



First Light

The Newsletter of the Cape Cod Astronomical Society

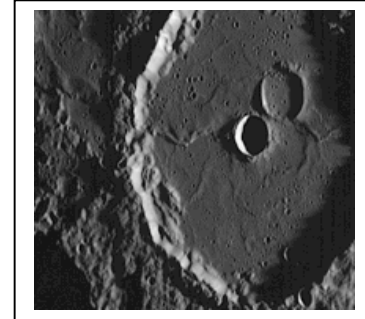


November, 2008

Vol.19 No. 10



Hubble Telescope: Some bad news; some good news.
See page 4



Do you know the name of this Crater?
Do you know where it is? See page 5.



Interested in participating in a program to map the quality of seeing in skies around the world? Check out this website: http://www.windows.ucar.edu/citizen_science/starcount to learn how you can take a look at Cygnus any night between 10/20 and 11/3, record the quality of the sky you see (easy guidelines given), report same online, and see your own results together with other results nearby and worldwide. You can send in as many reports as you wish!

Bright New Stars:

We welcome to our membership John Carlisle of Barnstable. John has an Orion 90mm telescope. John, please let us know a bit more about yourself and your background and interests in amateur astronomy so members can learn more about you in First Light.

As always, we wish to invite recently joined members not yet introduced as "Bright New Stars" to send an email to the info@ccas.ws email address letting us know a little more about themselves: background, astro equipment preferred if any, and interests.

Thoughts on First Light

Thanks to members for contributions this month: two wonderful moon photos from the Tom Leach observatory, and a report on observing experiences in the dark skies of Vermont from Bernie Young.

Thank you, members!
"First Light wants YOU!"

CCAS Events

New member and avid astronomer Paul Cezanne has agreed to speak on the fine points of Binocular Astronomy at our meeting on November 6th. Paul keeps track of the observing he does and should have many interesting pointers on and examples of binocular observing. Paul keeps a tally of his nightly outings in his astronomy blog *Paul Cezanne's Astronomy Observing Reports*.

Looking ahead, on December 4th, Mike Farber will talk on the Morse Payne Cornerstone Project: studies on how the Pilgrims used a sophisticated blend of surveying techniques to subdivide our lands. Our forefathers knew the importance of the night sky for navigation and getting a bearing. They used science to delineate division boundaries on Cape Cod. The Cornerstone Project has drawn a lot of interest from local historians and archaeologists. It is likely that after hearing this talk, members of CCAS members may want to join Farber in work on this project.

Thanks to Gary Derman for his educational and thought-provoking presentation on "Sky Pointing"... the approaches taken to calculating the positions of celestial objects and the precision and errors associated with such procedures.

Thanks to Tom Leach, our Programs Director, for the good work he does to bring us informative speakers and topics; please be sure to contact Tom if you have ideas for upcoming speakers or programs; don't forget yourself!

"Dark Saturdays" **Information on November and December** **Winter Star Parties**

One Star Party is scheduled each month at 7:30pm at the Werner Schmidt observatory. The target date is set as the Saturday evening closest to the timing of the New Moon. A decision has been made to move the Star Party for November from the Saturday nearest to the day of the New Moon to Saturday, November 22, the Saturday BEFORE Thanksgiving.

The December Star Party will stay on "Dark Saturday", specifically, Saturday, December 27th, which, in fact, is New Moon Day for December.

Outreach to Students

Your editor and others in the Society have begun work with two faculty members at D-Y High School, Adam Cutler and Jim Mitchell, to find ways to significantly improve involvement of CCAS in astronomy initiatives at the school. Jim will be teaching Astronomy at D-Y this year and a D-Y Student Astronomy Club has been formed. Discussions by phone and email will be followed by visits by CCAS

members to the school. We envision increasing participation of D-Y students and faculty in CCAS meetings and regular public star parties, special observing nights for the D-Y group at the Schmidt, and, now and then, CCAS members making brief presentations on astro topics in class at D-Y. Any members wishing to become involved in these initiatives please contact Peter Kurtz.

Executive Corner

There was no meeting of the Executive Board in October. The next meeting of the Executive Board is scheduled for Tuesday evening November 18.

From the Dome

... this from the Observatory Staff...

Unfavorable weather has spoiled our first two planned "Dark Saturday" Star Parties: September 27th and October 25th; both events had to be cancelled. The next scheduled event is November 22. Check our website after noon on "Dark Saturdays" to be sure we have not had to cancel because of poor skies.

During October, work continued on streamlining the installation and bringing online the SBIG CCD camera and accessories on the main 16" telescope at the observatory.

The objective is to make readily available two alternative configurations: the first for regular observing "eye at the telescope eyepiece" up in the dome and a second allowing observing at the television screen down in the lower room. Work "through the camera" on the screen downstairs offers observing access to persons not easily able to climb upstairs and provides the observing advantages of multiplying light over lengthened exposure times. The camera also provides the capability to make movies of movement of targets over time.

Work also is continuing on bringing online the computerized "Go To" capabilities of the Obsession 18" Dobsonian.

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.

Foundation News...

...when we have input from the Foundation...

Reminder: CCAS has both 8" and 14" Dobsonian telescopes for loan to members. Currently, Rich Kosinski has the 14" at his home for observing and Bernie Young has the 8". Bernie has provided us (page 6) an entertaining and informative report on his recent work observing with the 8" in the dark skies of Vermont. Bernie is making some improvements to the 8". If you wish to borrow one of these 'scopes, contact your editor at info@ccas.ws

More on November Observing

Daylight Savings Time ends at 2am on Sunday, November 2nd. At our latitude, that means you can do some observing before dinner if you wish.

Two Distant Planets Stationary during November

Two planets appear "stationary" during November as they make the transition from apparently moving slowly toward the west from day to day to slowing and then moving apparently toward the east from day to day. Both of these planets are distant but, because they have become favorite targets using our 16" telescope at the Schmidt in recent months, they are of special interest. Both become "stationary" in November. We make note of these events here in case anyone would enjoy studying the changes of movement of either over the next two months or so.

Neptune (a blue point source in our 16" at 450x, about magnitude 7.9,) appears well (20°) above the western horizon as late as 9pm on November 2nd, its "stationary" date. Higher each night before then.

Novices to astronomy might be interested in overviewing how the phenomenon of slowing, stopping, and reversing happens. Take a look at Figure 1 on page 8. That figure shows the relative positions of earth and Neptune on the orbital race tracks for the following dates. Keep in mind, that for this illustration, Neptune can be considered static in its orbit since its movement is very slow relative to the movement of the earth which is mainly responsible for the direction change phenomenon.

Beginning about October 15th, the pace of **Neptune** moving apparently west in our sky begins to slow and on November 2nd it is "stationary"... appearing not to move at all for a day or two. By November 17th, it has begun slowly to "move" again but now apparently from west to east day to day. Study the Figure 1. You can see what is going on.

If you miss the **Neptune** dance, or your telescope can't quite see the blue planet, **Uranus** puts on a similar show culminating in stationary status at the end of November. **Uranus** (clearly a small globe in our 16" at 450x, about magnitude 5.8,) appears well above (30°) the western horizon as late as 9pm on November 28th its "stationary" date. Higher in the sky before then. Prior to November 28th it appears to be moving from east to west day to day, then slows (a relative term!) "stops" on the 28th, then slowly begins to appear to move west to east, the speed gradually increasing, as we view it after the 28th. Orbital models similar to the illustration on page 8 show how it happens.⁴

November Observing:

Mooncusser's Almanac and Monthly Alert¹

By Peter Kurtz

NOVEMBER 2008

Note: DST ends at 2am on Sunday, Nov 2nd. For this reason, the first column here is for Nov 2nd rather than our usual 1st of the month and has data for EST times to be comparable to the rest of the table.

Object	Nov 02 (EST)	Nov15 (EST)	Nov 30 (EST)
Sun	R: 06:15 S: 16:33	06:30 16:20	06:47 16:11
Moon	R: 10:57 S: 19:28	18:02 09:38	09:32 18:13
Mercury (dawn)	R: 05:02 S: 16:06	06:00 16:04	07:06 16:15
Venus (evening)	R: 09:31 S: 18:27	09:52 18:40	10:04 19:06
Mars (-----)	R: 07:05 S: 16:59	07:02 16:36	06:57 16:13
Jupiter (evening)	R: 11:28 S: 20:42	10:45 20:01	09:56 19:16
Saturn (pre-dawn)	R: 01:47 S: 14:37	01:02 13:49	00:07 12:53
Uranus (evening)	R: 14:26 S 01:56	13:35 01:05	12:35 00:05
Neptune (evening)	R: 13:16 S: 23:36	12:26 22:46	11:27 21:47
Pluto (early eve)	R: 09:49 S: 19:45	09:00 18:56	08:03 17:59

Moon Phases, November 2008¹

First QTR Wednesday, November 5 at 11:03pm EST

Full Moon Thursday, November 13 at 1:17am EST

Because perigee occurs nearly the same day as the Full Moon this month, extremely High and Low tides will occur.

Last QTR Wednesday, November 19 at 4:31pm EST

New Moon Thursday, November 27 at 11:55am EST

While not boasting especially intense events, November sports an almost continuous display of shooting stars.

The following **meteor showers** peak at the dates given in November:

- South Taurids: from October 30th thru November 27th, peaking November 5th; ~7 meteors/hour at peak; the radiant is on the other side of the sky from the quarter moon on peak date.
- North Taurids; concentrated from November 9th through November 14th, peaking November 12th; 7 meteors/hour at peak; unfortunately, the radiant and full moon are very close in the sky on peak date.
- Leonids; concentrated from November 15th thru November 19th, peaking November 17th; 12 meteors/hour at peak; unfortunately, the radiant and quarter moon are close in the sky at peak.

Special Photo Opportunity!

The last day of November may offer a most spectacular dusk viewing of Jupiter, Venus, and the crescent moon with earthshine on the southwestern horizon. At 5pm on Nov 30th, about 50 minutes after the sun has set, the 9% crescent moon (9° altitude), blazing Venus (14° altitude; magnitude -4) and Jupiter (altitude 16°, magnitude -2) will be nicely and tightly grouped within 10° of each other just above the horizon. This grouping offers the opportunity for spectacular photos with a good zoom digital camera on a tripod. The very tight (2° separation) Jupiter-Venus pair also offers an additional special photo-op through a telescope having a reasonably wide-angle field of view.

For several weeks prior to the 30th, enjoy naked eye viewing of Venus “chasing up” to Jupiter from night to night; ... and watch Venus “run away” from Jupiter for several weeks after the 30th.

2

Libration and Declination Tables for the Moon

NOVEMBER	
Max Longitudinal	Min Longitudinal
11/20 (7°)	11/8 (-7°)
Max Latitudinal	Min Latitudinal
11/25 (7°)	11/12 (-7°)
Max Declination	Min Declination
11/15 (27°)	11/1 & 11/29 (-27°)

1,3

Minima of Algol visible after dark at Cape Cod:

[Only minima actually timed near or after sunset thru predawn at Cape Cod are noted.]

NOVEMBER	
2:18 am	Thursday, Nov 6
11:07 pm	Saturday, Nov 8
7:56 pm	Tuesday, Nov 11
6:45 pm	Friday Nov 14
4:01 am	Wednesday Nov 26
12:50 am	Saturday Nov 29

Items of Interest in Recent Astronomy News:

From time to time news items appear in current Astronomy media that are of special interest or significance. When this occurs, First Light will feature alerts to such news with starting references:

The Hubble Telescope: A Bad News/Good News Story during October

Few advances in technology have had a greater impact in recent years on the progress of modern astronomy than the Hubble telescope.

The Bad News:

Many of you may remember the spectacular Hubble photo published on the front page of last month’s First Light in celebration of the then upcoming eleven day mission to upgrade and tune the Hubble telescope.

The mission has been delayed because early in October, NASA lost much of its control contact with Hubble, Suddenly, scientists had to scramble to understand what might have to be changed in the upcoming mission to allow it not only to be an upgrade and tuning mission but maybe to be a “bringing back-to-life” mission. There was even the possibility that the end was near and that STS-125 might have to be cancelled and Hubble left to die. This after many years of political wrangling over whether to formulate and schedule a tune-up mission at all. As this is written, the launch date for STS-125 (SM4) has not been rescheduled; in fact the repair protocol is at this time undefined.

The Good News:

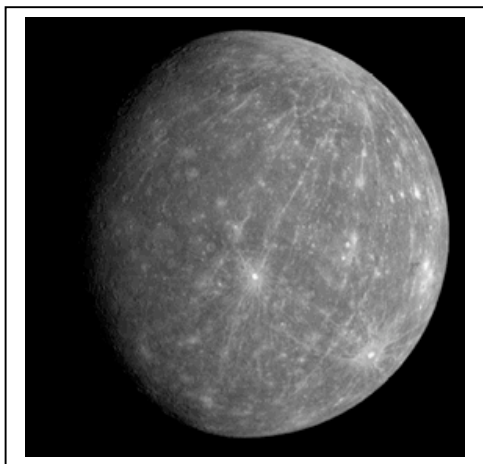
As of October 16th, NASA announced that things are going well and as planned for scientists to “reconnect” communications with the Hubble Space Telescope by “waking up” a backup communication option and hardware.

During the night of Oct. 15, Space Telescope Operations Control Center engineers at NASA's Goddard Space Flight Center successfully turned on and checked out Side B of Hubble's Science Instrument Control and Data Handling (SIC&DH) system. Engineers were then able to retrieve the Advanced Camera for Surveys (ACS), Wide Field Planetary Camera 2 (WFPC2) and Near Infrared Camera and Multi-Object Spectrometer (NICMOS) instruments. They were being held in safe mode, and were turned on, each showing they had a working interface to the Side B of SIC&DH. The instruments were then commanded back into safe mode. As this is written, commands are being sent from Side B to each of the instruments and engineers have begun recalibrations of the telescope's science instruments, expected to be completed by end of day October 16. If things continue to go well, these successes should lead to early refinement of repair mission plans and rescheduling of the long awaited STS-125 repair/upgrade mission launch.

The STS-125 mission will return the space shuttle to the Hubble Space Telescope for this one last visit before the shuttle fleet retires in 2010. Over 11 days and five spacewalks, the shuttle Atlantis' crew will make repairs and upgrades to the telescope, leaving it better than ever and ready for another five years – or more – of research.⁵

Mystery Crater: What is it? Where is it?

Astronomy Magazine Online⁶ recently published a Gallery of new Photos from the spacecraft **Messenger's** second flyby of Mercury. The picture you see on the page 1 of this issue is the crater Machaut on Mercury. Machaut crater is approximately 60 miles (100 kilometers) in diameter, first seen under high-Sun conditions by Mariner 10 in the 1970s. The crater is named for the medieval French poet and composer Guillaume de Machaut. This image shows an amazing new view of Machaut taken during MESSENGER's second flyby of Mercury.



Just above is a wide-angle picture of Mercury taken about

90 minutes after the spacecraft's closest approach as the spacecraft is flying away from the planet. It is hard to believe this is the planet Mercury and not our own moon featuring the bright rayed crater Tycho.

Launched more than four years ago on August 3, 2004, Messenger is now on its second pass by Mercury. The spacecraft is more than halfway through a 4.9-billion-mile journey to enter orbit around Mercury that includes more than 15 trips around the sun. In addition to flying by Mercury, the spacecraft flew past Earth in August 2005 and past Venus in October 2006 and June 2007. The project is the seventh in NASA's Discovery Program of low-cost, scientifically focused space missions.

The Mercury Surface, Space ENvironment, GEOchemistry, and Ranging, spacecraft will pass 125 miles above the planet's cratered surface, taking more than 1200 pictures. The flyby also will provide a critical gravity assist needed for the probe to become, in March 2011, the first spacecraft to orbit Mercury.⁷

TOOLS FOR OBSERVING

The following announcement concerning release of a new edition of an astronomy field guide was received this month in the CCAS email inbox. Your editor has asked the author to send us an evaluation copy when it becomes available. When we have it, we will share with members at an upcoming meeting. Meanwhile, if anyone is interested, I can provide them the full text of the message from the author, Peter Birren, as received in the CCAS inbox.

Objects in the Heavens, 4th edition, by Peter Birren; 22 photos by Naoyuki Kurita; 118 pages, digest size, black coil bound, \$29.95 ISBN: 15536 9662-X

Fully revised pocket-size astronomy field guide features all known deep-sky objects to magnitude 10 for telescopes and binoculars. Galaxies, clusters and nebulae of all types were culled from 33 observatory catalogs. Object-oriented maps includes stars, double stars, carbon stars and asterisms, each object is defined by a unique map symbol. Compact, informative, at-the-scope reference for all stargazers.

**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.**

Vermont viewing with the 8" Dob

[Note: The Society has both an 8" and 14" Dobsonian telescopes available for loan to members. Bernie Young recently borrowed our 8" and took it for observing to the dark skies of Vermont. Thanks to Bernie for this report on his experiences and for work he has done and is planning to do to improve capabilities of this telescope.]

We have a time share week in Stowe, Vermont in late September, and this year it was a little later than normal and coincided with the new moon. The town doesn't present a light problem; it is several miles away, and almost 1000 feet below. You can go out back behind the condominiums up the hill and have a fairly dark sky.

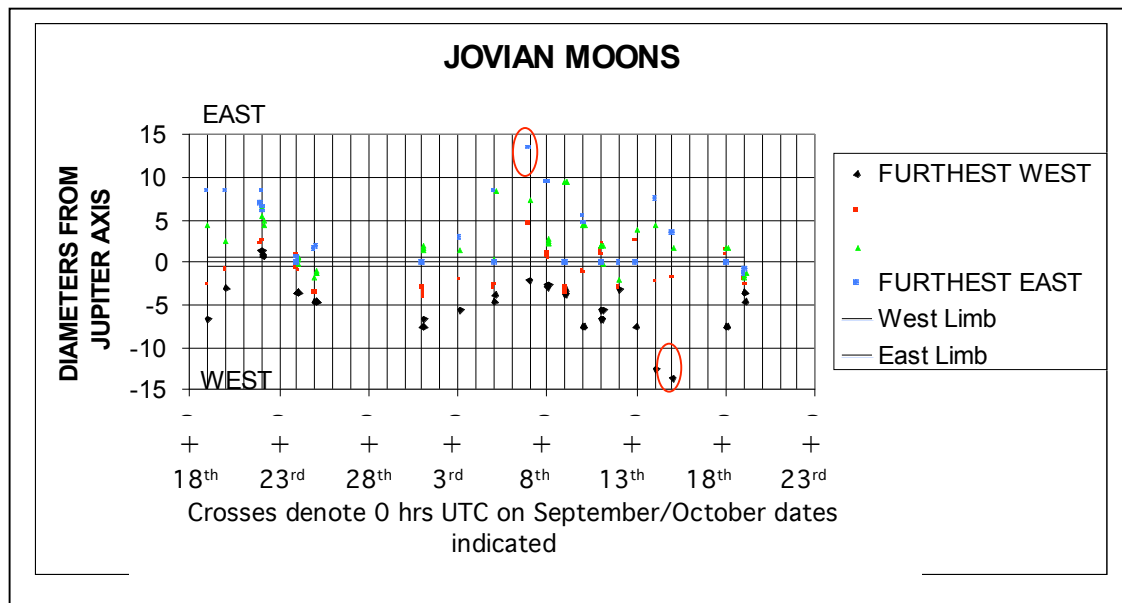
My interest this trip was to re-enact Galileo's experience of tracking the four largest moons of Jupiter. One moon would be easy, but with interrupted viewing due to weather, the inability to make precise measurements, and my lack of ambition to stay up all night, sorting out the four was expected to be challenging.

The 8" Dob is easy to handle, fits across the back seat of the Prius, and is set up easily.

The lack of any coordinate reference system prohibits precise measurements. So I estimated the position of the moons in terms of "Jupiter diameters." That's reasonably accurate up to about three diameters, but not so good out around twelve diameters. My expectation was that if I could get to the point where I could predict the largest orbit, it would be possible to concentrate on the second largest orbit, continuing to refine the previous ones, and work my way inward. The most precise result for measuring the period would be observing successive occultations. After a month of sporadic observations, I think it can be done.

Vermont was rainy and mostly overcast. Tuesday and Thursday did provide a few hours of good viewing. I also took my cardboard star pointer to continue to expand my familiarity with the 57 navigational stars. That gadget is amazingly accurate, even "free hand" holding it at head height, aiming at Polaris, and guessing at what is horizontal.

My observations of the Galilean Moons of Jupiter are summarized below. I caught the moon with the largest orbit at extremes on October 7 and again October 15 (red circles.) That gives a half period. That's a start at



predicting one moon, and if I can identify it when it gets mixed up with the other three, I may be able to estimate the second largest orbit.

Of course I couldn't help but take a peek at our own moon as it waxed across the neighborhood of Jupiter. At sunrise (on the moon) the contrast of exposed and shaded terrain caught my attention.

Tracking a planet over several nights puts several stars in your view you might not otherwise notice. Early in the project, while looking for some Messier objects, I noticed a pair of triangular formations. I noted them, and might try looking for them the next time a planet is in their vicinity. There are probably lots of other interesting skymarks along the ecliptic, for someone who frequents that part of the sky with a good telescope.

Thoughts and Progress on Improvements to the Dob:

Rainy weather provided time to think about improvements one might make to the telescope. One of the rainy mornings, I booted the computer, opened Autocad, and designed an equatorial mount for the Dob. I'm thinking of eliminating the time of day and day of year circles, to save weight and increase accuracy, since one can compute the hour angle mathematically once, and observe your target. Alternatively, you can observe an unidentified object and invert the calculation to obtain the right ascension and then identify the object on a star chart.

With that in mind, I have painted the outside face of the Dob's trunion bearings white, drilled a locating hole in the center, and made two mylar dials, one plus or minus 90 degrees for declination and one full 360 degrees for altitude. Decoupage adhesive would make a clear, uniform background for attaching the dials.

I have disassembled some furniture I picked up at the dump to build the equatorial mount. Future borrowers could then decide which mount they want to use. The existing Dob alt/az mount could benefit from an azimuth dial, and both axes could benefit from some sort of tangent screw to allow precise repositioning or measuring. For example, it was easy to find Jupiter, but without any dials, finding the three Messier objects nearby in Sagittarius was a failure. Being able to shift the altitude and azimuth precise amounts over short arcs should make that easy.

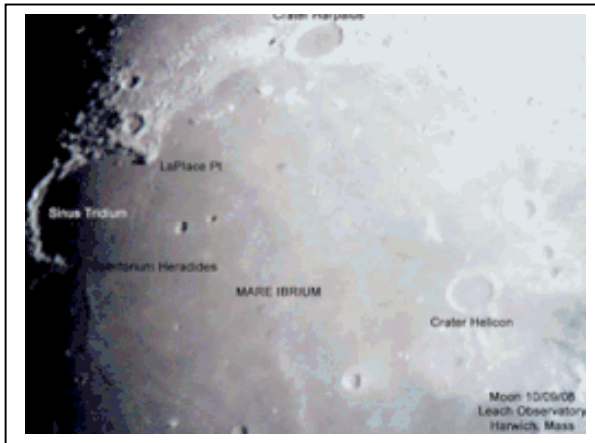
Precise measuring requires an eyepiece with cross-hairs. I took a specimen of my long gray hippy beard, bent it in a loop, and tried to see if I could focus on it at the focal length of the eyepiece. The hair was a little frazzled, but spider's webs have been used for transit crosshairs. I know you can buy eyepieces with cross hairs, but it's more rewarding to make one.

Now for the problems. When I had to realign the Telrad finder twice the first night, I became suspicious, and found the main mirror of the Dob was slipping out of its three tab holder. It rained the next day, so I took the tailgate out the next day, and concluded we need to mount the mirror better. While it was out, I did the usual focusing test with an led flashlight down the long dark hall. I think this might be a good thing to do at a future meeting, if there are enough people who have never seen it done. The last time I did that was 52 years ago.

I folded up some paper towels to eliminate play, re-secured the mirror, and re-collimated it. We need to have a meeting of the minds on how to better mount the mirror. Dobson's instructions call for using RTV sealer in three gobs, with keeper blocks on the inside of the scope to prevent the mirror from going too far if it does come loose. The other option is to use a more rigid version of the three dogs around the periphery, the current method. The mirror could use a cleaning, too.

CCAS ASTROPHOTOS OF THE WEEK

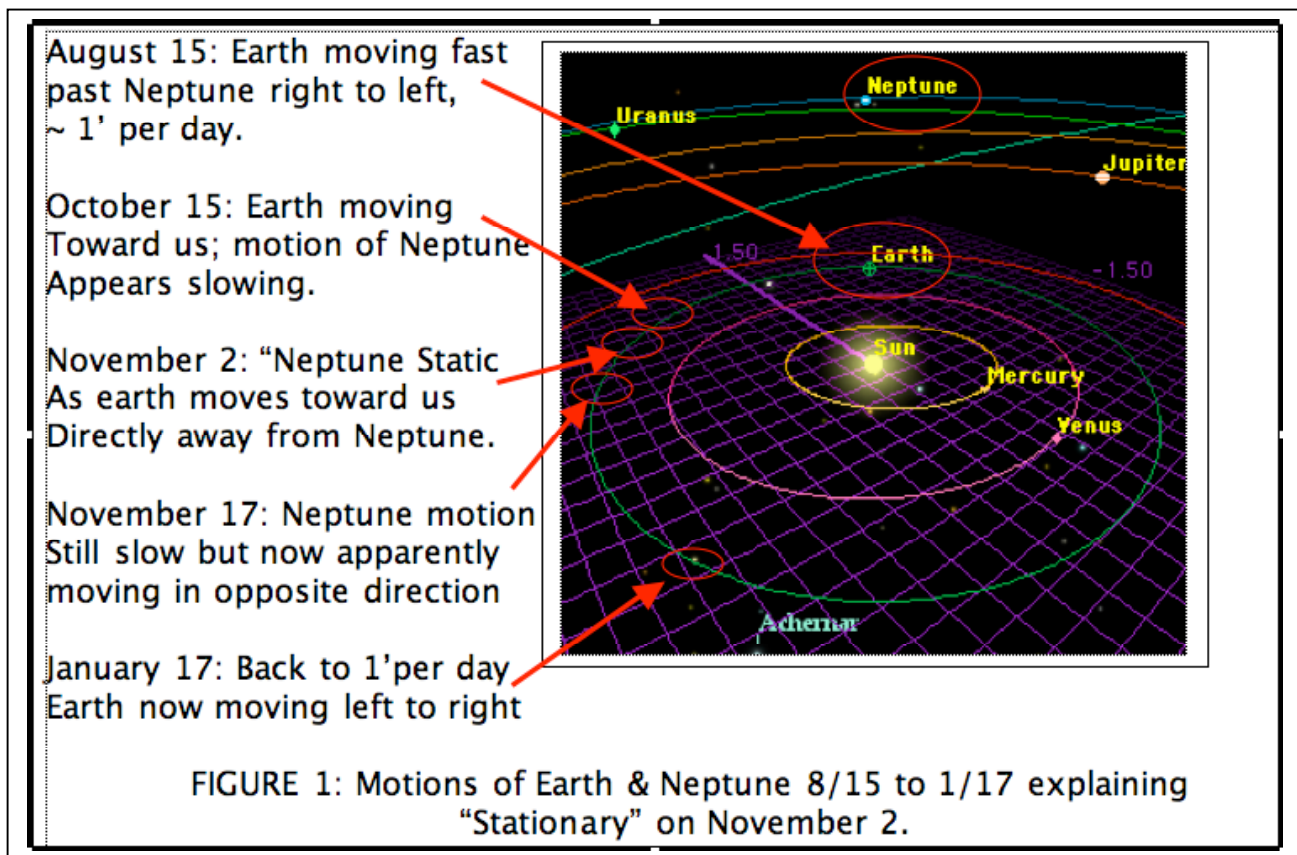
Two Spectacular Moon Shots from the [Tom Leach](#) Observatory, 10/9/08
Moon was 74% Waxing Gibbous



At left, sunrise on the shores of the Sinus Iridium

Tycho, and Bullialdus in Mare Nubium

Orbit Pictures Showing Why Neptune becomes “Stationary” on November 2, 2008
(See page 3)



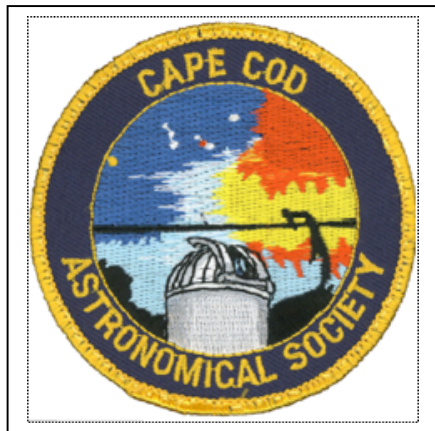
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Treasurer	Pio Petrocchi	508-362-1213
Observatory Director	Michael Hunter	508-385-9846
Observatory		508-398-4765

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.



Reference Information:

- 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 2007*, and other sources. The *Observer's Handbook, 2007 and 2008*, 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-January 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://ssd.jpl.nasa.gov/sbdb.cgi?sstr=17P%2FHolmes;orb=1:cov=0;log=0#orb>
- 5) <http://www.universetoday.com/2008/10/16/looking-good-so-far-for-hubble/>
- 6) Astronomy Magazine Online, 10/10/08, <http://www.astronomy.com/asy/default.aspx?c=ga&id=90&aid=7473>
- 7) http://messenger.jhuapl.edu/the_mission/index.html