



First Light

The Newsletter of the Cape Cod Astronomical Society



February, 2016

Vol. 27 No. 2

When is the Last Time YOU Viewed the Orion Nebula through a telescope?.....



Of all that is natural and accessible to everyone, there is a place where ugliness does not seem to exist, where discord cannot be heard, where the thorns of touch lie well beyond our reach, and no matter where one looks, the face of beauty appears soft and wonderful. I'm referring to a starry sky~~ perhaps the only true face of beauty.

...Stephen James O'Meara⁷

If you haven't done it yet this season, do it at our Star Party, Saturday, Feb. 13.... You'll remind yourself why you got interested in astronomy in the first place!

Our Next Monthly Meeting: is Thursday, February 4th, at 7:30pm in the D-Y High School library. Hugh Blair-Smith will talk to us 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: "*Left Brains for the Right Stuff*": 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 computers important to US space flight.

Reminder: The next "Quarter-Moon-Saturday" Star Party (public welcome) is Saturday, February 13th at 7:30pm. We are also continuing once-a-month "New-Moon-Saturday" "work" evenings for *Staff and CCAS Members only*: February 6th. Please see more information on both these opportunities with schedules on page 3.

In this issue: Two new members / Guide to Stargazing / Telescope Donation / Blue Planets / Jupiter Season / Lineup of FIVE naked-eye planets / Comet Catalina /

Bright New Stars:

We welcome Bruce Bullock of West Yarmouth to membership in CCAS.. Bruce sent us a “write-in” application for membership and dues. We hope to find out more about you, Bruce, as soon as we can... at an upcoming meeting or Star Party.

We also welcome Kegan Berner of Harwich to membership this month. Kegan is an experienced amateur astronomer and astrophotographer having an 8” Meade LX200GPS mounted on a pier, an Orion ED30 3.15” refractor ‘scope, an SBIG CCD camera, and a Canon DSLR. We look forward to sharing information on observing and astrophotography techniques with Kegan.

Welcome aboard, Bruce and Kegan! With Dennis Mascio who joined last month, we have *three* new members this winter!

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).

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

CCAS News Items and Current Events:

New Broad-Ranging “How To” Resource for All Amateur Astronomers :

ALL CCAS members, particularly ***NEW*** members, please check out the review of a new book that will help all of us improve our observing and teaching skills. The February issue of *Sky & Telescope*, p 64, reviews a new book *The Total StarWatcher’s Guide* by Weldon Owen of The Astronomical Society of the Pacific.

If you are new to skygazing, this book will save you hours and hours of frustration learning how to observe “naked-eye”, with binoculars, and getting into telescopes. If you are more experienced, ditto! ...plus find a plethora of techniques valuable to more advanced observers. Please take a look at the review and order the book: it is available for just a bit over \$20 online.

“Astronomy Family” Donates Telescope Systems to CCAF:

This picks up on preliminary information on this donation published last month.

The Boston area family of amateur astronomer Gary Williams, deceased, has donated two telescope systems to the Cape Cod Astronomical Foundation:

- a Celestron CG 9.25” Schmidt-Cassegrain Optical Tube mounted on a “C9” equatorial mount manufactured by Losmandy for Celestron in the late 90’s,

- and a Meade ETX-90, also late 90’s vintage, a 3.5” Maksutov-Cassegrain alt-az ‘scope mounted on a heavy duty Bogen Manfrotto tripod capable of allowing the ‘scope, which can track, to be operated in equatorial mode.

Included is an excellent collection of accessories including eyepieces, filters, a CCD camera, and a “Deep Space Navigator” optical encoder system which should make the Celestron “Go-To”-capable with the purchase of just a bit of modern software.

Your editor picked up these telescopes and related equipment from Gary Williams’ son Peter, in Newton, MA on January 16th. Peter is a postdoc at the Harvard-Smithsonian Center for Astrophysics.

The collection is at Peter’s home and he will be working on inventorying the equipment and checking out the operation of the telescope systems. When the picture becomes clearer on capabilities, we will consult with CCAF on which equipment might be dedicated to use at our Schmidt Observatory, loaned to local student programs, or dedicated to other uses serving the CCAF/CCAS mission.

Many thanks to Peter Williams for his excellent organization of all this material (including operator manuals,) and for working with us to move it. Thanks also to Rosalind Williams, Gary’s wife, for supporting this donation.

CCAS Meetings:

Many thanks to CCAS member, WHOI physicist, and amateur astronomer Jim Lynch for his tutorial on **The Big Bang ...In the beginning** at our meeting on January 7th. Please see the excellent overview of this talk put together by member Gail Smith, filling in for our Secretary, Gus Romano, in the minutes of the meeting (web address is given just below.) Please see Reference 8 for a list of references Jim Lynch sent us on his topic.

We are pleased to announce that Cape Cod’s Hugh Blair-Smith will speak at our meeting on Thursday, February 4th. Hugh will talk to us 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, “**Left Brains for the Right Stuff**”, 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 computers important to US space flight.

A graduate of Harvard, Hugh joined the engineering staff of MIT’s Instrumentation Laboratory about the time the space race was beginning. At that time, the lab was devoted to developing self-contained inertial navigation capabilities for missiles, aircraft, and spacecraft. Hugh found himself with a ground-floor spot with the development of the Apollo Program’s Primary Guidance Navigation and Control system, where he became the software specialist on the Apollo Guidance Computer design team, and the computer

hardware specialist on the AGC programming team. Later, halfway through a 22-year career at MIT, he refocused on fault tolerance logic for the Space Shuttle's onboard computer system. After retiring to Cape Cod, Hugh worked a one-year contract with NASA on reliability software for an instrument in the Lunar Reconnaissance Orbiter, thereby "placing thousands of his own binary ones and zeros in orbit around the Moon".

Looking ahead, we are very pleased to announce that **Professor Larry Marschall** of Gettysburg College, astronomer, teacher and always an excellent speaker, will speak to us on **Comets' Tails - an Update on the Rosetta Mission** at our meeting on March 3rd. More information, when available.

Joel Burnett, Director of our Schmidt Observatory will present "**The State of the Observatory**" at the CCAS meeting on Thursday, April 7th.

Bernie Young, Director of Research at the Schmidt Observatory will discuss "**The Transit of Mercury**" at the CCAS meeting on Thursday May 5th.

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).

Mike Hunter, CCAS President, is our Program Chairman. Please contact Mike or info@ccas.ws if you have any leads on speakers for February or April 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!

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.

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.

Minutes:

The minutes of the January meeting are on our website; click on the "Minutes" button at www.ccas.ws or click here <http://www.ccas.ws/minutes/ccasminutes010716.pdf>

From the Dome:

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 and we'll pass your interest along.

"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	February 13 th
Saturday	March 12 th
Saturday	April 9 th
Saturday	May 14 th

FOR MEMBERS ONLY:

“New-Moon-Saturday” Work Sessions at the Schmidt

Continue:

Starting time is always 7:30pm:

Saturday	February 6 th
Saturday	March 5 th
Saturday	April 2nd
Saturday	May 7th

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 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. Contact info@ccas.ws if you wish to borrow one.

February Observing:

Observing Resources:

Please see resources in the January issue of *Astronomy Magazine*, pp 36-43, and *Sky and Telescope*, pp 37-55 and Reference 5 for good guides to the sky. See *AM*, p46, *S&T*, pp 46-47 and reference 6 for positions of the moons of Jupiter and Saturn and special phenomena of the moons of Jupiter this month.

Please see the note on page 2 of this *First Light* on a new book for observers of the night sky, *The Total StarWatcher’s Guide* published 2015 by The Astronomical Society of the Pacific.

Highlights in the Night Sky for February:

- The annual **Jupiter** show in Prime Time starring the **Galilean Moons** begins this month. Jupiter rises on February 1st at 8:10pm EST.
- **Blue Planets:** **Neptune** is really too low for good telescope observing this month (sets a bit after 7pm on February 1st and *before* sunset on the 29th); you can try early in the month for mag 5.9 **Uranus** before its

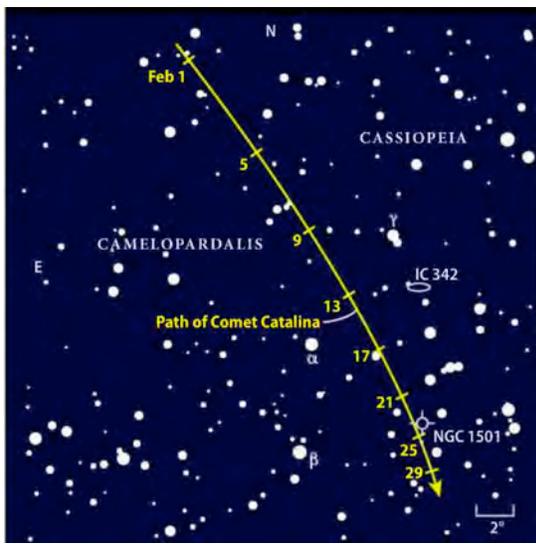
evening season ends (the planet is at altitude 15° at 9pm on February 1st.)

- **Go out to an unobstructed sky with a clear view to the eastern horizon at 5:30am on February 1st and days immediately following** to view, west to east, over 120° of arc, **ALL** of naked-eye-visible **Jupiter, Mars, Saturn, Venus, and Mercury** lined up in the sky.

Rise times on February 1st are as follows: Jupiter, 8:13pm, (31st.) Mars, 00:39, Saturn, 03:02, Venus, 05:04, and finally, little Mercury, 05:24, all well before sunrise (06:53). A thin waning **crescent moon** joins the show predawn on February 6th forming an equilateral triangle, about 3° on a side, with Venus and Mercury

Mooncusser’s Almanac and Monthly Alert ¹			
FEBRUARY 2016			
Object	Feb 1 (EST)	Feb 15 (EST)	Feb 29 (EST)
Sun	R: 06:53 S: 16:55	06:36 17:13	06:15 17:30
Moon	R: 00:49 S: 11:15	11:06 01:05	23:37 09:52
Mercury S	R: 05:24 S: 14:56	05:31 15:06	05:41 15:51
Venus (predawn)	R: 05:04 S: 14:21	05:15 14:47	05:16 15:19
Mars (predawn)	R: 00:39 S: 10:57	00:18 10:21	23:53 09:43
Jupiter (all nite)	R: 20:10 S: 08:47	19:08 07:50	18:04 06:51
Saturn (predawn)	R: 03:02 S: 12:32	02:11 11:40	01:19 10:48
Uranus (evening)	R: 09:33 S: 22:25	08:39 21:32	07:46 20:40
Neptune (early evening)	R: 08:06 S: 19:07	07:12 18:15	06:18 17:22
Pluto (in the sun)	R: 05:19 S: 14:49	04:26 13:55	03:32 13:02

- **Mag 6 Comet Catalina (C/2013 US10)** is worth following this month because it is easily findable all month in a relatively star-free wide field moving about 1° toward the south each day away from Polaris through Camelopardalis. Because bright stars are few and far between in this area, scanning with binocular will find the fuzzball fairly easily. Enjoy how it moves each day. Please see a larger version of the finder chart shown on the previous page in the February *Astronomy*, p42.



There are three convenient evening occurrences of the Minima of Algol this month: Monday, February 1st, at 5:54pm, Thursday, February 18th, at 10:50pm, and Sunday, February 21st, at 7:39pm.

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.

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

Moon Phases, February, 2016

Last QTR, Sunday, January 31st, at 10:29pm EST
New Moon, Monday, February 8th, at 9:39am EST
First QTR, Monday, February 15th, at 2:46am EST
Full Moon, Monday, February 22nd, at 1:209pm EST

Minima of Algol^{1,3}, February:

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.

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

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Observatory Director	Joel Burnett	5082217380
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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.

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 γ Andromedae to Algol's west, mag 2.1, and ϵ 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 February: <http://www.astronomy.com/magazine/sky-this-month/2015/12/morning-sky-delights>
- 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) *Astronomy Magazine*, February issue, "The Face of Beauty", p22.
- 8) References from Jim Lynch's January 7th Presentation "The Big Bang ... in the Beginning":
 - "The inflationary universe", Alan Guth. This is the primary reference for this talk, augmented by Wikipedia articles. This is an excellent, highly recommended book.
 - "Lecture series 2009-10 – "Inflationary cosmology: is our universe part of a multiverse", Alan Guth. An excellent internet reference.
 - "Modern cosmology", Scott Dodelson. A very well written graduate text on Cosmology. Not for the faint of heart. Best book for an advanced course.
 - "The primordial density perturbation", David Lyth and Andrew Liddle. Nice upper level graduate text on cosmology and inflation.
 - "Cosmology", Steven Weinberg. The best monograph around, by a famous Nobel Laureate. Extremely hard core!