First Light

The Newsletter of the Cape Cod Astronomical Society

March, 2011 **Vol.22 No. 3**

Our finite time on Earth means we must cherish uncommon celestial events. …

…When I discussed Saturn's 29½-year cycle with my friend, he fell oddly silent, and then quietly said, "I'll never again see Saturn like this." (observing tilt of Saturn with northern hemisphere "on top", rings wide open, in the late 1980's.)

… Amazing ε-Aurigae stands bright for 25 years, then, as if on cue from some mystical stage manager, dims one magnitude over about six months, sits dim for about six, and then rebrightens in about six. Right now we are watching the brief rebrightening stage. Are you young enough to see the next ε-Aurigae dimming cycle 27 years from now? The next cycle for dimming of ε-Aurigae begins in 2036!

…Like Venus transiting across the Sun. After the June 5 event in 2012, you'll have to wait more than a century to see the phenomenon again.

…How about a really spectacular meteor storm? On November 18, 1966, the annual fall Leonid storm displayed more than 60 meteors per second! Second place went to the Leonids, again, on November 18, 2001; that's when the storm gave five brilliant green streakers per minute, all with lingering trails like cheshire-cat smiles, thrilling pre-dawn onlookers for hours. The next? Don't ask. You might have to wait until 2099. Will you be here for the next really spectacular meteor shower?

…How about solar eclipses? Will you be here for the coast-to-coast event in August, 2017? The south to north east-central US shadow path in 2024? Or maybe you might try to wait until 2045!

… or a reall.y really good comet? We had Bennett in 1970, West in '76, Hyakutake and Hale-Bopp in 1996 and 1997, respectivel. There will be a return of Halley in 2061. Will that work for you?

There is a moral to this story. Grand events in the sky take place only at points in time determined by nature. We need to be ready for them, they will not wait for us. Be thankful for the grand phenomena you have seen and treasure the ones you may yet see. Even little ones. Maybe this is the year to sit and really study the Great Orion Nebula before its season ends.

The night sky indeed specializes in provoking musings on mortality.

…these ideas inspired by and extracted from an article by Bob Berman, a contributing editor of *Astronomy* magazine.[4]
Please see more on the 2011 phenomenon of rebrightening of ε-Aurigae in Note 5.

- **Next Monthly Meeting:** is Thursday, March 3rd at the D-Y Library. Our own Bernie Young will present "Occultational Astronomy": techniques for and an overview of the opportunity to see events few have seen and to contribute to world-wide efforts to precise our knowledge of the movement of heavenly bodies. (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.)

- The last scheduled Star Party for this season took place in October. Sometimes emails will be sent out to alert members to special opportunities coming up at the Dome. 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 and to learn. If you would like to spend an evening at The Schmidt, contact us and we will try to schedule.

- In this issue: Harwich Observatory has a website! / Dark Skies Initiative / Youth Outreach / March Observing / Observing "Down Under" / A great Guide's New Resource aiding Lunar Observing.

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).

Thanks to Cillia Houghton for permission to report on her visit to CCAS this month, to Larry Brookhart for the notice about his observatory's website, to Tom Leach for the notice about the night sky quality initiative, and to Mike Hunter for his note on observing "Down Under"

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

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

CCAS Events

Many thanks to Paul Blackmore for his presentation at our February meeting: **"Celestial Landscape Photography"**. The lecture featured practical ways for amateur photographers and astronomers to capture the night sky with digital cameras using conventional lenses. Star trails are always a great subject for photography, and Paul gave us several practical suggestions for this task. He showed us photos of star trails taken with 10 second exposures all the way up to 3 ½ hour exposures. Advice regarding choosing the proper aperture and reducing noise was included.

Examples of how weather and even light pollution can artistically enhance photos were shown. Photos of the night sky were shown from Cape Cod and Arizona. Also, black and white photography was discussed.

Paul is an accomplished photojournalist. He spent several years as a photographer for the *Cape Cod Times,* and now works independently in the areas of landscape, nature, and wedding photography. For more information please see his website at http://web.me.com/paulblackmore/Site_2/Home.html

In lieu of an honorarium, Paul has requested we post notices in First Light when he schedules art shows this summer. We will do so when we have the dates and locations.

At our meeting on March 3rd, Bernie Young will present **"Occultational Astronomy"**. Occultations provide an opportunity to see events few have seen and also an opportunity to contribute to world-wide efforts to precise our knowledge of the movement of heavenly bodies. Unpaid astronomers like us can contribute data to a global effort of discovery, measurement, and improved accuracy. Various upcoming events will be described. Tools for predicting the events, the common equipment used to make measurements, approaches to corroboration with other astronomers, and tools for reporting data will be discussed. Some outstanding occultation events taking place this month will be profiled. Bernie is an amateur astronomer and professional engineer and land surveyor. His interest in the sky lay dormant until three years ago when he joined CCAS and became a frequent star party participant. That led to an invitation to join the observatory staff.
Last spring he was appointed member of the Cape Cod Astronomical Foundation to serve as Director of Research and Development.

At our meeting on April 7th, optical engineer Peter Howes will present a program "**Evolution of Large Mirror Telescope Systems at the Haleakala Observatory**." The observatory stands at an altitude of 10,000 feet. Starting in 1969, the Avco Everett Research Laboratory won the management contract for the observatory and Peter was responsible for this program for over a decade. He will talk about the early days when the technologies were developmental and the evolution of large mirror systems moved from huge monoliths to the early days of compensated imaging. Because of the remarkable clarity, dryness, and stillness of the air, and its location above one-third of Earth's atmosphere, as well as the limited light pollution, the summit of Haleakala is one of the most sought-after locations in the world for ground-based telescopes.

On May 5th, Dr. Gregory Skomal will present **"Magnetic Navigation Clues in Sharks**". Greg is an accomplished marine biologist, underwater explorer, photographer, aquarist, and author. He has been a senior fisheries biologist with Massachusetts Marine Fisheries since 1987 and currently heads up the Massachusetts Shark Research Program (MSRP). Much of his current research centers on the use of acoustic telemetry, satellite-based technology, and animal-borne imaging to assess the physiological impacts of capture stress on the post-release survivorship and behavior of sharks. As of late, Dr. Skomal has headed a team tagging Great White sharks off Light House Beach and south in Chatham in an effort to understand their migratory patterns and behavior.

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 July meeting! If you would like to take a peek at what's coming up beginning in June, take a look at http://www.ccas.ws/monthlynotice.html or

look in the "tail of the rocket" on our main website page.

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 February meeting prepared by Charlie Burke, our Secretary, are on our website; click on the "Minutes" button at www.ccas.ws or go to http://www.ccas.ws/minutes/ccasminutes020311.pdf

---

High School Senior Interviews CCAS Members and Visits the Schmidt:

Barnstable High School Senior Cillea Houghton contacted CCAS by email in February asking if she could interview some members about their involvement in amateur astronomy. She chose this activity as a project for her Astronomy course under Mike Gyra at Barnstable. Cillea interviewed Tom Leach, Paul Cezanne, and Peter Kurtz and visited the Schmidt Observatory with her mother the evening of February 23rd to gather information, see our facility, look over various kinds of equipment, and participate in a short session viewing the night sky with our 16" scope. Thank you, Cillea, for your interest. Sharing the sky with young people is one of our favorite activities. Look forward to seeing you at star parties this summer.

Cillia Houghton with our 18" Dobsonian

Larry Brookhart reports that good progress is being made on preparations for the dedication of the **new Harwich Observatory** and also that the website for the observatory is up and running: <http://www.harwich.edu/observatory.html

The Harwich team is aiming for an April grand opening and ribbon-cutting ceremony and will let us know date and time.

Tom Leach requested the following appear in FL:

Would you like to participate in **a survey of "night sky quality"** by evaluating which stars you can see in the constellation Orion from *your* observing location? All you need to do is go outside and look and report the limiting magnitude for stars you can see at a central website **before March 7th** (the campaign began February 21; ends March 6th.) Let's put Cape Cod on the map; (when your send in your report, a "pin" appears on a world-wide map noting the location from which you make your report and, when you click, shows your data.)

Here is a link to the "Globe at Night", the dark skies initiative that we talked about at our last meeting. Please forward this to anyone who you think might wish to participate.

Globe at Night: http://www.globeatnight.org/

Please see Note 6 for more information.

Executive Corner

Members of The Executive Board exchange ideas by email and phone on a continuous basis and now and then formally convene by conference call. Anyone wishing to offer an item to the agenda, please contact Tom, Paul, Peter or Charlie.

From the Foundation… and Dome…

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

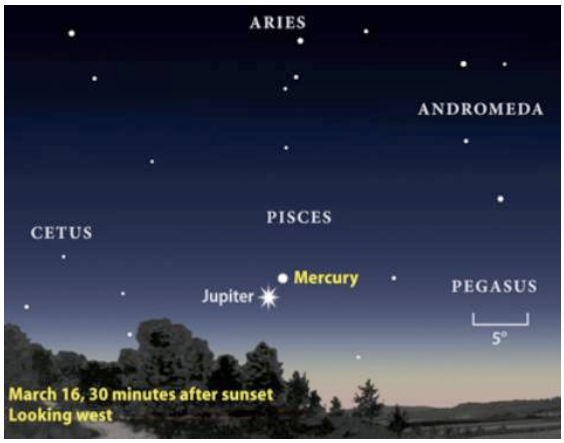
Our Society exists to promote observing! Help us promote this objective by asking for time at the Dome!

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

March Observing:

Earth's **vernal equinox** occurs at 7:21 p.m. EDT, March 20th. This marks the instant when the Sun crosses the celestial equator traveling north and the start of Northern Hemisphere spring. On this date hours of daylight nearly equal hours of night at all locations on the globe; thus the term: "equinox".

Daylight Savings Time begins for us at 2am on Sunday, March 13th. All times noted in this issue of First Light are correct before and after the change; i.e. EST until the change and EDT after the change.



Mercury begins March lost in the Sun's glare but quickly emerges for its best evening performance of 2011 in the month's second half; note that it's easier to find near **Jupiter** at midmonth when bright Jupiter points a spotlight on Mercury. Jupiter sits a bit above Mercury beginning on March 8th; on March 15, the two planets pass just 2° from each other. If you can't spot Mercury with your naked eyes, sweep along the horizon with binoculars. See our Mooncusser's Almanac chart to check Mercury and Jupiter's set times vs the sun.

As Mercury and Jupiter wane toward the sun in March, **Saturn** rises earlier and earlier; at 8:17pm on March 1; at 7:08pm (DST) on March 31.

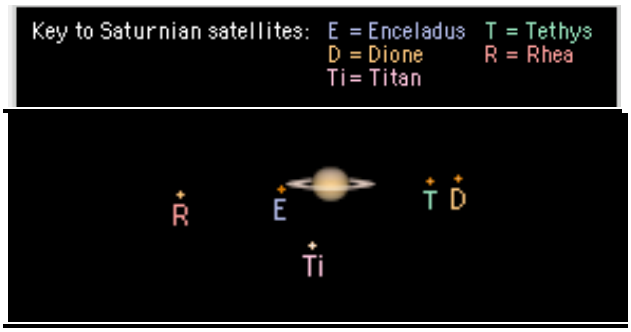
As the month progresses, Saturn will be higher and higher in the sky each evening and it's time to start studying the movements of the big moons. Any telescope will show Saturn's brightest moon, 8th-magnitude Titan. This haze-shrouded satellite has an orange hue through scopes with good optics. Titan orbits Saturn every 16 days. It passes due north of the planet the nights of March 8/9 and 24/25 and due south March 16/17. Small telescopes also reveal a trio of 10th-magnitude moons: Tethys, Dione, and Rhea. They orbit Saturn much faster than Titan (in 1.9, 2.7, and 4.5 days, respectively) so they change positions relatively fast.

Look for Tethys and Dione next to each other the evening of March 18, when they lie to Saturn's east.

Resources for Positions of Saturn's Moons:

Go the following web address to access Sky and Telescope's Java Utility for showing the positions of Saturn's main moons for any date and time.

Example plot:

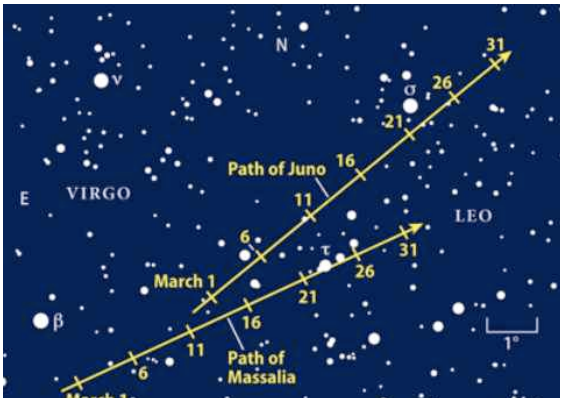


Saturn's Main Moons 3/1/2011 0100 UT

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

---

Take time this month to see if you can see either or both of two mag 9 asteroids travelling within 4º of each other



together in Leo as shown in this finder chart.[7]
These main-belt asteroids, **3 Juno** and **20 Massalia**, reach opposition within 2 days of each other in mid-March. Be careful not to mistake the asteroids for background stars. Make a sketch of the area and then return to the same field a night or two later. The asteroids will be the points of light that move. Although Juno lies considerably farther away than Massalia, they appear equally bright because Juno is nearly twice the size of 90-mile-wide Massalia.

Look for the **zodiacal light** some 90 minutes after sunset during March. Look toward the horizon at the point where the sun set.

If you look under a dark sky not hindered by moon or lights, you should be able to see a faint glow from billions of dust grains in the inner solar system as the Sun shines on these particles, creating the so-called zodiacal light. The cone-shaped glow has a broad base that points nearly straight up from the western horizon. Under superb conditions, the glow extends into Taurus. The glow is a bit dimmer than the Milky Way so you do indeed need dark skies. Avoid March's first week and its final 10 days when the moon makes too much light.

While we do not major on dawn observing opportunities, there will be good opportunities to view and photograph **Venus near a thin crescent moon** before sunrise both at the beginning (March 1: 10% lit crescent about 5º to the left of the planet) and near the end of the month (March 31: 9% lit crescent lies a similar distance.) Look also days before and after the cited days.

[Thanks to Martin Ratcliff and Alister Ling of *Astronomy* for providing the source for most of the information presented above in their "The Sky This Month" article online[7].]

Moon Phases, March, 2011

New Moon Friday, March 4th, at 3:46pm EST
First QTR Saurday, March 12th, at 6:45pm EST
Full Moon Saturday March 19th, at 2:10pm EDT
Last QTR Saturday, March 26th, at 8:07am EDT

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 contact your editor for information or sources.

Mooncusser's Almanac and Monthly Alert[1]
By Peter Kurtz
March 2011

Object	Mar. 1 (EST)	Mar. 15 (EDT)	Mar. 31 (EDT)
Sun	R: 06:15 S: 17:30	06:52 18:47	06:25 19:04
Moon	R: 04:35 S: 14:48	14:16 04:27	04:55 16:37
Mercury (early evening)	R: 06:32 S: 17:47	07:25 20:09	06:40 20:19
Venus (predawn)	R: 04:19 S: 14:01	05:18 15:28	05:09 16:02
Mars (in the sun)	R: 06:08 S: 16:59	06:38 18:01	06:03 18:01
Jupiter (early evening)	R: 07:23 S: 19:45	07:35 20:06	06:41 19:23
Saturn (evening)	R: 20:17 S: 07:56	20:17 07:59	19:08 06:53
Uranus (in the sun)	R: 07:01 S: 19:02	07:08 19:11	06:07 18:13
Neptune (pre-dawn)	R: 05:49 S: 16:26	05:55 16:34	04:53 15:33
Pluto (pre-dawn)	R: 02:39 S: 12:26	02:45 12:32	01:42 11:30

Observing "Down Under" (and lots of other places!):

Mike Hunter sent the following note to First Light:

Two minutes ago I was observing the Centaurus A radio galaxy live from the "Snake Valley Australia "site via the internet and their Mallincam video camera. In color no less. A few minutes before that I saw the Tarantula Nebula in the Greater Magellanic Cloud. I was able to watch the image slew (i.e., I saw the star trails) to each of those objects. These are real time, color images, which look just like the ones you see in books.

The type of scope being used was not shown. But, it was real-time observation. There was a chat line open so that viewers around the world were chatting with the person running the setup. One viewer asked for the Tarantula nebula. The operator asked that viewer if they wanted to see Centaurus A. The viewer said "sure". Presto, there was the radio galaxy clear as could be.

Go to www.nightskiesnetwork.com and pick Snake Valley Australia. Wicked cool.

Mike.

[Editors note: "nightskiesnetwork" provides you a list of "live" feeds from astronomers using their scopes from around the world. The table of sites shows which sites are live or offline.]

Tools for Observers:

In January, 2009, two years ago, we introduced the availability a little Observing Guide called "Objects in The Heavens", by one Peter Birren. A copy was circulated at the 2008 CCAS meeting. We noted at the time: "Not only observers new and experienced, but any teacher of Astronomy will enjoy having a copy of this little book to lead observing sessions."

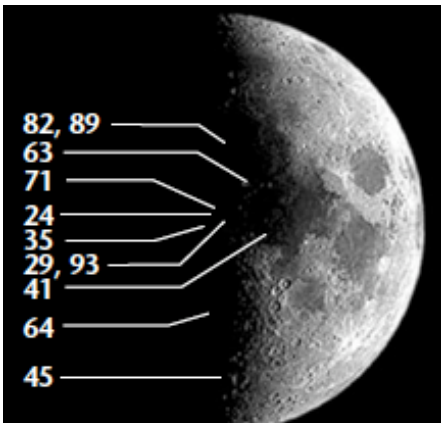
Update: Your editor ordered and just received the new 5th edition. While it is hard to imagine how the older edition could possibly be improved, **the new edition contains seven pages which may be the best "at your scope" reference tool available supporting observing our moon.**

Sure, the new edition has all the great reference tools for constellations, stars of all persuasions, deep sky objects, planets, and more that the earlier edition did, but it has an imaginative and handy new approach to supporting moon observing sessions. Most of us know that the key to observing lunar features is to catch them when they are side-lit by the rising or setting sun at the moon feature in question. Following two pages giving a succinct overview of our big satellite and its key feature types, Birren provides five pages highlighting the key features at the terminator on each of the 28 days of the lunar cycle. Birren has taken Chuck Wood's (Sky & Telescope) Lunar 100 list, added a few of his own favorites, and organized them as they "show up" at the terminator during the monthly cycle per the Astronomical League's Lunar Club program. The result is five pages of portraits like this example for items at the terminator on Day 6 of the lunar cycle:

THE MOON

DAY 6

24 Hyginus Rille – Rimless collapse pits
29 Ariadaeus Rille – Long, linear ditch
35 Triesnecker Rille – Typical rille (groove)
41 Bessel ray – Ray of unknown origin crossing Bessel
45 Maurolycus – Area of saturation cratering
63 Imbrium sculpture – Basin ejecta
64 Descarte – Apollo 16 landing site
71 Sulpicus Gallus – Ash eruptions northwest of crater
82 Linne – Small crater NE of Valentine
89 Valentine dome – Shallow volcanic dome
93 Dionysius rays – Unusual dark rays from bright crater



Please click on this URL: http://www.birrendesign.com/astro.html for more on the guide, samples of inside pages, reviews, and, if you wish, how to order copies directly from Peter Birren's website. If you look carefully at the website you will also see that you can download copies in two alternative PDF formats for use on your computer. But the plastic cover, "sits flat" coil binding, and sturdy pages are critical, in my view, when using the book at the 'scope. For $25, you can't go wrong.

Got 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 situation[8]. 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.

Cape Cod Astronomical Society

President	Tom Leach	508-237-9291
Vice President	Paul Cezanne	508-487-1456
Secretary	Charles Burke	508-394-9128
Treasurer	Peter Kurtz	508-255-0415
Observatory Director	Michael Hunter	508-385-9846
First Light Editor	Peter Kurtz	508-255-0415
		info@CCAS.ws

Mailing Address: PO Box 207 Harwich Port MA 02646

Cape Cod Astronomical Foundation

Chairman	Werner Schmidt	508-362-9301
Vice Chairman	Michael Hunter	508-385-9846
Director R&D	Bernie Young	508-394-1960
Secretary	Ed Swiniarski	508-896-5973
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.

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 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 mimima 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) Bob Berman's Strange Universe: A few times only: http://www.astronomy.com/Columnists/Bob Berman/2011/01/Bob Bermans Strange Universe - A few times only.aspx

5) A little more on ε-Aurigae (from Reference 4):
A whopping 3,000 light-years away, the dimming of this star was a mystery the last time around. What could possibly create a 2-year-long eclipse? It would have to be the largest star in the known universe. And the light curve is funny, too. The best guess: *Epsilon* is not eclipsed by a companion star at all! Rather, it's orbited by a dust cloud that periodically glides in front of it, blocking half its light. The flat thick disk probably surrounds an unseen star or two of its own.

The current event started in 2009 and lasts until late this spring. Totality, meaning maximum eclipse, ends around March 12. This is our last chance until 2036 to see Epsilon change. This time around is historic: astronomers using the Spitzer Space Telescope just made a breakthrough. Scientists designed that instrument to view faint objects in infrared light, but it would be blinded by naked-eye stars, so they tried a clever trick. They pointed just a corner of the orbiting scope's detector at bright *Epsilon* and took an exposure of just 1/100 of a second, the fastest "shutter speed" available. It worked. Obtaining the clearest-ever view, they confirmed that the enormous mystery-entity periodically blocking the star is indeed a thick flat cloud — and they found its material is gravel rather than dust. Wow.

6)
http://campaign.r20.constantcontact.com/render?llr=ylr4fkcab&v=001p2v57KM8pgYrFfdLPHEhzfYNrlhGkXTM8fWgkRmEFzeOED5yq4xiTC_67tvt20bDDx_X00mVOq0rU6GqLsBfExc555UMRv86ul5Xcin823VqXf7bLz6rPf9pi4cDZA42DCV9AJQsxHar3rRMUVbMF6t_0x5N1VTe-tbba4n9eRdmZ9kWvWZX46Xa_8sjLR-zK1b9bf96VezLUTJHDLSNVBjJn71JxkY6

7) *Astronomy Magazine's* online The Sky This Month online feature http://www.astronomy.com/en/News-Observing/Sky this Month/2010/12/Venus rules the morning sky.aspx

8) Tom Leach's draft video on light pollution: http://www.youtube.com/watch?v=AkwLyD1YKzM