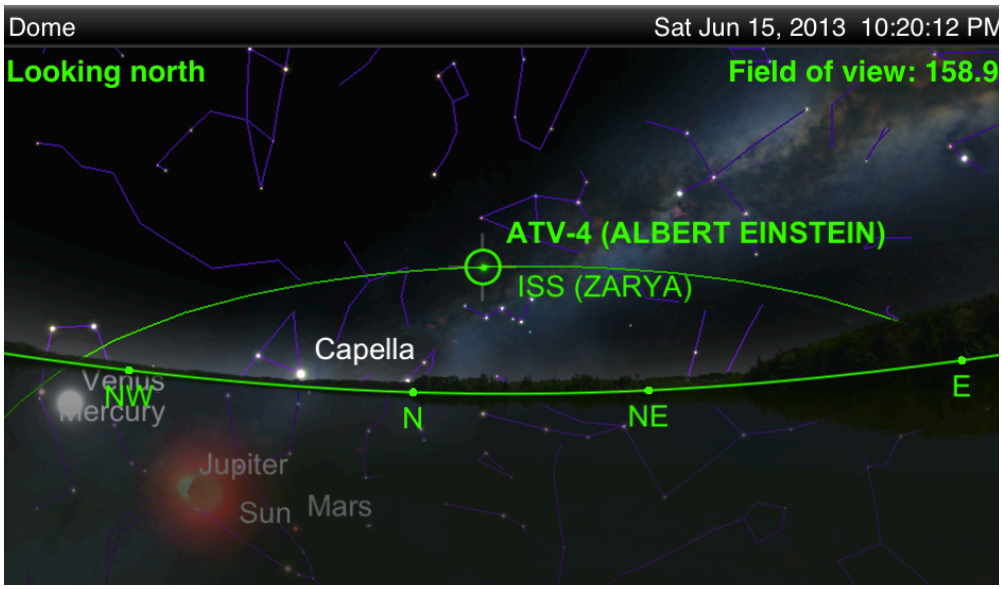
First Light

The Newsletter of the Cape Cod Astronomical Society

July, 2013 **Vol.24 No. 7**

Why can't we see ATV-4 ? .....



This was a mystery at our Star Party on June 15. Please see our story beginning page 4 to learn about the "disappearing" satellite.

Next Monthly Meeting: is Thursday, July 11th, at 7:30pm. Please note the date; no meeting on July 4th!! Don't miss Larry Marschall, Professor of physics and science writing at Gettysburg College, presenting **"Wrong Way Planets and Other Strange Solar Systems".** Public welcome. Please join us.

Reminder: The 2013 Dues Cycle begins July 1. Please bring your check to the 7/11 meeting or mail to CCAS, 34 Ridgewood Rd. Orleans MA 02653.

Reminder: Summer weekly Thursday evening Star Parties began on June 20th. The first such event in July will take place on Thursday, July 18 at 8:30pm (No Star Party on July 4th (Holiday) or July 11th (CCAS meeting.) Please see page 3 and our website "Star Party and Activities Info" for more information.

In this issue: "Disappearing Satellite" / New Member / Visitors to View Sun / CCAS Election / New Dues Cycle Begins / Summer Star Party Season / Southern Aquarids / Hebe / Cheap Telescope.

Bright New Stars:

We are pleased to welcome Alan Goodman of Newton to membership in the Cape Cod Astronomical Society. Alan's joining took place in a way we have not seen before: his son, Jeff, knowing Alan has had a longtime interest in the night sky, gave his dad a membership as a Father's Day gift. Good idea, Jeff!

Jeff said of Alan, "Decades of casual interest and curiosity in constellations; he used to take me and my sister outside to point out easy-to-spot constellations (Orion, dippers, etc). Never owned a telescope."

Alan, we look forward to meeting you at an upcoming meeting or Star Party and hope you can become active as you transition into retirement.

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).

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

CCAS News Items and Current Events:

D-Y Eighth Grade Students to View the Sun using our Coronado Sun Scope at the WSO June 19-21, 2013:

Although this event will have taken place by the time many of you read this, we are very pleased to announce that, clear skies permitting, Bernie Young will have led five groups of about 20 students each in viewing our sun through our Coronado Solarmax II60 Hydrogen α solar scope at the Werner Schmidt Observatory in groups as follows the week of June 17: one group Wednesday afternoon, two groups Thursday morning, and two groups Friday morning. Bernie and Joel Burnett continue to excel in introducing youngsters to both our day sky and night sky. Thank you, gentlemen!

The Coronado scope, donated to the Observatory by Werner Schmidt, allows visualization of texture in the sun and edge features such as solar prominences.

Would *you* like to view the sun through this scope? See notice in "From the Dome" on page 3.

The 2013 CCAS election of Officers took place at our June 6th meeting. The existing slate of officers, Mike Hunter, President, Stan Rivers, VP, Charlie Burke, Secretary, and Peter Kurtz, Treasurer, agreed to serve another year and were voted in at the meeting

Reminder: the 2013-2014 dues cycle begins July 1, 2013. Please bring your check to the 7/11 meeting or mail to CCAS, 34 Ridgewood Rd. Orleans MA 02653.

CCAS Meetings:

Many thanks to Dr. Hans Moritz Günther, a postdoc at the Harvard-Smithsonian Center for Astrophysics, for his presentation **"Star and Planet Formation and How We Found Out What We Know Today"** at our June meeting. Dr. Günther is an observational astronomer and has concentrated his efforts on the formation of stars. He described the stellar life cycle from the birth of stars from gas clouds to their eventual, often spectacular death. When a sufficient quantity of dust and other materials are present, gravity takes over and starts to condense the materials. As gravity works, the materials heat up over a period of a few thousand years. This stage forms proto stars which eventually are surrounded by a disk of cooler dust. These disks can be the size of our solar system. The formation of stars is examined by monitoring light curves and light spectra.

Mark your calendars: Larry Marschall, Professor of physics associated with Gettysburg College, will speak on **"Wrong Way Planets and Other Strange Solar Systems"** at our meeting on July 11th. Professor Marschall is the author of two books on astronomy: *GALILEO'S NEW UNIVERSE* and *PLUTO CONFIDENTIAL* and has taught courses in astronomy, physics, and science writing at Gettysburg. Whatever Dr. Marschall brings to CCAS is always interesting and informative.

Dr. Colin Bischoff, also a post-doctoral fellow at the Harvard-Smithsonian Center for Astrophysics, will speak on "**Observing the Origin of the Universe from the South Pole**" at our meeting on August 1st. Colin received a PhD in physics from the University of Chicago in 2010, with advisor Bruce Winstein, for work on QUIET, a Cosmic Microwave Background polarization experiment based in the Atacama desert of Chile. He currently works at HSCfA on studies of the universe primarily with the Keck Array microwave polarimeter, which operates at the South Pole. At our meeting, he will present this work and its contributions to our understanding of the origins of the universe.

Tim Barker, Professor of Astronomy at Wheaton College will speak on "**The Use of Filters in Visual and Photographic Observations**" at our September meeting. More information in the next *First Light.*

Thanks to Mike Hunter, our Program Chair, for lining up these special topics and speakers; we also thank Hans,

Professor.Marschall, Colin, and Professor Barker for agreeing to present.

Program planning is in progress to confirm speakers and topics for our meetings in October and thereafter.

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 Mike. For sure he will follow up.

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

Minutes:

The minutes of our April meeting are on our website; click on the "Minutes" button at www.ccas.ws or go to http://www.ccas.ws/minutes/ccasminutes060613.pdf

From the Dome:

Summer Star Parties begin Thursday, June 20th, at 8:30pm and continue every Thursday until end August except July 4th and CCAS Meetings' Thursdays: July 11th and August 1st.

Please note our July meeting is July 11.

WANT TO OBSERVE OUR LOCAL STAR?

Bernie Young has informed *First Light* that from now through the end of July, he will have our Solar Telescope set up out on the lawn at 7pm before our evening star parties. If you'd like to see the sun through this great scope, here's your chance; come before the sun goes behind the trees.

As always, "Private" group or individual observing sessions at the Werner Schmidt Observatory may be scheduled by contacting Observatory Director Joel Burnett at Joelburnett@comcast.net 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. If you wish to borrow one of these 'scopes, contact info@ccas.ws

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July Observing:

Please see resources at *Astronomy Magazine*, June, pp 36-43 and *Sky and Telescope*, May, pp 38-58, and Reference 5 for good guides to the July sky.

Mooncusser's Almanac and Monthly Alert[1]
JULY 2013

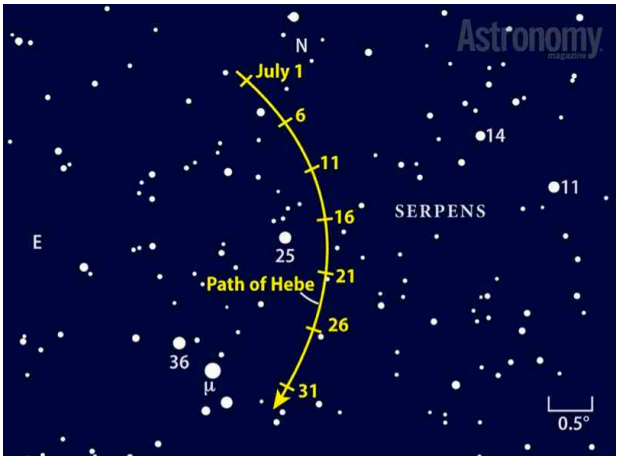
Object	July 1 (EDT)	July 15 (EDT)	July 30 (EDT)
Sun	R: 05:10 S: 20:19	05:19 20:13	05:34 19:59
Moon	R: 00:53 S: 14:23	12:44 23:40	00:43 15:07
Mercury (predawn)	R: 06:22 S: 20:46	04:56 19:16	04:03 18:46
Venus (evening)	R: 07:09 S: 21:53	07:42 21:46	08:20 21:29
Mars (predawn)	R: 03:50 S: 19:01	03:35 18:49	03:20 18:31
Jupiter (predawn)	R: 04:32 S: 19:40	03:51 18:58	03:04 18:10
Saturn (until wee hours)	R: 14:50 S: 01:39	13:55 00:44	12:54 23:41
Uranus (after midnite)	R: 00:29 S: 13:06	23:34 12:11	22:31 11:08
Neptune (after 9pm)	R: 23:03 S: 09:56	22:07 09:00	21:03 07:55
Pluto (evening)	R: 19:55 S: 05:34	18:58 04:37	17:54 03:32

Observing Highlights for the Month:

- **Saturn** doesn't set until around midnight local daylight time during July, which provides observers with telescopes several prime viewing hours each clear night. The planet's disk measures 17" across in mid-July, when the ring system spans 39" and tips 17° to our line of sight. Look for main moons Tethys, Dione and Rhea and dimmer Enceladus near the planet and the more distant giant Titan far north east or south of the planet depending on the observation date. This season, because Titan's orbit is eccentric, the big moon is much farther away when east of the planet than when west.
- If you don't mind getting up before dawn, enjoy the peak of the **Southern Delta Aquarid**

meteors on July 30; you may see up to 10 meteors per hour

Mag 9.5 asteroid Hebe is nicely placed for evening viewing about 35º altitude in Serpens; as the finder chart (from *Astronomy Magazine)* shows, Hebe moves significantly toward the south from night to night this month.

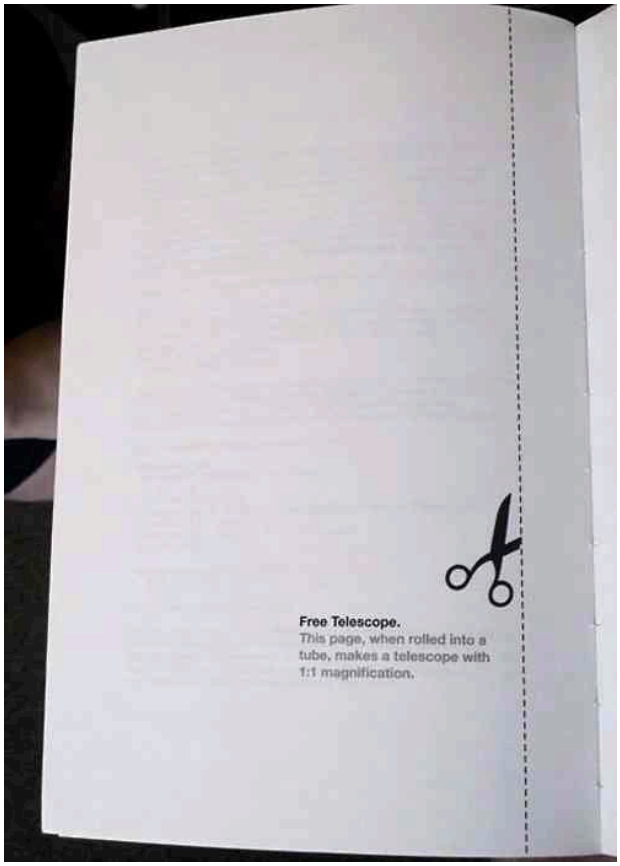


Anyone having an interest in monthly **Libration and Declination Tables for the Moon**[2] during this month please contact your editor for information or sources.

Moon Phases, July, 2013

New Moon Monday, July 8th at 3:14am EDT
First QTR Monday, July 15th at 11:18pm EDT
Full Moon Monday, July 22nd at 2:16pm EDT
Note: Perigee on July 21st: High Tides!
Last QTR Monday, July 29th at 1:43pm EDT

Interested in a Telescope Having Great Optics at the Absolutely Lowest Possible Price?



The caption says, "Free Telescope. This page, when rolled into a tube, makes a telescope with 1:1 magnification."!!!! Thanks to member Tom Engle for sending this idea in to us.

Why can't we see ATV-4 ?

This was a mystery at our Star Party on June 15.

By Peter Kurtz

One of the fascinating aspects of dabbling in amateur astronomy is that each planned observation is an exercise in the scientific method: pose a theory (hypothesis) , make observations pertinent to the testing of the theory, conclude that the observations support or do not support the theory, post a modified theory, etc.

Whenever we plan and execute an observation of the night sky, we pose a theory, "Sky target X will be present at position Y in the sky at time Z from observing position Q." When we find X where we expected to find it, we make an observation that confirms the theory.

Well, what are we to learn if when we make the observation, we don't find what we expected? Assuming the mechanics of our observing are reliable (e.g., no cloud cover, etc.) if we don't find what is expected, the chances are that what we expected to see (i.e., the theory!) is incorrect.

At our Star Party Saturday night, June 15th, we had a most amusing demonstration of an expectation gone awry, the need to pose alternative ideas (hypotheses) , and make followup observations to support the alternative idea.

OK. During the afternoon preceding our star party, I was exploring my new satellite simulation app, Satellite Safari, on my iPhone. (See http://www.southernstars.com/products/satellite_safari/index.html for information on this excellent software.) A feature of Satellite Safari is the capability to examine a listing of "Tonight's Visual Satellites". I noticed when perusing the list for Saturday, July 15th at the location of the Werner Schmidt Observatory, that one target for the evening was a satellite named ATV-4 (Albert Einstein.) I asked to see its magnitude and skypath for that evening and it was predicted to come up out of the northwestern horizon at about 10:15pm at magnitude 2.8 and traverse a path up to some 40º in altitude above the horizon to eventually set north of east about 10:22pm. While watching the simulation on the screen, I "discovered" that when ATV-4 was about one quarter of its path from left to right across the sky, the ISS (International Space Station, magnitude -0.6) appeared out of the earth's shadow *on the same path* ATV-4 was following and the ISS was to follow ATV-4 all the way to the setting point in the northeast.

OK. I did just a little research and found that ATV-4 was a Europe-sponsored Automated Transfer Vehicle launched on an Ariane V rocket ten days earlier from French Guiana on a mission to dock with and provide supplies to the ISS. It is the largest and heaviest ATV vehicle taking supplies to the ISS ever launched.

What a find! That night we would be treated to the spectacle of the not-that-bright ATV coming up from the northwest horizon followed by the brighter-than-most-stars-we-can-see ISS! We would be able to watch the two, in "formation" on the same orbit paths for almost ten minutes!

Well that's not what happened. Beginning at 10:15pm which was the earliest the simulator showed that the ATV would rise above the horizon, we watched and we watched and nothing happened. Finally at about 10:18, one fairly bright satellite appeared on the track above the trees. Having the idea that what we saw was the ATV, we watched and we watched looking for the brighter ISS to come up behind it. Didn't happen. Well we decided that maybe the ATV was too dim to see and that what we were looking at was the ISS itself. We watched it until about 10:25 until it had disappeared in the east-northeast.

Fun. But frustrating because what we expected to see didn't happen. So what did we really see? What was going on?

I did some research online on Sunday, the day after our Star Party. Well, guess what I discovered? The reason we saw only "one" satellite cross the sky Saturday night was that the ATV freighter *had already docked* with the ISS at 2:07pm GMT Saturday, 6/15, 10:07*am* EDT Saturday *morning* . In fact, when I re-ran the simulation on Satellite Safari Sunday afternoon, (the database had been updated) it showed the ATV and ISS superimposed on each other as shown in my image on page 1 of this *First Light!*

It turns out that my simulator, Satellite Safari, automatically updates all its satellite information *only once a day* unless you overtly ask it to update "now". So the simulation I looked at in my afternoon planning session and the simulation we looked at in the field Saturday night "did not know" that the ATV had docked. The observation said "one satellite" even though we were looking for two. But by Sunday afternoon, the simulator had updated its database and showed the two superimposed moving across the sky.

Well it's good to be right "most of the time". And when you're not, you learn something. Isn't our hobby fun!!!!

Please see the NASA story on docking of ATV-4 at 2:07pm GMT Saturday 6/15 (10:07am Saturday EDT at: http://www.nasaspaceflight.com/2013/06/atv-4-dock-iss-following-ten-day-free-flight/

See also the following reference for the complete story on the ATV launch: http://www.nasaspaceflight.com/2013/06/europes-atv-heavy-hauler-penultimate-launch-iss/

It's interesting to note that because of the volume of goods to be unloaded from the ATV and the volume of trash to be offloaded, it is expected that the ATV will remain docked with the ISS for several months. We all should remain vigilant to find out when the undocking will take place. Maybe we can see them fly in formation after undocking in the fall.

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.

5) Here is the web address for Astronomy Magazine's online "The Sky This Month" online for July:
http://www.astronomy.com/News-Observing/Sky%20this%20Month/2013/05/A%20pair%20of%20close%20encounters.aspx
See also S&T resources online at http://www.skyandtelescope.com/

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 :
for Saturn's moons: http://www.skyandtelescope.com/observing/objects/planets/3308506.html