by siblings both large and small. Surviving a particularly violent first few million years, ISON retreated to the Oort Cloud, where it maintained a largely reclusive existence for nearly four billion years. But around 3-million B.C., a chance encounter with a passing star coerced ISON into undertaking a pioneering career as a Sungrazer. On September 21, 2012, ISON made itself known to us, and allowed us to catalog the most extraordinary part of its spectacular vocational calling.

"Never one to follow convention, ISON lived a dynamic and unpredictable life, alternating between periods of quiet reflection and violent outburst. However, its toughened exterior belied a complex and delicate inner working that only now we are just beginning to understand. In late 2013, Comet ISON demonstrated not only its true beauty but a surprising turn of speed as it reached its career defining moment in the inner solar system. Tragically, on November 28, 2013, ISON's tenacious ambition outweighed its ability, and our shining green candle in the solar wind began to burn out.

"Survived by approximately several trillion siblings, Comet ISON leaves behind an unprecedented legacy for astronomers, and the eternal gratitude of an enthralled global audience. In ISON's memory, donations are encouraged to your local astronomy club, observatory or charity that supports STEM and science outreach programs for children."

### Resources:

- a. Web page for the "time-lapse" photo and eulogy: <http://www.npr.org/blogs/thetwo-way/2013/12/03/248202813/comet-ison-is-no-more-nasa-says>
- b. Web page for further information including a video showing how the fragments grow dimmer and dimmer after perihelion with time: <http://www.youtube.com/watch?v=kcROVqmF9SY&feature=youtu.be>

## Cape Cod Astronomical Society

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Vice President	Stanley Rivers	508-945-6126
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Treasurer	Peter Kurtz	508-255-0415
Observatory Director	Joel Burnett	508-221-7380
<i>First Light</i> Editor	Peter Kurtz	508-255-0415

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

## Cape Cod Astronomical Foundation

Chairman	Werner Schmidt	508-362-9301
Vice Chairman	Michael Hunter	508-385-9846
Director of R&D	Bernie Young	508-394-1960
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

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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 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 January2007-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  $\gamma$ -Andromedae to Algol's west, mag 2.1, and  $\epsilon$ -Persei to its east, mag 2.9.

5) Here is the web address for Astronomy Magazine's "The Sky This Month" online for January:

<http://www.astronomy.com/magazine/sky-this-month/2013/11/jupiters-all-night-show>

See also S&T resources online at <http://www.skyandtelescope.com/>

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>

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