



First Light

The Newsletter of the Cape Cod Astronomical Society



May, 2010

Vol.21 No. 5

- **Next Monthly Meeting:** is Thursday, May 6th at the DY Library. Program notes below. If we are blessed with a clear night, and interest is sufficient, observing from the Schmidt will follow the meeting. Please see the moving banner and the tail of the rocket on our website's home page for upcoming speakers and topics.
- **Star Parties** open to all members and the public will resume on Thursdays in June, 2010. See the story on page 1 of last month's First Light or consult the "Green Box" on our website for further information. Contact info@ccas.ws or Mike Hunter, Observatory Director, if you wish to set up a special Star Party for your group during the winter or spring months. MEMBERS, particularly newly joined: we would like to provide you an opportunity to observe. If you would like to schedule an evening at the Schmidt, contact us and we will try to schedule something for you soon.
- **Feature Articles this month:**
 - Dim Variable Star Suddenly Brightens 100-fold!
 - Galaxy Zoo: Where You can Participate in the Exploration of the Universe

Bright New Stars:

We like to welcome new members to 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).

Thank You! :

Thanks to Charlie Burke, our Secretary, for his overview of Marcia Bartusiak's special presentation at our April meeting. Extract below. Thanks to Mike Hunter for his contribution "From the Dome".

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

If you are a regular contributor, thank you very much!

CCAS Events

A special Star Party took place at the Schmidt Observatory on Saturday, April 24, National Astronomy Day. While we had hoped for patches of clear sky, none materialized. More information on this event from Mike later.

Many thanks to **Marcia Bartusiak** for her wonderful telling of the story "**The Cosmologist Left Behind**" at our meeting on April 1. Her story was a most informative and entertaining reprise of the main moments in her book *The Day We Found the Universe*. Marcia highlighted the roles of personalities and human foibles in the evolution of our understanding of the universe from the first observations of hundreds of nebulae in the 1700's and 1800's through the discovery of the spiral shape of galaxies to the rapid-fire discoveries in the early 20th century that culminated in our realization that our solar system is a tiny piece of a spiral galaxy and that our galaxy is only one of maybe trillions in an expanding universe. Marcia also illuminated, along the way, the discovery/development of key new tools such as the "standard candle" for measuring immense distances and the use of spectral shifts for understanding motions of distant bodies. Thank you so much, Marcia, for your long trip to grace us with a truly wonderful talk; your book is a must read for all of us.

At our meeting on May 6th, **Hugh Blair-Smith** will tell us "**the rest of the story**" reviewing highlight episodes in his career in building software in support of American space programs. Hugh gave us a spell-binding talk in August, "Chapter 1" on his remarkable career in "machine language" software building in support of several historic NASA programs. Hugh is back in May. Not to be missed.

On June 3rd, AAVSO member **Jim Carlson** will talk about "**Studying Variable Stars**". Jim served as CCAS Observatory Director from its inception until 2007. The

American Association of Variable Star Observers (AAVSO) provides data for basic research. Individuals are assigned personal observing codes and make daily, even hourly, reports regarding the activity of stars as they brighten and fade

At our meeting on July 1st, **Dr. Larry Marschall** will return to speak to us. Topic to be announced later. Dr. Marschall is the author of two new books on astronomy: *GALILEO'S NEW UNIVERSE* and *PLUTO CONFIDENTIAL*. Dr. Marschall is on the faculty of Gettysburg College where he teaches courses in astronomy, physics, and science writing. Educated at Cornell University (B.S., 1966) and the University of Chicago (Ph.D., 1971), he joined the Gettysburg faculty in 1971. Whatever Dr. Marschall brings to CCAS is always interesting and informative.

Thanks again to our program chairman, Tom Leach, who continues to put together great programs for our monthly meetings well into 2010. If you'd like to look ahead, go to our website and look at the gray box just below the base of the rocket; there you will see our "Speaker's Bureau": profiles on speakers and topics from now through November 4th.

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!

Astronomy Nights at Bank Street Bogs:

Join Harwich Harbormaster, Tom Leach, for a telescopic look at the night sky. "Cloudy weather cancels." Bring your own binoculars. From Harwich Center go south on Bank Street. Park in the Harbormaster Parking Lot on the left at 203 Bank St. Free.

Remaining events scheduled: 9:30pm on Thursday, May 13, Tuesday, May 18, and Thursday, May 20.

The minutes of our April meeting prepared by Charlie Burke, our Secretary, are on our website; click on on the "Minutes" button at www.ccas.ws or go to <http://www.ccas.ws/minutes/ccasminutes040110.pdf>

Executive Corner

The Executive Board exchanges ideas by email and phone on a continuous basis and now and then formally convenes by conference call. Anyone wishing to offer an item to the

agenda, please contact Tom, Paul, Peter or Charlie.

All Members please be sure your dues are current!

Please make your payment either by bringing to a meeting or mailing directly to CCAS at PO Box 297 Harwich Port MA 02646. Thank you. .

Foundation News...

From the Dome...

Despite the record rainfall in parts of eastern Massachusetts, the Cape has had a fair number of clear nights over the past month. They just didn't coincide with our planned events. That included the National Astronomy Day star party on April 24. Five minutes of viewing the moon through thin clouds was all we saw. Attendance, however, was decent, considering the weather, seven staff and five visitors.

The two and one half hours at The Schmidt were not wasted. Besides showing our guests the observatory and scopes, discussing astronomy in general, and renewing old acquaintances and making new ones; we got in some more reps on scope startup procedures, made adjustments on scopes, and checked out the new eyepieces.

New eyepieces? That's right. The Foundation bought a 13mm Nagler Type 6 for the 16" and a 12mm illuminated crosshair unit for the 18". The Society bought a 17mm Nagler Type 4 for the 18". The 16" is now equipped with 13mm and 20mm Naglers and an illuminated crosshair alignment eyepiece while the 18" has 9mm, 17mm, and 35mm Naglers and an illuminated crosshair alignment eyepiece. The illuminated crosshair eyepieces are used to obtain more precise scope alignments and thus better GO TO's. The 2" eyepieces "dedicated" now to each scope can be switched out in special instances when more or less magnification or field size is needed for specific targets.

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! 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. If you wish to borrow one of these 'scopes, contact info@ccas.ws

May Observing:

THE SUN:

After several years of **the sun** being at a very boring "solar minimum", sunspot and flare (prominence) activity returned in March. If you have a solar scope or proper sun filters for your telescopes, sun activity observing "season" is back. ⁷

A COMET:

It's been a while since we had a reasonably bright comet to study in the evening. See if you can spot 10th magnitude Comet 81P/Wild above i-Virgo. It will be at coordinates 14 06 15, -04 45 53 on May 1, 2.5° above and west of i-Virgo, proceeds west for about 10 days, makes a turn down and back east to arrive at 14 05 55, -06 06 27 by end month.

PLANETS:

- **Mercury** can be glimpsed in the east at dawn before sunrise the last weeks of May.
- **Venus** is available in the western sky all month: provides interesting vistas and photo ops with the new crescent moon mid month but is not a "wow" telescope target until later this year. The following table shows that while it is bright and certainly visible now, it acquires much more character as a telescope target as it catches up to earth in its inside track orbit during the summer. As it catches earth, overall its magnitude doesn't change much but it becomes much larger, first "half" and then "only crescent" lit. Watch the change over time from now thru fall.

Venus May thru October			
Date	magnitude	% of surface lit	Angular Size(")
5/1	-3.9	89%	12"
5/31	-4.0	81%	13"
7/1	-4.1	70%	16"
8/16	-4.3	50%	47"
10/4*	-4.5	16%	48"

- inferior conjunction is October 28.

Note for people who might be travelling: The 2 day old crescent moon will *ocult* Venus at 10:00UT on Sunday, May 16; visible only in North Africa, Turkey, Middle East, and parts of Asia.

- Nicely positioned **Mars** is getting smaller this month.
- **Saturn** continues to star. It is visible nearly until dawn most of the month. As was true last month, *now* is the time to study Saturn's moons. Consult a Saturn moon chart (reference 6) to see where the main moons will be at any date, at any time.

ASTEROIDS:

Magnitude 6 **Vesta** continues its rampage in Leo all this month and well into June. Please see last month's First Light for the story, a finder chart and reference information. Your editor has been regularly observing Vesta since mid

March. A review of this multi-month observing experience will be presented in First Light later this year with plots showing exact locations against key background stars for all observations over several months.

Mooncusser's Almanac and Monthly Alert¹

By Peter Kurtz

MAY, 2010

Object	May 1 (DST)	May 15 (DST)	May 31 (DST)
Sun	R 05:36 S: 19:38	05:20 19:53	05:09 20:07
Moon	R: 23:04 S: 07:54	06:29 21:51	23:04 08:40
Mercury (sun;dawn)	R: 05:24 S: 19:11	04:36 17:53	04:09 17:56
Venus (evening)	R: 06:56 S: 21:57	07:03 22:25	07:25 22:45
Mars (evening)	R: 11:51 S: 02:20	11:28 01:40	11:06 00:56
Jupiter (predawn)	R: 03:50 S: 15:33	03:01 14:51	02:04 14:01
Saturn (all nite)	R: 15:47 S: 04:14	14:49 03:18	13:45 02:14
Uranus (predawn)	R: 04:00 S: 15:59	03:06 15:07	02:04 14:06
Neptune (midnite)	R: 02:46 S: 13:23	01:52 12:29	00:49 11:26
Pluto (midnite)	R: 23:28 S: 09:20	22:32 08:24	21:27 07:19

METEOR SHOWER:

As the earth passes through debris left from Halley's comet before dawn on May 6 (and, to a lesser degree anytime three days on either side of this date and time) the **Eta Aquarid meteor shower** can be observed. A near quarter moon near the radiant before dawn on May 6 will take something away from the opportunity. *But, earth passes through the debris for seven days; so keep your eye to the sky: you WILL see meteors during this period.*

MOON KISSES STAR CLUSTER:

A two day old crescent moon passes 0.04° from the outer edges of the open star cluster M35 at the foot of Castor the evening of Sunday, May 16: a likely photo op.

DEEP SKY IN THE LION:

With the constellation Leo near to overhead at evening viewing time in May, mention must be made of the deep sky targets asking to be viewed.

If this photo⁸ doesn't get you looking for three spiral galaxies with companion star in Leo with either binoculars, a small scope, or (to see the spirals) a larger telescope, nothing will.



This spectacular group, three mag 9 spirals: M65, M66 (at bottom,) and NGC 3623 and a complementary mag 7 star should be nicely visible on any dark clear night in May.

An equal opportunity exists elsewhere in Leo. For both smaller telescopes (4") and larger telescopes (8" and up) these *five* galaxies live inside a 2° field in Leo:⁹ M95 is a mag 10 spiral 7'x4'; 0.6° above and east M96 is a mag 9 spiral 9'x6'; about 1° above in a 0.5° field are the trio NGC3384 (elliptical), M105 (elliptical) and NGC 3389 (spiral). M96 is one of the brightest galaxies in the sky. See if you can spot all five in a small telescope or larger binoculars.

Once again, all of us have access to excellent summaries of interesting sky objects to be seen in the upcoming month in the print editions of both Astronomy Magazine and Sky & Telescope. The websites for both magazines also offer a wealth of information on "what's in the sky this month".^{4,5} Both outfits also offer weekly or monthly email newsletters to help you keep abreast of what's happening. Look also on the CCAS website for other good observing guides.

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.

Astro Question of the Month:

If a fellow citizen asked you, could you define the difference in meaning between the words *Astronomy* and *Cosmology*? See note 10 on page 6 for the answer.

Moon Phases, May, 2010

Last QTR	Thursday, May 6 th at 12:15am DST
New Moon	Thursday, May 13 th at 9:04pm DST
First QTR	Thursday, May 20 th at 7:43pm DST
Full Moon	Thursday, May 27 th at 7:07pm DST

OF GENERAL INTEREST:

WATCH A SHUTTLE LAUNCH FROM CHATHAM LIGHT:
 A "friend of CCAS" sent an email recently reminding us all that night launches from Cape Kennedy in Florida can be seen from the Chatham Light parking lot. He reports he has seen two space shuttle launches and one other rocket. Your editor remembers a conversation some time ago with Ed Swiniarski in which Ed reported you can see such launches from Cape Cod beaches. Something to keep in mind. Watching that streak in the sky from nearly 1000 miles away must be a special treat.

WOULD YOU LIKE TO REALLY UNDERSTAND HOW DISTANCES TO GALAXIES IS DETERMINED FROM "RED SHIFT"?

The May issue of Astronomy Magazine, p 56, has a fascinating little article explaining how recent images from the Hubble Telescope's "new" Wide Field Camera 3 have "discovered" galaxies deeper in space than ever before, some a primordial 13.1 billion ly away. Such galaxies are sending light to us that left them only 0.6 billion years after the Big Bang. Wow. There is bonus information: the article has two sidebars which very nicely explain in simple terms how we can determine the distance to such galaxies through analysis of the "red shift" of light to longer wave lengths; a good review of how it works!

In the same issue, pp.62 and 63, are short clips explaining how neutron capture in high energy environments like a supernova can create elements heavier than iron and also how gravitational lensing causes distortions of light from more distant objects; the images are not just "distorted objects".

Got Any Local Photos Showing Light Pollution or “Good” Lighting?

Reminder: Please think about the opportunity to take photos documenting light pollution or “good” lighting as requested in last month’s story “Local astronomers Aim to Limit Light Pollution”. Tom Leach, our President, is working on a video portrait on the local light pollution situation¹¹. Once again, Tom requests that *All interested persons send him photos which might be useful in this video story; again, local photos of GOOD light situations and, more importantly, BAD light situations. Please notify Tom directly if you have photos or let us know at info@ccas.ws*. Thank you.

Feature Articles:

Dim Variable Star Suddenly Brightens 100-fold!¹²

v407 Cygni used to be a rather mundane variable star, known only to small elite of variable-star observers, and typically ranged in brightness between 12th and 14th magnitude. But in early March it seized the attention when Japanese amateurs K. Nishiyama and F. Kabashima, nova hunters working the galactic plane, announced finding on March 11 what appeared to an 8th-magnitude nova near Deneb in Cygnus. So a normally mag 12 to 14 variable has erupted to be, as of March 11, mag 8!

See if you can find v407 in Cygnus. Cygnus is low in the evening sky in May but soon will be well placed for this search. Use the star chart¹³ published by the American Association of Variable Star Observers, AAVSO; v407 sits at RA 21^h 2^m 10^s and declination +45° 46.6'. If you think you found it, estimate its brightness using the comparison stars on the AAVSO chart: magnitudes of nearby stars are shown on the chart. Finally, check out the story in Sky and Telescope online¹² to learn that v407 is a *symbiotic variable* star, the mechanics of how such systems normally vary in brightness, and how certain symbiotic variables, including maybe v407, might suddenly increase in brightness by 100-fold. v407 may stay unusually bright for months or *it could be already dimming* by the time you read this or find an opportunity to look for it. A large amount of circumstellar material is likely in and around the system and an expanding debris shell from a component’s eruption can strike this material violently, likely producing many variable phenomena.

Galaxy Zoo¹⁴: Where You can Participate in the Exploration of the Universe

by Peter Kurtz

Would you like to participate in discovering new things about the cosmos? Certainly the story in last month’s First Light about young Kelsie Krafton discovering asteroids suggests: “Could I be doing something like that?” You can. Try Galaxy Zoo!

Galaxy Zoo is an online astronomy project, which invites members of the public to assist in classifying over a million galaxies. An opportunity to practice “citizen science”, it enlists the help of members of the public to help in scientific research. An improved version, Galaxy Zoo 2, went live on 17 February 2009.

[The project is inspired by Stardust@home¹⁵, an initiative in which NASA asked the public to search images obtained from a mission to a comet for the presence of particles on collection plates.]

Galaxy Zoo is a collaboration among researchers at many institutions, including Oxford University, Portsmouth University, Nottingham University, Johns Hopkins University, Yale University, University of California, Berkeley and Fingerprint Digital Media, Belfast.

Computer programs are so far unable to reliably classify galaxies in new images from sky surveys. According to a member of the team behind the project, Kevin Schawinski, "The human brain is actually much better than a computer at these pattern-recognition tasks. "Without human volunteers, it would take researchers years to process the photographs, but it is estimated that with as few as 10,000 to 20,000 people giving up time to classify the galaxies, the process could be complete in one month.

No knowledge of astronomy is required. In the site's tutorial, would-be volunteers are shown spirals, ellipticals etc., and can try guessing before being shown the correct answer. Also shown are pictures of stars and satellite trails, which the robot telescope has recorded without being able to classify them. Volunteers are then tested on some additional pictures and signed up if they get

a reasonable number of correct results.

Galaxy Zoo examines files containing images of almost a quarter of a million galaxies recorded by the Sloan Digital Sky Survey, a camera attached to a robotic telescope. More than 150,000 people have taken part in Galaxy Zoo so far, producing a wealth of valuable data and sending telescopes on Earth and in space chasing after their determinations. Zoo 2 focuses on the nearest, brightest and most beautiful galaxies. Check out the reference to find out how it works, learn how to take part, and learn what Galaxy Zoo has achieved to date.

Coming Soon:

If more pressing matters do not intervene, we hope to bring you the following story promised earlier:

Most of us know that Mizar, one of the double star system Mizar-Alcor in Ursa Major, is itself a double system. There is also an unrelated field star named Sidus Ludoviciana that lurks nearby. New study has found that *Alcor* is not a single but in fact also has a partner. Next month we will review current study which uses an ancient technique Galileo used to determine that the newcomer is indeed part of the Alcor/Mizar system rather than merely an unrelated far distant star that only “looks” nearby.

**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**

Notes and References continued from page 7

9) M96 spiral and nearby companions: <http://www.astronomy.com/asy/default.aspx?c=a&id=9720>
<http://www.astronomy.com/asy/default.aspx?c=a&id=9730> and [=9748](http://www.astronomy.com/asy/default.aspx?c=a&id=9748)

10) ...from Ask Astro, a regular feature in *Astronomy Magazine*:

What is the difference in meaning of the words astronomy and cosmology? The answer:

Astronomy is one of the oldest sciences and deals with the properties of celestial bodies. Astrophysics is a more modern science which deals with the physical properties and dynamic processes of celestial objects.

Cosmology is a branch of astrophysics which deals with the greater workings of the universe: origins, evolution, and large scale structures.

11) <http://www.youtube.com/watch?v=AkwLyD1YKzM>

12) <http://www.skyandtelescope.com/observing/highlights/88951267.html>

13) <http://mira.aavso.org/cgi-bin/vsp.pl?action=render&name=v407+Cyg&ra=&dec=&chartitle=&chartcomment=&aavsoscale=Choose&fov=60&resolution=100&maglimit=13&north=up&east=left&othervars=&chartid=&Submit=Plot+Chart>

14) <http://www.galaxyzoo.org/>

15) http://www.planetary.org/programs/projects/innovative_technologies/stardustathome/stardustathome_story.html

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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.



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) *Astronomy Magazine's* online The Sky This Month online feature; you can access this month and past months; <http://www.astronomy.com/asy/default.aspx?c=ss&id=84>
- 5) Current week's *Sky and Telescope* "Sky at a Glance" <http://www.skyandtelescope.com/observing/ataglance>
- 6) There is a special story on Saturn's "Amateur" Moons beginning on page 61 of the May *S & T* magazine. Full charts for Saturn's main moons in May are given on on page 62. **ALL DATES AND TIMES UTILITY FOR SATURN'S MOONS:** <http://www.skyandtelescope.com/observing/objects/planets/3308506.html>
- 7) <http://www.skyandtelescope.com/community/skyblog/observingblog/88604077.html>
- 8) M65, M66 and companions: <http://www.flickr.com/photos/zio81/4314412953/>

References and Notes continued on page 6