



First Light

The Newsletter of the Cape Cod Astronomical Society



December, 2011

Vol.22 No.12



Comet Garradd C/2009 P1 & Brocchi's Cluster

Chris Cook's "Christmas Tree"

[Comet C/2009 P1(Garradd) in "The Coathanger" asterism (Brocchi's Cluster), September 11, 2011. Please see Ref. 4]

Seasons Greetings! Merry Christmas! Happy Holidays! Happy Hanukkah!

Next Monthly Meeting: is Thursday, December 1st at 7:30pm in the D-Y Library; Past CCAS president Jon Greenberg will present "Galileo vs. The Holy Inquisition: The Trial That Lasted 367 Years" Public welcome. Please join us.

Reminder: "Dark Saturday" Star Party at the Schmidt, 7:30pm, Saturday, December 15th; members and public welcome!

In this issue: Cook's "Christmas Tree" / Dan Burbank on the ISS / New Equipment for the Schmidt / Programs for D-Y Students / Harwich Observatory Opens / December Observing Highlights / Variable Star Observing / Sky Safari 3/

Bright New Stars:

We wish to welcome Ed Gaulin to membership in CCAS. Ed might not see this welcome, however, because while we have his dues check and his home address, not having his email address will prevent us from sending him a notification email about this issue being posted online. If anyone runs into Ed, please welcome him and ask him to please send his email address to info@ccas.ws. Thanks.

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 have new information for us (background, astro equipment of interest, hobbies, etc.) on yourself or someone else, please let us know (email info@ccas.ws).

Thanks to Chris Cook for his wonderful "Season's Greetings" photo.

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

CCAS News Items and Current Events:

Dan Burbank, CCAS Member, Arrives to Command Mission at the ISS

A story in the July issue of *First Light* (http://www.ccas.ws/newsletter/July_2011PDF.pdf) introduced the plans for CCAS' very own astronaut, Dan Burbank, to fly to the International Space Station on a Soyuz in September of this year, and also introduced the fact that Tom Leach had ordered a CCAS shirt and hat to be sent to Dan in time for him to get same on an earlier Soyuz freighter scheduled to get to the ISS in August.

A second story in the October issue of *First Light* (http://www.ccas.ws/newsletter/Oct_2011PDF.pdf) informed us that the August freighter (and the CCAS shirt and hat!) was lost on takeoff of the Soyuz freighter, and, that Dan's own Soyuz flight would be postponed from September to November.



Well we are very pleased to report here that Dan and colleagues *did* arrive safely at the ISS at 2:39am EDT, November 16th, on a Soyuz which left earth on November 14th. Dan will be on the ISS for four months and he will be

Commander of the ISS while there. While we think his CCAS apparel may be lost, Dan promises to wear a *Cape Cod* t-shirt at least some of the time he is in orbit. More details are available in a story that appeared in the *Cape Cod Times* 11/17/11 available on line at: <http://www.capecodonline.com/apps/pbcs.dll/article?AID=/20111117/NEWS/111170323&cid=sitesearch>

The article includes a quote or two from Tom Leach, CCAS President, mentions some aspects of Dan's ties to the Cape, including the fact that he met his wife while on Coast Guard Duty here, and has leading references to earlier articles about Dan and his astronaut career.

Congratulations, Dan, on your successful flight and all best wishes for a smooth ride on the ISS and back! We hope you can come see us when you get back to earth!

See also the news story on the arrival of Dan's Soyuz at the ISS at:

http://www.msnbc.msn.com/id/45307187/ns/technology_and_science-space/#.TtE0UWCjJ-A

and NASA feeds on the mission:

http://www.nasa.gov/mission_pages/station/expeditions/expedition29/exp29_dock.html

CCAS Meeting Nov 3 and Upcoming Meeting Topics

Thanks to professional and now amateur astronomer Harvey Patashnick for his excellent presentation, "**Sea Level Astronomy**" at the CCAS meeting on November 3rd. Patashnick, a physicist by training, with years of professional experience in that field, has also been employed as a professional astronomer. He is actively involved with Dudley Observatory in Albany, New York, and enjoys mentoring students some of whom have been finalists in the Intel Science Talent Search. Harvey's presentation included an excellent and detailed explanation of CCD imaging, a technique that allows amateur astronomers to rival or surpass images taken only a few years ago at professional observatories with conventional imaging techniques. An explanation of "Lucy Richardson" and other techniques was given. For more technical information, see <http://sweaglesw.com/cs448/> and http://en.wikipedia.org/wiki/Meanings_of_minor_planet_names:_21001%E2%80%939322000

Join us at our last meeting of the year on December 1st, when Jon Greenberg, past CCAS President, will present "**Galileo vs. The Holy Inquisition: The Trial That Lasted 367 Years**". Jon's talk will review the sad story of the struggle for a new scientific concept to find acceptance by a culture myopic in its own thousands-of-years' commitment to an alternative concept.

On our meeting on January 5th, Rick Paulus and Julie Guibord will present "**Discovering Planet Earth: Hiking the Pacific Crest Trail**". The Appalachian trail gets much

notoriety in the east. However, a lesser known path brings us much fascinating information about the continent we live on. In 2010, Rick and Julie hiked the entire western ridge of the United States; a months-long trek that took them from Mexico to Canada, 2,652 miles, from desert to mountain top. Come hear about this incredible adventure camping under the stars told by this intrepid husband and wife.

And, once more, thanks to Tom Leach who continues to put together great programs of speakers for our meetings.

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 Tom Leach, our Program Chairman. For sure he will follow up.

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

CCAS Business Meeting: Members Approve Capital Expenditure:

At our meeting on November 3rd, Bernie Young introduced a motion for the membership to endorse Executive Board approval for a \$1000.00 donation to the Cape Cod Astronomical Foundation for the purchase of capital items for the Schmidt Observatory.

The motion was voted on and approved by the CCAS membership.

Information will be provided in future issues of First Light as these capital improvements are accomplished.

Observatory Staff Host D-Y Earth and Space Students at the Schmidt and present an Introduction to Variable Star Observing

Following several months planning with Jim Mitchell, Earth and Space teacher at DY High School, four student outreach events led by members of the Schmidt Observatory Staff took place during November as follows:

- Peter Kurtz and Mike Hunter had provided the class with an introduction to CCAS, amateur astronomy, and the Schmidt Observatory in a brief presentation at the Dome on October 12th; the students had an opportunity to view sunspots under Peter and Mike's tutelage using properly filtered 15x70 binoculars and our Celestron 8" Schmidt-Cass.
- Nighttime student observing sessions were held at the Dome on October 26th, and November 2nd and 9th. The session on October 26th had to be limited to indoor introductions and tutorials because of clouds. A good night of observing took place on the 9th, including catching Jupiter's moon Europa

disappearing behind the planet and an introduction to variable star viewing using binoculars. The session on the 16th enjoyed very active small group discussions in between running upstairs or down to catch the moon or Jupiter here now, here not now between scudding clouds. Many thanks to Mike, Bernie, Joel, Gail, and Ed for supporting these sessions and providing good tutorials.

- On November 9th, Peter presented an Introduction to Variable Star Observing to Jim Mitchell and his Earth and Space Students in a 40-minute classroom session. Main classes of variable stars and examples of variable observing project histories were reviewed. A good collection of resources for planning Student Variable Stars Observing Projects were left with Jim including example sky images, example AAVSO Comparator Star Charts, and AAVSO Light Curves for several specific Variable Star Observing Projects. We hope to work with Jim's students in the near future on one or more of these programs.

Thank you Jim, for the energy and support you gave us in this effort and the opportunity to work with you and your students. We look forward to continued interactions and a reprise either in the spring or next year.

Grand Opening of Harwich Observatory:

The new [Harwich Observatory](#) had its grand opening at the Elementary School on November 16, 2011; check out the article on this event which appeared in the Cape Cod Chronicle, 11/24/11:

<http://www.ccas.ws/observatory%20grand%20opening.html>

CCAS DUES

Thanks to all members who are up-to-date on payment of their 2011-2012 dues. 72% of 46 members are paid up.

If you are one of those who has overlooked the matter, please make your payment either by bringing to the December meeting or mailing directly to CCAS at PO Box 207 Harwich Port MA 02646.

Thank you.

From the Dome...

...by Mike Hunter

Please see earlier story on our Observatory Staff Hosting D-Y students at the Schmidt and related activities.

We will update you as the newly purchased capital items

approved by the Executive Board and the CCAS Membership are implemented. Thank you, members for your support of your Observatory.

“Dark Saturday” Star Parties at The Schmidt; 7:30pm:

Dec 15 Jan 21
Feb 18 Apr 21 Mar24 May 19

As always, “Private” group or individual observing sessions at the Werner Schmidt Observatory may be scheduled by contacting Observatory Director Mike Hunter at mamhunter@yahoo.com 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. Currently, Tom Leach is using the 14” for outreach in Harwich. Robert Tobin has the 8”. If you wish to borrow one of these ‘scopes, contact info@ccas.ws

December Observing:

Observing Highlights for December, 2011 at Cape Cod:

Please consult the December Issues of *Sky and Telescope* (pp 42-49), *Astronomy Magazine* (pp 40-47), and *Astronomy Magazine Online* (See Ref 5) for more information on these highlight topics and others.

This month: Winter solstice, the “other” meteor shower for December, more Jupiter and moons at their best, blue planets, Comet Garradd, and asteroid Eunomia.

The **Winter Solstice** takes place at 12:30am EST, December 22. This “longest night” of the year will give us nearly 15 hours of darkness 12/21 – 12/22; days begin to get longer from this date. There *will* be a spring!

For most observers, December brings hope for a grand display of Geminid meteors in midmonth. This year, because we have an 80% illuminated waning gibbous moon that night, a better night for meteors might be found on December 22/23 and evenings on either side of that date. The **Ursid shower** with radiant in Ursa Minor peaks that night under moonless skies. Try anytime that night or on the 21st or 22nd; you can expect to see possibly 10 meteors per hour under dark skies; in some years, as many as 50.

Planets:

During December, **Jupiter and its moons** continue the wonderful show they have been giving us for several months now; the planet appears still almost as large as it did at opposition in October as earth pulls away only slowly on its inside orbital track.

Resources for Jupiter and its moons: If you don’t have Gas Giants, the iPod/iPad app for moons of Saturn and Jupiter discussed in the April, 2011 *First Light*, please see the December *S&T*, p 47; November’s *Astronomy*, p 41, or the interactive resource online at reference 6 for positions of Jupiter’s moons for any date and time. A chart of special eclipses, occultations, and transits is given in the December *S&T*, p60; a table of transit times for the great red spot in December is given on the same page.

Moonscuser’s Almanac and Monthly Alert¹ **By Peter Kurtz** **December 2011**

Object	Dec. 1 (EST)	Dec. 15 (EST)	Dec. 31 (EST)
Sun	R: 06:48 S: 16:11	07:00 16:11	07:07 16:19
Moon	R: 11:32 S: 22:57	21:26 10:23	10:24 22:45
Mercury (sun, predawn)	R: 07:15 S: 16:33	05:18 15:10	05:34 14:55
Venus (early eve)	R: 09:00 S: 17:56	09:13 18:24	09:13 19:00
Mars (late nite)	R: 23:08 S: 12:26	22:40 11:46	22:04 10:59
Jupiter (evening)	R: 14:15 S: 03:39	13:18 02:40	12:18 01:40
Saturn (predawn)	R: 03:02 S: 14:13	02:13 13:21	01:20 12:25
Uranus (evening)	R: 13:00 S: 01:04	12:05 00:09	11:06 23:11
Neptune (evening)	R: 11:43 S: 22:19	10:49 21:25	09:50 20:28
Pluto (early eve)	R: 08:34 S: 18:16	07:40 17:23	06:44 16:26

Magnitude 5.8 **Uranus** in western Pisces, and mag 7.9 **Neptune**, in Aquarius, are still well placed for observation right after dark in our southwestern sky. See Reference 4a for finder charts. Don’t be late for Neptune; by 7:30pm it is already down to altitude 18° in the Cape Cod sky.

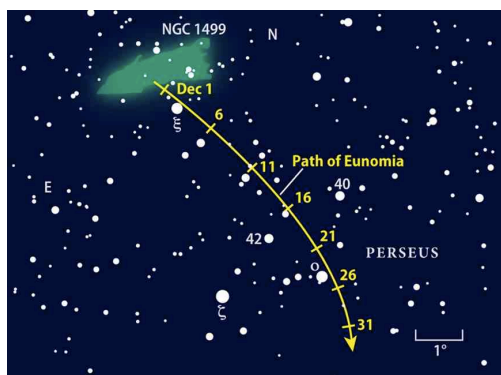
Magnitude 0.5 **Mars** begins its return to the evening sky during December rising only a bit after 11pm on the first of the month and an hour earlier by end month. Viewing is

best later at night when the planet is higher which will take place earlier and earlier as we get into 2012. See if you can see the north polar ice cap; it is pointed toward earth right now. Mars will get larger and larger over the next six months as earth catches up to it on its inside orbital track.

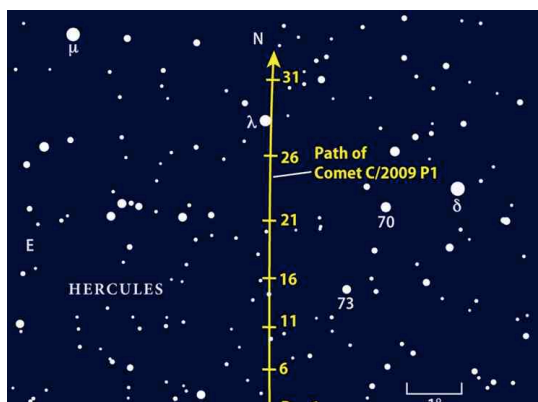
Update on our Newcomer Asteroid and Comet Garradd:

Mag 8.6 asteroid **15 Eunomia** continues to shine high in the eastern evening sky this month between Capella and Jupiter. Don't miss looking for it if you are in Jupiter country or maybe if you're checking out the minima of Algol in Perseus at 10:30pm on the night before Christmas eve.

Here's the finder chart from Reference 5.



As is evident from the following December finder chart, **Comet C/2009 P1 (Garradd)** is picking up steam against its starry background during December. Maybe at the brightest it will get this visit, Garradd should glow around 6th or 7th magnitude this month. The best times to spy its diffuse glow and short tail are under the moonless skies after midmonth.



See reference 8 for more on Garradd and a finder chart tracing it past the Hercules keystone from now until February.

Let's Start Thinking About Viewing Changes in Brightness of Variable Stars!

At our class on Variable Star Observing with the D-Y students on November 9th, we touched on six examples of variable stars that are ripe for observing right now. Here are the three examples from that class, these all "eclipsing variables" (double stars orbiting with each other that now and then find one of the pair eclipsing the other.)

They are:

- The eclipsing variable Epsilon Aurigae in Capella—now slowly brightening after its once every 27 years dimming;
- The eclipsing variable Beta Lyrae, high in the west right now near Vega—watch it dim from mag 3.2 now (11/27) to mag 4.4 on/about December 6th. If you miss that cycle, never fear; it goes back up and back down every 13 days!
- The very rapidly eclipsing variable Algol (Beta-Persei)—dims from 2.1 to 3.3 over about an 8 hour period every 3 days! This month, you can catch it doing this most conveniently in Prime Time on December 30th by observing from about 8:30 pm (about mag 2.3) to 10:30pm (minimum of 3.3) and back to almost 2.3 again by a bit after midnight! And you can do it all without optical aid since the star range is so bright (binoculars will help make it easier to see incremental changes in brightness vs companion stars.)

Don't think a change in brightness from 4.4 to 3.2 is a big deal? That is a change in brightness of a little more than 2.5-fold. If our sun were to brighten 10%, 1/25th of the 4.4 to 3.2 change, the average temperature on earth would be 375° C.! (Chris Berman, December *Astronomy Magazine*, p 12.) So we should be very glad our sun is not a variable star!

Anyone interested in learning how to "do" a variable star observing project, please contact your editor and we will take it from there.

Next month we will deal with examples from another class, "pulsating" variables.

Moon Phases, December, 2011

First QTR Friday, December 2nd, at 4:52am EST

Full Moon Saturday, December 10th, at 9:36am EST

Last QTR Saturday, December 17th, at 7:48pm EST

New Moon Saturday, December 24th, at 1:06pm EST

Anyone having an interest in monthly Libration and Declination Tables for the Moon² or Dates and Times for the Minima of Algol^{1,3} during this month please contact your editor for information or sources.

Resources for Observing: Sky Safari 3

Sky and Telescope magazine has awarded the software/app program Sky Safari 3 a "Hot Product 2012" award. The magazine has also profiled the program in a two page S&T test report in the December issue, page 54.

Readers of First Light and attendees of CCAS Meetings have often recently heard Mike Hunter and/or Peter Kurtz sing the praises of Sky Safari 3, the most excellent pocket or pad night sky simulator and information program which

happens also to be a very good and handy computerized telescope driver program.

Versions are available for your pocket (iPhone, iPod) or iPad (\$14.99) and also Macintosh Computers (\$20 - \$60 depending on version).

This is a program that has all the power of Sky 6, the computer program currently used to drive the 16" Meade telescope in our Dome. But in addition, it provides a very much more intuitive user interface and very good information and graphics image resources for all important sky targets.

Anyone interested in seeing Sky Safari 3 in operation on an iPhone, iPod, iPad, or Mac computer please inquire of Mike or Peter.

Miscellaneous "Optics" and Optical Bench Available:

One Charles Crocker <chase99@comcast.net> sent this email to us at info@ccas.ws:

Is there any do it yourself optical-astronomical work being done these days. I haven't kept up with this field for a long time. I realize that in a very short time period amateur telescope construction has practically disappeared.

I have a collection of lenses, prisms and mirrors that I acquired at the end of WW2, mostly from Edmund Salvage (ed: later became Edmund Scientific) . I don't know if they still exist. Anyway I know I will never get to make anything with them and am looking for someone with more time who could make use of them. I also have a 3 foot optical bench with two carriers.

Anyone having an interest in Charles' goodies or his optical bench, please contact him directly.

**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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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.

4) "Chris' Christmas Tree" is your editor's name for this beautiful astrophotograph; we trust Chris Cook, the photographer, 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.

4a) <http://media.skyandtelescope.com/documents/Uranus-Neptune-2011.pdf>

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

<http://www.astronomy.com/en/News-Observing/Sky%20this%20Month/2011/10/Taking%20a%20dip%20in%20Earths%20shadow.aspx>

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>

7) A profile on Garradd through February: <http://www.skyandtelescope.com/observing/highlights/128836743.html>