



# *First Light*

The Newsletter of the Cape Cod Astronomical Society



December, 2016 Vol. 27 No. 12

*Season's Greetings! Merry Christmas! Happy Hanukkah!*



### *Chris Cook's "Christmas Tree"*

[Comet C/2009 P1(Garradd) in "The Coathanger" asterism (Brocchi's Cluster), September 11, 2011. Please see Ref. 6]

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**Our Next Monthly Meeting is Thursday, December 1st, at 7:30pm in the D-Y High School library.** Bernie Young, Research Director at The Schmidt Observatory, will speak to us on **Apparent Retrograde Motion** in planets.

**Reminder: Monthly "Quarter-Moon-Saturday" Star Parties continue on December 10th, 7:30-9:30pm. Public Welcome.**

**In this issue:** a New Member / Resignation / Winter Solstice / Lunar Eclipse of Aldebaran / The Bear and the Twins / Close Encounter between Mars and Neptune /

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### **Bright New Stars:**

We are pleased to welcome Bob Capstick, and his wife, Elizabeth, to membership in CCAS. The Capsticks live in Newton and, having a second home in Brewster, visit the Cape when time permits.

Bob has a background in Political Science and Physics and has worked for the past 35 years as a consultant in energy and engineering areas with a focus on government and regulatory affairs. Beth has worked as a State Auditor and for the MA State Senate and is currently a consultant for the Massachusetts Coalition for the Prevention of Medical Errors.

Bob has a long-standing interest in astronomy; both look to increase their involvement in things astro as they move toward retirement. Bob looks at Saturn and Jupiter now and then through their Orion Astro View EZ telescope.

They hope to get to their first CCAS Star Party after New Year's.

Welcome aboard, Bob and Elizabeth!

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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Thanks to Chris Cook, Cape Cod Astrophotographer par excellence, for his wonderful "Season's Greetings" photo taken some six years ago; please see Reference 6 for details.

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

#### **Resignation:**

Effective immediately, Peter Kurtz has resigned from his position of Treasurer of CCAS and member of the Executive Board. He is also taking an indefinite leave of absence from the Society.

A precipitating reason for these steps is Peter's feeling that his views on directions for long range planning in the areas of the newsletter and the website were not being given due consideration by the rest of the Executive Board.

A deeper reason for these steps is simpler: burnout. Peter wishes to devote the hours and days he has been preoccupied with in his many and various CCAS duties each month for nearly a decade to other pursuit.

It is Peter's intent that this be the last issue of *First Light* that he creates. He will assist a successor in taking on this task.

Peter will continue indefinitely to carry out duties in the many areas of Society work that he has been carrying until replacement persons can be identified; to include:

- Field inquiries coming in to [info@ccas.ws](mailto:info@ccas.ws) and forwarding various inquiries/requests to Cape Cod Astronomical Society and Cape Cod Astronomical Foundation members as appropriate,
- Continue helping with work in the acquiring and evaluation and placement of donated telescopes and equipment,
- General communications with Society members and associates... including the monthly emailings to members and "Friends" of CCAS,
- Maintenance and modification of the present CCAS website. Peter will continue maintenance of data in this area until a replacement can be found; especially:
  - movement of new newsletters and minutes into the website each month and creating pointers to the new documents,
  - updating information on speakers and topics for meetings and schedules at the Dome.
- He will also assist when a new person is found to take on these duties in teaching the present mechanics and procedures, and with general advice and tips.

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#### **CCAS Meetings:**

Many thanks to Dr. Chat Hull, Jansky Fellow of the National Radio Astronomy Observatory, for his fascinating talk on **Star Formation Through Radio Eyes** at our meeting on November 3<sup>rd</sup>. More information in the minutes for the meeting; please see link to the minutes below.

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#### **Upcoming Meetings:**

We are pleased to announce that Bernie Young, Research Director at The Schmidt, will speak to us at our meeting on December 1<sup>st</sup> on **Apparent Retrograde Motion**. At certain times of year and with certain planets, apparent retrograde motion is an interesting phenomenon we can enjoy observing over many days and sharing with others. We will discuss how to predict these opportunities from a planetarium or sky simulation app or a planetary ephemeris. Not all retrograde motion planet trajectories look alike, and factors affecting the type of trajectory will be explained. For those inclined to do the math, there is an easy way to generate quantitative information on a planet's trajectory. Some hints will be offered for those who want to document a retrograde trajectory using astrophotography.

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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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Jim Lynch, CCAS President, assisted by Mike Hunter, Vice-President, is our present Program Chairman. Please contact Jim or Mike or [info@ccas.ws](mailto:info@ccas.ws) if you have any leads on speakers for January and beyond. We are especially looking for speakers from the CCAS membership.

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!**

**CCAS Dues:**

The 2016-2017 dues cycle began on *July 7<sup>th</sup>*. Dues for most folks are \$30/year. If you have not yet paid, please do so this month if possible, even if you have been accustomed to making payment at other times of the year.

We need this money to pay our bills, pursue outreach, and support our Observatory! *Annual Dues payment is part of membership!* Please bring your check to the meeting or mail right away to: CCAS, 34 Ridgewood Rd. Orleans MA 02653. We will keep the Ridgewood Rd. address until a new Treasurer is named. Peter will forward to Mike for now. Thank you.

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.

The minutes of the November meeting are on our website; click on the “Minutes” button at [www.ccas.ws](http://www.ccas.ws) or click on this link:  
<http://www.ccas.ws/minutes/ccasminutes110316.pdf>

**From the Dome:**

**The “off-season” Schedule of once-per-month “Quarter-Moon-Saturday” Star Parties Continues Saturday, December 10th at 7:30pm at The Schmidt Observatory; Public Welcome.**

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 on the Saturday closest to the date of First Quarter Moon (about 7 days old); start time: 7:30pm End Time: 9:30pm.  
 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. *Public always welcome.*

Saturday	December 10th
Saturday	January 7th
Saturday	February 4th
Saturday	March 4th
Saturday	April 1st
Saturday	May 6th
Saturday	June 3 <sup>rd</sup>

**December Observing:**

**Observing Resources:**

Please see resources in the December issue of *Astronomy Magazine*, pp 36-43, and *Sky and Telescope*, pp 41-56 for good guides to the sky.

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

<b>Mooncusser’s Almanac and Monthly Alert<sup>1</sup></b>			
<b>DECEMBER 2016</b>			
<b>Object</b>	<b>DEC 1 (EST)</b>	<b>DEC 15 (EST)</b>	<b>DEC 31 (EST)</b>
<b>Sun</b>	R 06:49 S: 16:11	07:01 16:11	07:07 16:20
<b>Moon</b>	R: 08:26 S: 18:06	18:09 08:28	08:39 18:43
<b>Mercury</b> <i>(dusk, then sun)</i>	R: 08:27 S: 17:12	08:31 17:34	06:26 16:00
<b>Venus</b> <i>(evening)</i>	R: 10:06 S: 19:10	10:02 19:39	09:44 20:11
<b>Mars</b> <i>(evening)</i>	R: 11:45 S: 21:15	10:46 21:15	10:11 21:15
<b>Jupiter</b> <i>(predawn)</i>	R: 02:17 S: 13:44	01:33 12:54	00:40 11:56
<b>Saturn</b> <i>(end eve season)</i>	R: 07:22 S: 16:46	06:34 15:57	05:40 15:01
<b>Uranus</b> <i>(most of nite)</i>	R: 13:44 S: 02:45	12:48 01:49	11:45 00:45
<b>Neptune</b> <i>(evening)</i>	R 12:09 S 23:13	11:14 22:18	10:12 21:17
<b>Pluto</b> <i>(early eve)</i>	R: 09:22 S: 18:47	08:29 17:54	07:28 16:54

- **The Winter Solstice** takes place at 5:44am, Wednesday, December 21. This marks the longest night of the year: 14.9 hours long. Cheer up: the days begin to get longer starting December 22!
- **Lunar Occultation of Bright Star Aldebaran:** The good news: the thin leading dark edge of the nearly full moon will snuff out bright star Aldebaran at 11:19pm on the night of Monday, December 12<sup>th</sup>. The star will reappear from behind the bright edge of the moon at about 35 minutes after midnight. The bad news: 4.8 *hours* short of being totally full, the moon will be so bright that it will be hard to see the exact disappearance or reappearance events.
- **Will the Bear beat the Twins?** Nearly everyone alive knows the Cubs beat the Indians for the World Series just recently. But “Will the Bear Beat the Twins”? We’re talking meteor showers here. Everyone expects the Geminid Meteor Shower to be often the most spectacular meteor shower of the year. But this year, the Geminid shower, apparently radiating from the constellation Gemini, the Twins, peaks the night of December 12-13, the day before the fullest of full moons. Expect pretty much a washout... only the brightest meteors should be visible.  
But wait! A usually much lesser meteor shower, the Ursids, apparently radiating from Ursa Major, the Bear, peaks at 4am EST on December 22. What moon there is will not be much of a factor (waning crescent, 30% lit, rises about 1am.) If you look *before* moonrise the moon will be a NON factor.)  
Generally the count of significant meteors in the Ursids takes place six hours either side of peak... who knows, this year, the Bear might be the best December meteor shower!
- **Neptune and Mars "Nearly Collide!"** For obvious reasons, it’s not likely that Joel or Bernie will open The Schmidt Observatory on New Year’s Eve.  
But if they do, or if you have a good telescope, you won’t want to miss a very close visual encounter of these two planets.  
On the 31<sup>st</sup>, the separation will be about *one tenth of one degree!*; the night before, close to 1°; the night after, the separation will be about 0.5°. One little problem: Mars sets at 9:14pm on the 31<sup>st</sup> so the two planets will be quite low in the sky: Mars’ altitude at 5:20pm, an hour after sunset will be 35°; at 7:30pm, 18°, at 8:30: 7° off the horizon.

- **Moon Phases, December, 2016**
- **First QTR**, Wednesday, December 7<sup>th</sup>, at 4:03am
- **Full Moon**, Tuesday, December 13<sup>th</sup>, at 7:06pm
- **Last QTR**, Tuesday, December 20<sup>th</sup>, at 8:56pm
- **New Moon**, Thursday, December 29<sup>th</sup>, at 1:53am

- **Minima of Algol<sup>1,3</sup>, December:**
- 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 two convenient evening occurrence of the Minima of Algol this month: Sunday, December 18<sup>th</sup>, at 10:46pm, and Wednesday, December 21<sup>st</sup>, at 7:35pm
- 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 magnitude stars) and up to two to three hours after the minima to watch the brightening.

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**[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 FOR DISTRIBUTION.](#)**

## Cape Cod Astronomical Society

President	Jim Lynch*	5083646192(cell)
Vice President	Mike Hunter	5083643370(cell)
Secretary	Gus Romano	7819294770
Treasurer	Vacant	

Mike Hunter is serving as Acting Treasurer

Observatory Director	Joel Burnett	5082217380
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<i>First Light</i> Editor	Vacant	
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Acting Record Keeper and Webmaster: Peter Kurtz

Mailing Address: CCAS, 34 Ridgewood Rd, Orleans MA

02653.... Online Inquiries email address: [info@CCAS.ws](mailto:info@CCAS.ws)

\* Mike Hunter will assist until Jim retires from WHOI after this year.

## 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), and 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.

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/>

[If you are not a registered user yet of *Sky and Telescope* online, going to this website will result in arriving at a screen asking you to become a registered user. No need to be a subscriber to either the print or online editions of the magazine. For future access to the S&T website, you will be prompted to enter your user ID and password.]

5) 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>

6) "Chris Cook's Christmas Tree" is your editor's name for this beautiful astrophotograph; we trust Chris Cook, the Cape Cod photographer, who took this photo in 2011, will not be offended. Details on the photo: Exposure: RGB = 5:5:5 minutes; Processing: MaxIm DL & Adobe Photoshop CS3; Telescope: Astro-Physics 130mm f6.3 Starfire EDF GT @ f5.2; Mount: Losmandy G11; Guiding: SBIG ST-4 via a Mini-Borg 60 refractor; Camera: SBIG ST-8300M w/FW5-8300 filter wheel; Camera Temp:-20°C; Filters: Astrodon Tru-Balance Gen 2 RGB; Location: Cape Cod Imaging Station - Harwich, Massachusetts; Date: September 2, 2011.