



First Light

The Newsletter of the Cape Cod Astronomical Society



July, 2011Vol.22 No. 7

Editorial

End of an Era....

The NASA picture here shows the final move of its kind: the space shuttle Atlantis moving on its tractors at less than 2km/hr the 5km to Launch Pad 39A at Cape Canaveral, where it is currently scheduled for a July launch, the last shuttle launch as mission STS-135, to the ISS. This launch will be very bitter sweet for most of us, especially we who witnessed STS-1 more than 30 years ago. Somehow we thought our citizens would always be flying in space. No more on the shuttle... But:



It continues...



We have just learned⁶ that CCAS Lifetime Member and astronaut (STS-106, September, 2000; STS-115, September, 2006) Dan Burbank will fly to the ISS this September on a Russian Soyuz and, now and then while aboard the ISS for six months, he will wear a t-shirt or cap bearing the CCAS logo. Dan may also make ham radio contact with Harwich school kids from the ISS if arrangements pan out. (Please see reference 6 to find out how we learned of this!)

Now how is that for good news! Not only will Americans still be flying in space after the “Shuttle Era” but one of those Americans will be Cape Cod’s and CCAS’ own Dan Burbank. Best wishes to Dan as he traverses the preparations for and begins his Soyuz flight in September, works on the ISS for six months, and flies home in March.

For more than a year now, a theme from ancient times or an editorial has occupied this beginning space in First Light. To date, the topics were all chosen or composed by the First Light Editor. Perhaps you might have a theme or editorial position related to astronomy which you might enjoy sharing with others in this space. If so, please send to us.

Next Monthly Meeting: is Thursday, June 7th at the D-Y Library. Werner Schmidt Observatory. CCAS former President Gary Derman will present: **Mirror Grinding, Configuring and Testing an 8" Telescope.** (Please see the moving banner and the “tail of the rocket” on our website’s home page for more information on future speakers and topics.)

In this issue: / A New Era / July is **Dues** month! / [Election of Officers](#) / Neptune Comes Full Circle / Video Camera Resources at the WSO

Bright New Stars:

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*.

Thanks to Mike Hunter for his "From the Dome" report and to Bernie Young for his overview of Video Camera options at the Werner Schmidt Observatory (page 4).

CCAS and Related Events:

Many thanks to Mike Hunter for his informative and impressive overview of early experiments **taking astro photos with his new Canon EOS Rebel XS 1000D** using either of two telescopes (prime focus) or his versatile Canon image-stabilized telephoto zoom as lenses. Mike took an amazingly detailed and sharp (tolerated a lot of zoom on computer view) photo of a nearly full moon using the big telephoto lens and traversed his newbie learning curve by taking most impressive photos of Saturn, the Orion and Horsehead Nebulas; a spectacular photo of the Andromeda Galaxy was clearly the most satisfying accomplishment to date. Mike's quick success with new equipment inspired **many of us to think seriously about taking up his new hobby.**

On July 7th, past CCAS president Gary Derman will present: **Mirror Grinding, Configuring and Testing an 8" Telescope.** Forty years ago, Gary ground and polished an 8" f/6.6 mirror accurate to better than 5 millionths of an inch and built a Newtonian telescope. Join us as he describes how anyone can achieve a similar result without the need for expensive equipment. Gary will discuss grinding, polishing, figuring, and testing of the parabolic mirror as well as construction of the telescope and an equatorial "pipe" mount.

At our meeting on August 4th, Ed Ting will discuss **Making use of a Webcam in Astrophotography, What You May not Know.** Ed publishes one of the most comprehensive telescope review websites on the internet. Inside, you'll find reviews of over 100 telescopes, eyepiece reviews, a beginner's advice column, feature articles, and lots more! His telescope review website has become a very popular resource for amateur astronomers interested in upgrading equipment and for the novice looking to buy his first scope.

Thanks again to Tom Leach, who continues to put together great programs of speakers for our meetings. Speakers for the CCAS Lecture Series are now fully scheduled through

our August meeting!

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 President and Program Chairman. For sure he will follow up.

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

The minutes of our June meeting are on our website; click on the "Minutes" button at www.ccas.ws or go to <http://www.ccas.ws/minutes/ccasminutes060211.pdf>

SPECIAL NOTICE!!!! **2011-2012 Dues are Due July 1, 2011**

Members: Please plan to make your payment either by bringing to the July meeting or mailing directly to CCAS at PO Box 207 Harwich Port MA 02646.
Thank you.

Executive Corner

The CCAS Bylaws stipulate that the membership must elect Officers in an annual July election. An ad hoc Nominating Committee has been successful in finding the following individuals willing to serve: for President, Tom Leach; for VP, Mike Hunter; for Secretary, Charlie Burke; and for Treasurer, Peter Kurtz. Please come to the July 7 meeting prepared to make other nominations if you have any and then to vote. Thank you.

From the Dome...

... from Mike Hunter

Members of the Observatory Staff have been researching the capabilities of various video cameras at the "Dome" (please see story on page 4) and refining protocols for making images from the telescope available on monitors on the main floor of the building when needed.

Our first star party of the summer season was on June 16 and was a real success. There were eighteen guests and seven observatory staff in attendance. Most of the guests were residents of Thirwood Place who came as a group. It has been many years, if ever, that a season opener has had that kind of attendance. Of course, the 23rd saw thick clouds and buckets of rain. So it goes on Cape Cod.

But, the forecast for the 30th looks good. Come out to The Schmidt for a look at the heavens through the big scopes and see the new cameras in action.

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

see reference 5 for the web address for *Astronomy*’s online edition of “The Sky this Month” for July.

Monthly Highlights

Rediscover Neptune where it was when first found! On July 12-13, Neptune returns as close as it will get to the position in its 165 year orbit where Johann Galle, a German astronomer, discovered it. You will remember that Galle found it very near to where a French theoretician predicted some large body “must be” because of irregularities in the orbit of Uranus.* The original discovery took place on September 23, 1846. At mag 7.8, Neptune will get to altitude 29° by 1:30am if you want to try to see it as exactly as possible at its discovery position. You can accomplish a near repeat of history later in the month without staying up quite so late: by July 30th, Neptune will be at 24° altitude by 11:30pm.

July Observing:



Mooncusser’s Almanac and Monthly Alert¹
By Peter Kurtz
[July 2011](#)

Object	July 1 (EDT)	July 15 (EDT)	July 31 (EDT)
Sun	R: 05:09 S: 20:19	05:19 20:14	05:34 20:00
Moon	R: 05:48 S: 20:28	20:18 06:16	07:01 20:13
Mercury evening	R: 06:41 S: 21:38	07:35 21:33	07:39 20:44
Venus (predawn)	R: 04:16 S: 19:24	04:36 19:42	05:10 19:50
Mars (late nite)	R: 02:59 S: 17:52	02:39 17:45	02:20 17:33
Jupiter (> midnite)	R: 01:27 S: 15:02	00:37 14:18	23:39 13:24
Saturn (evening)	R: 12:49 S: 00:42	11:57 23:48	10:59 22:47
Uranus (~ midnite)	R: 00:12 S: 12:27	23:17 11:32	22:14 10:28
Neptune (near midnite)	R: 22:53 S: 09:35	21:57 08:38	20:53 07:33
Pluto (evening)	R: 19:34 S: 05:21	18:38 04:24	17:33 03:19

*There is a wonderful retelling of this discovery story in the July issue of S&T, page 28. Also available in S&T online.

If you enjoy viewing **Saturn** and its moons, **there is some urgency** to “get to it” this month; by July 30th, Saturn sets a little after 10:30pm so is getting so low in the evening sky as to suffer less than the best viewing. By end August Saturn sets only 75 minutes after sunset.

Don’t forget to enjoy finding and watching the motions of Saturn’s moons as long as this “Saturn” season endures. Resources: if you don’t have “Gas Giants”, the iPod app for modeling the positions of Saturn’s (and Jupiter’s) moons at any date and time, positions for Saturn’s moons for July are given in graphic diagrams in the July issue of S&T (p 47.) Or go to the following web address to access S&T’s Java Utility for showing the positions of Saturn’s main moons for any date and time.

<http://www.skyandtelescope.com/observing/objects/javascript/3308506.html>

Magnitude 8 **Comet C/2009 P1 (Garradd)**, mentioned in last month’s FL, continues to move to the northwest during July as it crosses Pegasus the Winged Horse. Garradd will take a year to sail through the inner solar system and should remain a fixture in our skies from now until next summer. It currently glows around 8th magnitude and may peak near naked-eye visibility this winter. This fall it will approach

Resources: Please see the July issues of *Astronomy Magazine*, pp 36-43, and/or *Sky and Telescope*, pp 43-49, for good overviews of sky highlights for June. Please also

mag 6 (a binocular target) in Hercules. So if you want to follow it's brightening, now is the time to start. Check reference 5 for the July finder chart.

contact your editor for information or sources.

The **Delta Aquarid meteor shower** peaks July 30th. Unlike other showers that are intense only one evening, the debris that we see in the Aquarids is spread out enough in space that you will see reasonably frequent meteors from July 12 through mid August. The moon obliges by being "new" on peak day and at azimuths away from the radiant in Aquarius in days before and after peak day.

Anyone having an interest in monthly **Libration and Declination Tables for the Moon**² or **Dates and Times for the Minima of Algol**^{1,3} during this month please

Moon Phases, July, 2011

New Moon	Friday, July 1 st , at 4:54am EDT
First QTR	Friday, July 8 th , at 2:29am EDT
Full Moon	Friday, July 15 th , at 2:40am EDT
Last QTR	Saturday, July 23 rd , at 1:02am EDT
New Moon	Saturday, July 30 th , at 2:40pm EDT

Werner Schmidt Observatory Video Camera Report; June 21, 2011

... by Bernie Young

This article began as a report on new video cameras at the WSO, a description of how they may be used, and some answers to questions that have come up. This version is an overview of the capabilities of all our six video cameras and a call for members to learn how to use them.

WERNER SCHMIDT OBSERVATORY				
VIDEO CAMERAS				
CAMERA	MANUFACTURER	PIXEL SIZE (microns)	ARRAY	COMMENTS
STV	SBIG	7.4 x 7.4	640x400	Stand Alone or Computer Interfaced
PC164 C	SUPERCIRCUITS	15.8 x 15.8	510x492	Composite Video Sensitive Surveillance Camera
STELLACAM II	ASTROVID	8.4 x 9.8	640x480	Composite Video; Integrating; Variable Gain; Gamma
LPI	MEADE	8.0 x 8.0	640x480	Color Lunar & Planetary Imager; Computer Controlled
SSUSB	ORION	5.6 x 5.6	320x240	USB Computer Interfaced
SSVE	ORION	9.2 x 7.2	510x496	Composite Video Feed

Bernie Young, Mike Hunter, Gail Smith and Joel Burnett met at the WSO on the evening of June 20th and began exercising the two new Orion color video eyepieces.

SSVE: Solar System Video Eyepiece

We began with the Solar System Video Eyepiece (SSVE,) which provides an RCA composite video signal to a TV, VCR, Camcorder, etc. This is a simple, stand alone camera: plug it in and connect it to the "video in" of a monitor. It showed a stellar image of Arcturus. It produced a spectacular image of Saturn and one of its moons. It split the two stars of the Albireo pair (35 arc seconds) at magnitude 3.1 & 5.1, and captured 70 Ursae Majoris, a magnitude 5.5 star. It could not rein in the M40 pair at magnitude 10.1 & 9.4. Working backward, we could not get the magnitude 7.1 star 40 Ursae Majoris. So it seems somewhere around magnitude 6 is its limit. [Ursa Major is a good place to find stars with a range of magnitudes for use in checking the performance of cameras or seeing conditions on any evening. Much of this circumpolar constellation is viewable all year.]

This performance of the SSVE is good considering this is a solar system/terrestrial imaging camera. It is well suited to displaying sunspots (with the appropriate solar filter on the telescope), the moon (including occultations of stars brighter than mag 5.5), Venus, Mars, Jupiter, and Saturn, on a TV for several star party patrons to view simultaneously.

The SSVE seems less noisy than the more sensitive PC164 C B&W video surveillance camera popular with occultation astronomers. The latter is also a “plug and go” device.

LPI: the Meade Color Lunar & Planetary Imager

We have a complex computer-interfaced color video camera, the Meade Lunar & Planetary Imager (LPI) which provides more user control of the captured images. It has smaller pixels and a larger array which matches well with computer monitors. It can be used as an auto guider for astrophotography. We haven’t used this camera recently, but it seems worth spending an evening getting to know its abilities.

Stellacam and SSUSB Cameras

For the more faint objects, the Stellacam II B&W is a sensitive integrating video camera (takes a single frame or adds frames in a binary sequence to 256 frames for a 1 second exposure). It has manual gain and gamma (brightness and contrast) controls. This camera is too sensitive for solar system imaging.

The other new camera, the Solar System USB Eyepiece (SSUSB) captures color images and is controlled by a computer through a USB port. It can be used with a large flat screen display with 1280 x 960 pixels (4 times its native 320 x 240 pixel image). *This may offer a more interesting image to star party patrons.* The camera has software to process the video stream as separate images, which can be stored and played as a movie, or added with Registax software. AVI software should render the images compatible with video web casting formats or photometric analyzers like Limovie (used in occultation timing). These image-processing packages are freeware. We’ve loaded the driver and capture software and verified the signal can be captured; imaging is next on our learning curve.

SBIG STV

Finally, we have a high end SBIG STV thermoelectrically-cooled video camera that has its own controller which can be interfaced with a computer and/or used as a guider for astrophotography. Mastering the use of this camera should be a rewarding project.

The table of specifications given above provides data which will allow image scale and field of view to be computed for any of our telescopes.

All these cameras have a place in our operations. What is really needed is people who are willing to learn to use these cameras. Interested persons are encouraged to talk to Mike or me about getting complete manuals and scheduling an operating session at the observatory.

Stories and Resources of Interest from June issues of *S&T* and *Astronomy*:

- **Having Trouble Collimating your Reflector Scope?** See a very helpful article on making sure the problem is not in the misalignment of the secondary mirror. July *S&T*, page 70.
- **How to Make an Earth-based Telescope see as Clearly as a Space-based One:** See the informative article on Adaptive Optics beginning on page 26 in July’s *Astronomy*.

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) "One Minute Astronomer" <http://www.oneminuteastronomer.com/>

5) Here is the web address for Astronomy Magazine's online "The Sky This Month" online for July: http://www.astronomy.com/en/News-Observing/Sky_this_Month/2011/05/Happy_birthday_Neptune.aspx

6) How we found out about the upcoming flight of Dan Burbank: After an initial exchange of emails, Dan requested that Tom Leach send him t-shirts, ball caps, etc. bearing the logo of his (Dan's) "favorite astronomical society) in time for them to get in an earlier cargo shipment to the ISS. Amazing. Maybe we'll see our logo on TV from the ISS later this year! Tom has complied with the request and sent copies of some of their email exchanges to *First Light*. Thank you, Tom. ...and thank you, Dan! ...especially for letting us enjoy thinking about you continuing the "shuttle" era, even if now you must shuttle on a Soyuz!