



First Light

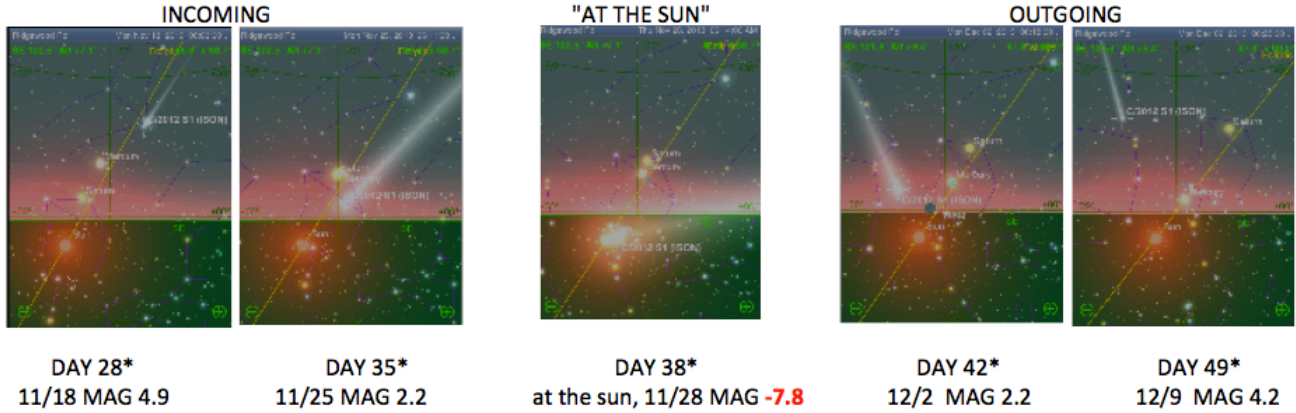
The Newsletter of the Cape Cod Astronomical Society



November, 2013

Vol. 24 No. 11

What can we Really Expect from Comet C/2012 S1 (ISON).....?



* Day numbers above key to tables and images in the story beginning on page 5; in this scheme, Day 38 has ISON at perihelion. Brightness of comet image-to-image are schematic, relative, and expectations.

The five pre-sunrise (red glow below the horizon line is the sun) images above are from SkySafari simulations of the position of Comet ISON in the pre-dawn sky for the period 11/18 thru 12/9. Perihelion will take place at 2pm on Thanksgiving Day, 11/28.

These show that from 11//18 a relatively dim (mag 4.9) ISON brightens considerably to mag 2.2 as it moves toward the sun over seven days; then, accelerating, it reaches perihelion in three days, then speeds back above the horizon in 4 days at which time it may be about mag 2.2 again (greater? less?); seven days later it may have dimmed to mag 4.2.

Is this what we should expect? Please see our feature story beginning on page 5 for much more information on expectations for ISON in November and December.

Next Monthly Meeting: is Thursday, November 7th, at 7:30pm: Bernie Young will present “Ancient Astronomer Ulegh Beg.” This promises to be a special adventure into the earlier history of Astronomy. 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 November meeting or mail to CCAS, 34 Ridgewood Rd. Orleans MA 02653.

Reminder: The next once-a-month “Quarter-Moon-Saturday” Star Party takes place on November 9th at 7:30pm.

In this issue: / Comet ISON / Werner’s 99th / New Member / Busy with Outreach / CCAS Featured on Radio Show / EST / Nova Update / Minima of Algol /

Bright New Stars:

Kudos and congratulations to Werner Schmidt, Founder of our Observatory, on beginning his 100th year of life on September 24, 2004. Thank you Werner, for being one of our Brightest Stars for many, many years!

We are pleased to welcome Kristina Burton of Mashpee to membership in CCAS. Kristina joined at our September meeting. Welcome aboard, Kristina! If you can find the time, please send us a note at info@ccas.ws letting us know a bit about yourself and past experiences and interests in amateur astronomy.

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:

Many Student Visits to the Dome in October and other CCAS Outreach Efforts:

In our previous issue, in a feature article about a September visit of Jim Mitchell's Earth and Space Class to The Schmidt, we previewed many outreach events coming up in October. Indeed, Observatory Staff had a very busy month. Here is a quick recap:

- Orientation to the Dome and sun-viewing for Dr. Julia Sigalovski's D-Y 9th graders. (Bernie, Peter, Gail)



Peter Kurtz introduces NEED students to coming comet.

- Joel and Barbara Burnett and Peter Kurtz conducted an introduction to the night sky for fifth graders from the D-Y school district at the NEED facility in Truro. NEED, the National Energy Educational Project, conducts week-long educational sessions for fifth graders from various school districts at a facility in Truro.

- Evening sessions for Jim Mitchell's Earth and Space Class at the Dome on Oct 8th and 10th. (Bernie and several staff members.)
- At the last minute, Bernie and Julia cancelled an evening observing session scheduled for Friday, Oct 11th because of clouds. That session will be rescheduled.
- Regular "Quarter-Moon-Saturday" public Star Party, Saturday, October 12.

Time for a rest! Congratulations to Bernie and Joel, supporting staff, and teachers for mounting such an effort. Outreach is alive and well at CCAS!

Reminder: The 2013 Dues Cycle began July 1. As of now 37 of 61 members 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 11/7 meeting or mail to CCAS, 34 Ridgewood Rd. Orleans MA 02653.

CCAS Meetings:

Many thanks to all presenters and participants of the "Telescope and Equipment Night at CCAS" at our October meeting. Observatory Staff and others in the Society conducted "hands-on" demonstrations with commentary on the various kinds of telescopes and other equipment used for observing the night sky either at our Observatory or at home. Many members brought equipment from home. A key benefit was the many one-on-one discussions between members who exchanged ideas and opinions on equipment, set ups, and use. This was one of our most animated events.

You may or may not know that a reporter and story writer from Cape and Islands NPR station WCAI, Alicia Orsini, participated in our October meeting. Alicia did extensive interviewing during and after the meeting and during a visit to our Observatory. She also took some great photos. Here are links for both the CCAS meeting photos she took and the audio track (and text) for the resulting radio show:

<http://capeandislands.org/post/photos-cape-cod-astronomical-society>

<http://capeandislands.org/post/why-amateur-astronomers-are-important-and-how-become-one>



Ed Swiniarski with Heather Goldstone at WCAI

The radio show was hosted by Heather Goldstone, aired at 11:27am on Monday, October 7th, and lasted about 45 minutes. During the show Heather chatted both with our own Ed Swiniarski and a representative from the Maria Mitchell Observatory on Nantucket. The theme was “Why Amateur Astronomers are Important and How to Become One” – a great advertisement for our hobby and Society and the CCAS and Nantucket observatories.

Congratulations to all participants in this venture; special thanks to Alecia Orsini for her wonderful setup work.

Always ready to serve, Bernie Young will teach us about the Islamic astronomer of the middle ages, Mīrzā Muhammad Tārāghay bin Shāhrukh, better known as **Ulugh Beg**, at our November meeting. Ulugh Beg was a Timurid ruler as well as an astronomer, mathematician and sultan, who lived and worked at the beginning of the 15th century. In 1424, Ulugh Beg founded the Ulugh Beg Observatory in Samarkand. It was considered by scholars to have been one of the finest observatories in the Islamic world at that time and the largest in Central Asia. Ulugh Beg made important improvements in the “instruments of astronomy” at the time. For sure we can look forward to Bernie highlighting some of these advances. For more information, Bernie or Peter can send you a pdf file of an article on Ulugh Beg that was published recently online in the Journal for Occultational Astronomy, No.2, April-June 2013 (available online only to members of IOTA, the International Occultation and Timing Association; Bernie is a member for CCAS.)

As of this writing, we have not yet scheduled programs for the December or January meetings. Topic and Speaker will be published in next month’s *First Light* and on the website when known.

Thanks to Mike Hunter, President and Program Chair, for lining up these special topics and speakers; we also thank upcoming speakers 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 or to info@ccas.ws. For sure he will follow up.

We are looking for speakers for our meetings in December, and February and May 2014. Please let us know if you have any leads...

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

Minutes:

The minutes of our October meeting are on our website; click on the “Minutes” button at www.ccas.ws or go to <http://www.ccas.ws/minutes/ccasminutes100313.pdf>

From the Dome:

The next “Quarter Moon Saturday Star Party takes place at The Schmidt on November 9th at 7:30pm.

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

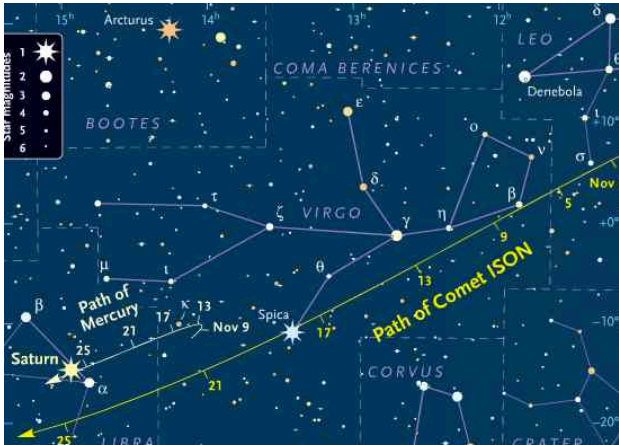
**Our Society exists to promote observing!
Help us promote this objective by asking for time at the Dome!**

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

November Observing:

PLEASE NOTE: DAYLIGHT SAVINGS TIME ENDS at 2am, Sunday, November 3rd. Our clocks are five hours behind UT when we use EST.

The Key Observing Event for November and December is the appearance of **Comet C2012 S1 (ISON.)** Please see page 5 for a feature article on this event and the November Finder Chart from *S&T* (November, p 50) found on the next page.



November Finder Chart for ISON; Nov 1 on right, Nov 25 lower left; Saturn is at lower left, Spica is the bright star in lower center; Mercury is in the picture 11/9-11/25.

Update on Nova Delphinus 2013: We plotted a Light Curve for the nova on 10/23/13 using the AAVSO Light Curve Generator utility online. The decreasing brightness from a maximum of 4.25 on “explosion day + 1”, August 15, is continuing but at a slower and slower rate. Indeed, this one is a “slow” nova. Here are indicator magnitude data (in parentheses) from the 10/23 Light Curve (underlined data is new since last month): 8/16 (4.25), 9/1 (6.6), 9/16 (7.7), 9/26 (8.5), 10/10 (10.5), 10/24 (11.0). The nova is still easily visible with optical aid and now dimming only very slowly; in fact, what was an almost linear slope light curve since August seems to be flattening out over the last few weeks. Will the curve reach some kind of plateau? We will follow up on this again.

Please see resources at *Astronomy Magazine*, November, pp 36-43 and *Sky and Telescope*, November, pp 43-56, and Reference 5 for good guides to the November sky. Please also see the references for Comet ISON in the feature story beginning on page Y.

Minima of Algol^{1,3}, 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.

These are dates and times for *evening* occurrences of the

Minima of Algol at Cape Cod during November: Thursday, 10/31 (10:25pm EDT), Sunday, 11/3 (6:24pm EST), Saturday, 11/23 (8:06pm EST), Tuesday, 11/26 (4:55pm EST; sun sets at 4:12 EST.)

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

Mooncusser’s Almanac and Monthly Alert¹ NOVEMBER 2013

Object	NOV. 1 (EDT)	NOV. 15 (EST)	NOV. 30 (EST)
Sun	R: 07:13 S: 17:35	06:30 16:20	06:47 16:11
Moon	R: 05:22 S: 16:23	15:16 04:51	04:17 14:34
Mercury (predawn)	R: 07:16 S: 17:32	04:48 15:37	05:28 15:26
Venus (evening)	R: 11:23 S: 19:56	10:25 19:02	10:07 19:03
Mars (predawn)	R: 02:08 S: 15:21	00:53 13:45	00:36 13:05
Jupiter (predawn)	R: 21:56 S: 12:52	20:00 10:56	18:57 09:54
Saturn (predawn)	R: 07:30 S: 17:56	05:43 16:05	04:53 15:11
Uranus (evening)	R: 16:17 S: 04:46	14:20 02:48	13:21 01:48
Neptune (evening)	R: 14:52 S: 01:38	12:56 23:42	11:57 22:44
Pluto (evening)	R: 11:48 S: 21:23	09:54 19:29	08:57 18:32

Moon Phases, November, 2013

New Moon Sunday, November 3rd, at 7:50am EST
First QTR Sunday, November 10th, at 12:57am EST
Full Moon Sunday, November 17th, at 10:16am EST
Last QTR Monday, November 25th, at 2:28pm EST

Declination Tables for the Moon² during this month please contact your editor for information or sources.

What can we Really Expect from Comet C/2012 S1 (ISON)?

...by Peter Kurtz

On Monday, October 21st, my wife and I got up very early and, armed with our C8 Celestron 8" telescope and 15x70 binoculars, drove the short distance from our home down to Portanimituc Landing on Pleasant Bay at 4:45am EDT, to see if we could see Comet C/2012 S1 (ISON) ...yet.

Our SkySafari simulator had predicted it to be bright enough to see (mag 9.2) for sure with the telescope. It was predicted to be located nicely in a line from Regulus through Mars just a bit below and left of Mars at azimuth 100° and about 28° above the ocean horizon. A good 8" scope should be able to spot a mag 9 fuzzy in a dark and clear sky. We had a beautiful clear, calm and cool morning. We had Regulus and Mars. And a bit higher, Jupiter and its moons.

But if the comet was there, we couldn't see it. Maybe a blazing 17-day-old moon behind us didn't help much. So we punted to take a good look at Mars and Jupiter and its moons... and then our moon... and went home looking to another day. We knew mag 9 might be on the edge with the moon and an 8". So we'll try again in two weeks: ISON should be mag 7.5 on November 4th.

As I write this on October 23, we are 36 days from when ISON will be at perihelion, racing around the sun. A day or so later it should come back up from its encounter with the sun. During the early days of December it might be bright, very bright, maybe bright enough to see without optical aid. Maybe spectacular. Maybe... "The Comet of the Century"! Those "maybe's" deserve our attention.

But if we are going to get out of bed several mornings before 4am to see it brighten, and to find out what it really will ultimately do, we should first understand as best we can what our expectations should be day-to-day and then make an observing plan.

As of now, most experts feel ISON is *unlikely* to be "The Comet of the Century" as predicted (wished for?) early on. There are now three likely but very different possibilities:

1. It will be a bright naked-eye comet, maybe the best of the century, and even possibly as spectacular as Hale-Bopp or Halley.
2. It will be disappointing: barely visible without optical aid for a only a few days on either side of its trip around the sun.
3. It will disintegrate on approach to the sun (only 1.2 million miles from *sol*) leaving little left to see after perihelion.
4. or.....?

I'm going to bet on possibility #1 or possibility #2. And I intend to follow this phenomenon until we know "the rest of the story." On the chance that some of you readers might have a similar interest, here is additional information from simulations I have done using SkySafari beyond the "tickler" data given on page 1. But first, let's look at resources on ISON and comets in general from astronomy resources published and online.

Here's hoping we'll be celebrating together good viewing of a special astronomical event come the end of December!

Information Resources:

- Check out the special November issue of *Astronomy* magazine "Comet ISON Blazes into Glory". The issue has several articles, clips, and references about ISON, especially the main ISON story beginning on page 54 and also four most informative and entertaining general articles about comets: "The Science of Comets" (p 24), "Comets: From Superstition to Science" (p 30), "Anatomy of a Comet" (p44), and "20 Bright Comets of the Past 50 years" (p46).
- *S&T* has an article on November observing of ISON (p 50) including a finder chart which we presented earlier in *First Light*. *S&T* promises more on ISON for December.
- November's *S&T* also has a very good general article on comets: "How Often do Bright Comets Appear?" (p30).
- Would you like to enter a photo contest for ISON photographers? NSF's Division of Astronomical Sciences, *Discover* magazine, and *Astronomy* magazine are co-sponsoring a "Comet ISON photo contest". See the November issue of *Astronomy*, page 9, for more information.
- ONLINE
 - Periodically check out <http://www.Astronomy.com/ISON> for finder charts, images, observatory news, prediction updates, etc. If you have input to contribute to the site, please send an email to *Astronomy's* Senior Editor at <mailto:mbakich@astronomy.com>.
 - *S&T* also will be maintaining an ISON website at <http://skypub.com/ISON> .

What, When, Where, and How Much:

...Results of further simulations on Comet ISON

The “tickler” data on page 1 showed five images of ISON from SkySafari simulations for the period 11/8 through 12/9; we can see the comet approaching, meeting, and leaving the sun in those images. But more information can help us form an observation plan.

We actually have looked at simulations for a broader period; namely 56 days approximately centered on the day of perihelion, Thanksgiving day, November 28.

Throughout the following portrait, we adhere to the convention that day 0 of our study period is Monday, October 21, the day we first searched for the comet at Portanimituc Landing; perihelion is day 38 (November 28) and the end of our study period is day 56 (December 16th), eight weeks from day 0.

When studying the simulation images shown on page 7, please focus on the position of the comet relative to the sun and the horizon line; in most images, the sun is an hour below the horizon. The brightness of comet images shown image-to-image are schematic, relative, and expectations from the simulator only; magnitude numbers are given in the two tables. How bright the comet will *actually* be day-to-day is not known yet. We will enjoy seeing what really happens!

Please browse the two tables following to discover where the comet should be and how bright it might be for the entire 56 days about perihelion (Table I) and for the “crunch time” nine days as it approaches and then leaves the sun (Table II).

Then make a commitment to get yourself, your binoculars, and/or your telescope down to an eastern horizon before dawn maybe once a week through November 18th, then every few days, and, after perihelion, as often as the performance of the comet merits.

Two cautionary notes:

- Be careful not to stare at the sun; even more importantly, *don't EVER, even for a moment, point your binoculars or your telescope at the sun when it is appearing at the horizon: you can lose your sight and ruin your equipment!*
- Finally, as mentioned earlier in this *First Light*, there is an “old-hat” comet, mag 7 to mag 5 “**2P/Encke**”, in the general vicinity of ISON for the first half of November. So, if you see a comet, take good notes on what, when, where, and how bright, and check later to determine whether it was Encke or an early look at ISON!

...and *DO* enjoy seeing the dance of Saturn and Mercury near the horizon and (higher) Jupiter and its moons those mornings you are out!

Good hunting!

EXPECTATIONS FOR COMET ISON FOR <u>56 DAYS</u> ABOUT PERIHELION							
TABLE I: NINE MONDAYS OCT – DEC AT CAPE COD							
TABLE DAY	MONDAYS DATE	SUNRISE AM EDT OR EST	One Hour before SUNRISE" (EDT OR EST)	ALTITUDE at one hour or (**) 30 mins before SUNRISE	MAGINITUDE Expectation	ISON rises at	NOTE
0	10/21	7:00	6:00	39°	9.2*		
7	10/28	7:07	5:33	38°	8.4		See Note 1
14	11/4	6:16	4:41	35°	7.5		
21	11/11	6:24	4:48	28°	6.3		
28	11/18	6:33	4:36	15°	4.9		very near Spica
35	11/25	6:41		3.5° **	2.2	5:46	
38	Thurs, 11/28	6:44			Very bright	6:44	Perihelion; Note1
42	12/2	6:48	5:09	5° **	2.2	5:49	
49	12/9	6:55	5:15	15°	4.2	4:46	
56	12/16	7:00	5:20	31°	4.9	3:08	

Note 1: Could not see the comet at 63x using an 8” ‘scope in moonlit sky... or... couldn’t find it.

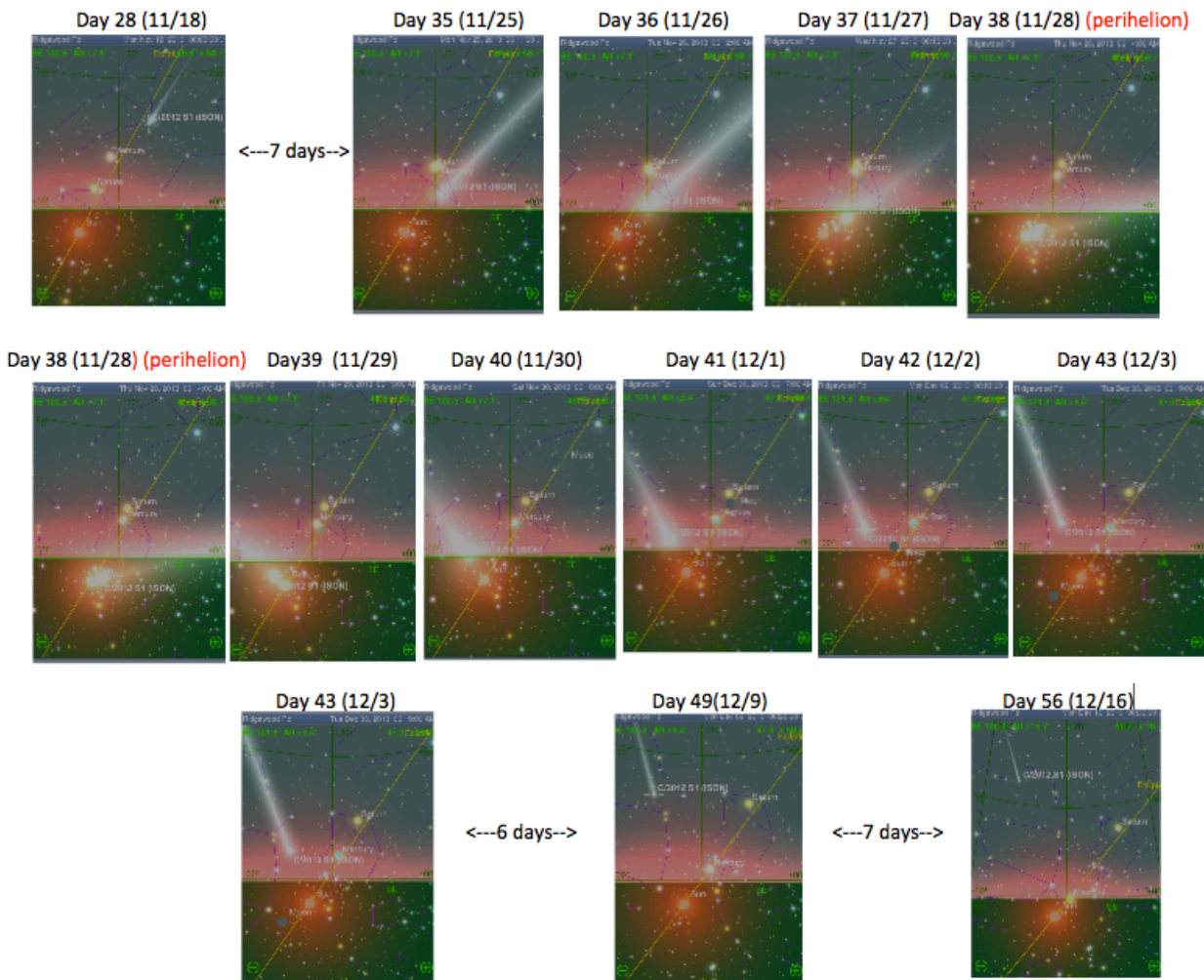
Note 2: Magnitude of ISON at/near perihelion is academic. Simulator says mag -3.8 at sunrise; mag -7.8 at 2pm (perihelion)

EXPECTATIONS FOR COMET ISON FOR 9 DAYS ABOUT PERIHELION

Table II: Details day-to-day **as comet nears and leaves the sun...** at Cape Cod

TABLE DAY	DATE	SUNRISE(EST)	COMET RISE (EST)	MAGNITUDE	COMET Altitude AT SUNRISE
35	Monday, 11/25	6:41	5:46	2.2	8°
36	Tuesday, 11/26	6:42	6:04	1.4	5.5°
37	Wednesday, 11/27	6:43	6:23	0.1	3°
38	Thursday, 11/28	6:44	6:44	-3.2	perihelion
39	Friday, 11/29	6:45	6:33	-1.8	2°
40	Saturday, 11/30	6:46	6:16	0.5	5°
41	Sunday, 12/1	6:47	6:02	1.5	7.5°
42	Monday, 12/2	6:48	5:49	2.2	10°
43	Tuesday, 12/3	6:49	5:37	2.7	12°

Sky Safari Screen Images of the Relative Positions of ISON, the sun, and the horizon for 56 Days About Perihelion
 [The number above each image keys to day numbers in Tables I and II]



Cape Cod Astronomical Society

President	Michael Hunter	508-385-9846
Vice President	Stanley Rivers	508-945-6126
Secretary	Charles Burke	508-394-9128
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

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

5) Here is the web address for Astronomy Magazine's "The Sky This Month" online for November: <http://www.astronomy.com/magazine/sky-this-month/2013/09/ison-at-its-brightest> 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>

Telescope for Sale:

Meade 130-1 ETX90 PE Astro \$350

Dave Graf of 52 Lakewood Drive, Centerville, MA 02632, sent CCAS a note asking if we could publish a notice that he has an ETX-90 for sale. Please contact Mr. Graf directly at (508-775-3289) or at email address goobergraf@yahoo.com if you have any interest in this 'scope.

The telescope is a Premier Edition, UHTC Coatings, and comes with an Autostar Controller. Eyepiece included. It is almost brand new and available in the original box. Purchased in 2007 for \$700.

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!
