



First Light

The Newsletter of the Cape Cod Astronomical Society



January, 2012

Vol.23 No.1

Well, we thought Chris Cook's "Christmas Tree" photo in this slot last month would rate "Best Photo of the Year in First Light. But we may have to give First Prize to this spectacular shot...



...taken by our own astronaut and CCAS member, Dan Burbank, from the ISS on Dec 21, 2011
[Please see p 2 and 5 for more information and the email Dan sent us enclosing the photo...]

A very happy New Year to Members & friends of CCAS!

Next Monthly Meeting: is Thursday, January 5th at 7:30pm in the D-Y Library; Rick Paulus and Julie Guibord will present "**Discovering Planet Earth: Hiking the Pacific Crest Trail**". Public welcome. Please join us.

Reminder: "Dark Saturday" Star Party at the Schmidt, 7:30pm, Saturday, January 21 ; members and public welcome!

In this issue: Lovejoy Comet Photo and Dan Burbank's Email / New Members / Contributions to CCAF / Capital Purchases Accomplished / Quadrantid Meteors / a New Comet

Bright New Stars:

We wish to welcome Lee Labarre to membership in CCAS. Lee is a Systems Engineer with MITRE Corp, consulting on computer networking and network management. He is a former Professor of Computer Science who enjoys kayaking and reading and his Celestron 130LT scope. He is “still trying to figure out” his main interests in amateur astronomy.

We also wish to welcome to membership Lee Bystock and Peter Howes. Lee has been attending CCAS meetings at least since last May. Peter is an optical engineer and presented a wonderful program “Evolution of Large Mirror Telescope Systems at the Haleakala Observatory” to us in April. Peter and Lee, please let us know a bit more about yourselves.

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 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

Dan Burbank’s Email to CCAS and Photo of Comet Lovejoy

Last month we reported that astronaut and CCAS member Dan Burbank safely arrived at the ISS on a Soyuz rocket capsule in November. Just before Christmas, he sent an email (received by *First Light* December 23) to family and friends to which was attached the spectacular photo seen on page 1 of Comet Lovejoy taken from over Australia.

Thank you so much, Dan, for your email and photo. We hope to have you come and speak to us after your return to earth!

Dan’s email is given on page 5.

Here is a bit more information from some stories that showed up on the web on December 23 in addition to what Dan had sent us directly.

From a story announced December 23 in a *Sky and Telescope* email newsletter yielding this url: <http://www.skyandtelescope.com/community/skyblog/observingblog/Comet-Lovejoy-Keeps-on-Giving-136099108.html>

The article included these comments: “Comet Lovejoy Spotted From Space Station. ISS030-E-014350 (21 Dec. 2011) --- Comet Lovejoy is visible near Earth’s horizon in this nighttime image photographed by NASA astronaut Dan Burbank, Expedition 30 commander, onboard the International Space Station on Dec. 21, 2011.”

The S&T story also gave this reference to a “quick flick” version of the photo: (<http://www.flickr.com/photos/nasa2explore/6555113049/>): “Astronaut Dan Burbank captured Comet Lovejoy from the International Space Station on December 21, 2011. Despite setting his Nikon D3S to an ISO of 12800, he still needed a steady hand for this 0.8-second exposure through an f/2.8 lens. *The greenish ribbon, above the blue twilight band hugging Earth’s limb, is airglow from oxygen atoms about 60 miles (100 km) up.*”

Finally, thanks to former CCAS member and frequent correspondent Mike Renzi, who, also on December 23, sent us this reference to another story about Dan and his photo: <http://www.spaceflightnow.com/station/exp30/111222come/t/>

Contributions to Cape Cod Astronomical Foundation:

Your editor sent out an email to CCAS members and “Friends of CCAS” just before Christmas reviewing highlights of events and improvements accomplished at The Schmidt Observatory and suggesting it would be a good idea to support our Dome and its activities with a tax-deductible contribution to the Cape Cod Astronomical Foundation. The response already has been very good. If you would like to join the supporters who have already responded in such a very positive way, please send your check made out to the Foundation to A. Peter Kurtz, 34 Ridgewood Rd., Orleans MA, 02653. Peter will forward to the Foundation. More information on progress in this project will be reported in the future.

CCAS Meeting, December 1st, and Upcoming Meetings January 5th and February 2nd

Thanks to Jon Greenberg for his excellent presentation, **“Galileo vs. The Holy Inquisition: The Trial That Lasted 367 Years”** Jon’s talk reviewed 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.

Subsequent to the meeting, Jon sent this follow-up information in an email to *First Light*: “Last night, Alice and I watched the two hour Nova DVD, **Galileo’s Battle for the Heavens**. It is largely based on Dava Sobel’s book Galileo’s Daughter” and is quite good. In next month’s *First Light* you might suggest that interested members borrow this DVD through CLAMS or Netflix.”

Join us at our first meeting of 2012 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 fascination and discovery about the continent we live on. In 2010, Rick and Julie hiked the entire western ridge of the United States; a trek that took them several months 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!

Capital Purchases for The Schmidt Observatory:

Last month’s *First Light* mentioned approval by the Society to contribute \$1000 toward new equipment for The Schmidt. We are pleased to report that these funds, with others, made acquisition and implementation of the following main items, among others:

- a 40” Flat-screen Hi Def TV which makes possible the following:
 - excellent viewing of feeds from video cameras on the 16” Meade and other scopes such that we now have the capability to show the sky to people who cannot manage climbing up into The Dome
 - the ability to bring Star Party visitors indoors if the weather turns foul and to provide tutoring at “virtual Star Parties” using several planetarium programs on computers or ipads connected directly to the new TV;
 - the ability to play back video recordings of observations taken on different dates; occultation events and movement of comets are good examples.
- a new laptop computer that will be dedicated to bringing full and user-friendly “Go To” capabilities to our big 18” Obsession Dob
- a Meade Lightswitch telescope which automatically aligns itself and will become a key new tool for outreach at public star parties.

We are hoping that equipment, education, and outreach capabilities at The Schmidt can continue in the future with the help of further contributions from Society Members and Friends.

MINUTES

The minutes of our August meeting are on our website; click on the “Minutes” button at www.ccas.ws or go to <http://www.ccas.ws/minutes/ccasminutes090111.pdf>

CCAS DUES

Thanks to all members who are up-to-date on payment of their 2011-2012 dues. 73% of 49members (three new members during December!) are paid up.

If you are one of those who has overlooked the matter, please make your payment either by bringing to the January 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 recent Capital Purchases.

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

Jan 21 Feb 18
Apr 21 Mar 24 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 further 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

January Observing:

Observing Highlights for January, 2012 at Cape Cod:

With the longest nights of the year still with us, backyard stargazers have plenty of time to enjoy this month's many offerings. Seven planets put on nice displays during 2012's opening month. The two brightest — **Venus** and **Jupiter** — dominate the sky as darkness falls. Venus shines 4 times brighter than Jupiter, and the latter glows twice as bright as any star. **Uranus** and **Neptune** also linger in the early evening sky, although you'll need binoculars to spot them. And, returning to the stage after a long absence, **Mars** begins a multi-month appearance in which it grows quickly and dramatically as earth "catches" it on the inside orbit track. Finally, although, for now, you have to wait until after midnight, **Saturn** is nicely visible late at night in January and it won't be long until, once again, it is a prime time star.

Please consult the January Issues of *Sky and Telescope* (pp 43-51), *Astronomy Magazine* (pp 40-51), and *Astronomy Magazine Online* (See Ref 5) for more information on these highlight topics and others.

Watch Venus grow (from 13" to 15") during January and begin to grow gibbous (from 83% to 75% lit). Blazing (mag -4) Venus acts as a "pointer" to mag 8 **Neptune** on the evening of January 12; this night the blue planet sits only 1.2° north of Venus.

Jupiter and its moons continue their show during January. Don't miss taking a look through good binoculars or telescope the evening of January 21. All four Galilean moons appear tightly clustered near the planet, a fairly rare sight!

Shadow transits of Io occur this month on January 4th (begins at 11:07pm EST), January 13th (begins at 7:32pm (prime time!)), January 20th at 9:28pm (again!), and January 27th at 11:24pm. It takes Io's shadow about two hours to cross the planet.

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 January *S&T*, p 47; January'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 shadow transits is given in the January *S&T*, p52

After a long absence, **The Red Planet** returns to the evening sky in January rising at 10pm on Jan 1 and earlier thereafter as the month proceeds. No other planet changes appearance during January as much as does **Mars**; it nearly doubles in brightness, going from magnitude 0.2 to magnitude -0.5, while its diameter when viewed through a telescope grows 30 percent, from 9.0" to 11.7". Mars hasn't

appeared 10" and larger to us for more than two years. It reaches opposition on March 3rd.

Magnitude 5.8 **Uranus** in western Pisces, and mag 8.0 **Neptune**, in Aquarius, are still well placed for observation right after dark in our southwestern sky. See Reference 4 for finder charts. Don't be late for Neptune; end month it sets at 7:48 only an hour after sunset in the Cape Cod sky.

Mooncusser's Almanac and Monthly Alert¹ By Peter Kurtz January 2012

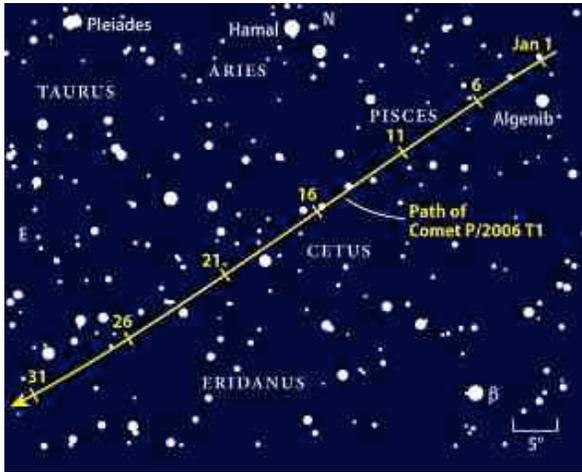
Object	Jan. 1 (EST)	Jan. 15 (EST)	Jan. 31 (EST)
Sun	R: 07:07 S: 16:20	07:05 16:34	06:54 16:54
Moon	R: 11:10 S: 00:25	23:23 10:13	10:42 01:06
Mercury (predawn)	R: 05:38 S: 14:56	06:19 15:22	06:51 16:23
Venus (evening)	R: 09:12 S: 19:04	09:01 19:38	08:40 20:15
Mars (evening)	R: 21:59 S: 10:53	21:16 10:06	20:12 09:05
Jupiter (evening)	R: 12:11 S: 01:34	11:17 00:42	10:18 23:47
Saturn (late night)	R: 01:14 S: 12:19	00:22 11:26	23:21 10:24
Uranus (evening)	R: 10:59 S: 23:04	10:05 22:11	09:03 21:11
Neptune (early eve)	R: 09:44 S: 20:21	08:50 19:28	07:48 18:28
Pluto (dawn)	R: 06:37 S: 16:20	05:44 15:27	04:43 14:26

The Quadrantid meteor shower peaks January 4. The quadrantid shower is brief, so viewing at or near peak is essential. It will be worth your while to get up early and view until dawn in the east/northeast. Look just under The Big Dipper beginning at moonset (in the west at 2:51am). Sixty to two hundred meteors per hour can appear at peak. Their name originates from the now-defunct constellation Quadrans Muralis, which was formerly designated for this area of sky.

This month our reliable companion **Comet Garradd** is best viewed in the early morning rather than evening hours. Look for it glowing around 6th magnitude in the constellation Hercules, about two binocular fields to the upper right of Vega (somewhat below but in the same part

of the sky as the Quadrantid radiant (on January 4th).

We have a new visitor replacing Garradd in the evening sky. **Comet P/2006 T1 (Levy)** returns and has been brightening rapidly during the past few months; it should reach 7th or 8th magnitude in January. See the finder chart on the next page; look west of Jupiter.



[Finder Chart for Comet P/2006 T1]

Occultations:

There will be several occultations of stars by asteroids taking place after Christmas and into January. Two are worthy of note here; Bernie Young is/will be making preparations for both of these and will update folks by email

in each case as events unfold:

- Wednesday, December 28th: Asteroid (21807) 1999 TH14 occults an 8.5mag star at 7:31pm EST, (prime time).
- Sunday, January 29th: Asteroid (1746) Brouwer occults a mag 7.0 star, HIP 12184, at 8:22 EST.

Asteroid occultations are becoming “*au courant*”: the Brouwer event is reported in an article in the January issue of *S&T* magazine, p 51. See also the online reference: <http://asteroidoccultation.com/indexAll.htm>

Moon Phases, January, 2012

First QTR Sunday, January 1, at 1:15am EST
Full Moon Monday, January 9th, at 2:30am EST
Last QTR Monday, January 16th, at 4:08am EST
New Moon Monday, January 23rd, at 2:39am EST
First QTR Monday, January 30th at 11:10pm 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.

Email from Astronaut Dan Burbank to family and Friends (which included “First Light”...

It isn't often that a CCAS member sends an email to First Light from the ISS, so it is more than appropriate that we make this message available to friends and members of the Society:

Subject: Pre-dawn comet from ISS
Date: Friday, December 23, 2011 4:36 AM
From: JSC-Dan

Dear family and friends –

First off, let me apologize for taking so long to send out a note to you. It has been a whirlwind these past five weeks – incredibly busy, but more fun than I could ever have hoped. It has pretty much taken all of my energy and brain power just to learn the ropes and keep the systems and science moving along while we waited for our three crewmates to arrive and bring us back to full strength. At last that arrival is one day away and tomorrow afternoon we'll be welcoming Oleg, Andre and Don aboard the ISS.

Tonight I just have to share with you a picture I took a few hours ago of comet Lovejoy over Australia. This is one of a few hundred time sequence shots that we hope to make into a short movie of a rare comet rise seen from space.

Two nights ago around 11pm GMT I floated down to the cupola to close up the shutters for the night, when I saw the most amazing thing I've ever seen in space. That's saying a lot, since practically every day up here is filled with amazing things. It was nighttime beneath us as we headed southeastward toward Australia. As the sun was about to rise ahead of us, I started to make out a long greenish arc that extended perpendicularly from the earth limb for several degrees. As I watched it grew longer and brighter until it reached all the way from the horizon to the bottom of the JEM (Japanese Experiment Module). Overall I'd say it was about 8-10 degrees (or about 20 moon diameters) long. It was so bright that I could still make it out for the first few

seconds after the sun began to rise. It occurred to me that it might be a comet, but I didn't know of any that were visible now and in my experience comets have generally been things I could only see in my telescope or at least with binoculars. This was staggeringly bright and easy to see naked eye even in the partial glare of the sun.

The next morning in our daily message from the NASA crew earth observations team, it said that the day before a gentleman in Tasmania had reported seeing a comet named Lovejoy just before sunrise. It had been seen approaching the sun but with a closest point of approach of just 140,000km it had been expected to burn up. Instead, it apparently survived that close encounter but absorbed a massive amount of heat and radiation that sent streams of dust and ionized gas millions of miles out into space radially outward from the sun. From our vantage point in low earth orbit we have the perfect view and completely unobstructed by intervening atmosphere, the dust (curved) and ion (straight) tails are spectacularly bright and easy to see against the backdrop of black space. Talk about being at the right time in the right place!

Merry Christmas and Happy New Year!

dan

**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 December2007-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.
- 4) <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 January: http://www.astronomy.com/en/News-Observing/Sky_this_Month/2011/11/Venus_hits_the_spotlight.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>