



Astronomy News for Bluewater Stargazers
Vol 8 No. 4 Apr 2014

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In Memory of John William Lash

From the Editor: by John H.

I have just received notice from several BAS friends that one of our own, John Lash, passed away Thursday March 20, 2014.

John was a long-time member of BAS and was one of the founding members of its predecessor, the Bruce County Astronomical Society. John was always there with a telescope for public viewing nights and a supporter in many ways of our fund-raising activities like the Harvest Dinner. He and Sandra never missed one and he always came with an auction donation.

I remember observing with him through his Astro-Physics telescope. Though it was a bit of a chore to set up, he was always willing to come to our viewing nights and to Starfest and share his love of the heavens. His contribution to astronomy and his friendship will be sadly missed.

The visitation is Monday, March 24, 2014 from 12:30 p.m. - 2 p.m. at Davey-Linklater Funeral Home, 757 Princes Street, Kincardine, Ontario. The funeral service will be after the visitation at 2 p.m.

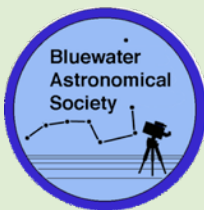
Memorial donations to the Heart & Stroke Foundation or the Canadian Cancer Society would be appreciated as expressions of sympathy.

On behalf of BAS executive and members, our sincere condolences to Sandra and family.

John

Lash, John William of R.R. #2 Tiverton, at his home on Thursday, March 20, 2014 in his 68th year. Beloved husband of Sandra Lash (nee Grozelle). Dear father of Becky Lash and her husband Jason Jardine of Vancouver, British Columbia and Jason Lash and his wife Bronwen of Barrie. Loved grandfather of Clara and Islay Lash. Brother of Herbert (Peggy) Lash and Bruce (Elizabeth) Lash all of Sault Ste. Marie. Brother-in-law of Faye (Gordon) Smedley of Sault Ste. Marie, and Terry (Carol) Grozelle of Elliott Lake and Jean Grozelle of Red Deer, Alberta. Predeceased by his parents William and Isabelle (nee Saunders) Lash and his brother-in-law Calvin Grozelle. Visitation will be held at the Davey-Linklater Funeral Home, 757 Princes Street, Kincardine, ON, N2Z 1Z5, (519) 396-2701, on Monday March 24, from 12:30 pm until the time of the funeral service at 2:00 p.m., with Crystal Morais officiating. Interment, Greenwood Cemetary, Sault Ste. Marie at a later date. Memorial donations to the Heart and Stroke Foundation or to the Canadian Cancer Society would be appreciated as expression of sympathy.

Disclaimer: StarGazer News reports on the activities of the Bluewater Astronomical Society (formerly Bruce County Astronomical Society) but any opinions presented herein are not necessarily endorsed by BAS. See the BAS website at www.bluewaterastronomy.info for up-to-date details relating to BAS events. The BAS weblog is back, with articles of immediate interest written by various BAS members.



StarGazer News is produced and edited by John Hlynialuk. I am solely responsible for its content. Your original articles, images, opinions, comments, observing reports, etc., are welcome. I reserve the right to edit for brevity or clarity. Errors or omissions are entirely mine although I strive for accuracy in star events, etc. I will not publish your emails or other materials without your specific permission to do so. No part of this publication shall be reproduced in any form whatsoever without the editor's consent. However, the Sky Calendar and Feature Constellation pages are free to copy. Feel free to forward this issue in its entirety to your friends. Email comments and/or submissions to stargazer@wightman.ca

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BAS Events for April 2014

- Apr 2** Wed **BAS meeting:** Grey Roots Museum, 7 pm, regular meeting will follow our speaker, Dr. Mary Shouldice, optometrist. Topic: "Eyesight and the Aging Astronomer"
- Apr 5** Sat (FQ-2) **BAS viewing @Fox@dark** (optional viewing this month -see Apr 15 and Apr 26 for other viewing events this month)
- Apr 15** Tue (FM) **TOTAL LUNAR ECLIPSE** -best one for 2014 umbral contact 1:58 am DST Apr 15, total phase from 3:06 am DST to 4:24 am Apr 15. Last umbral contact at 5:33 am DST, Moon sets 6:46 am DST Apr 15. Observing from ES Fox Observatory. More on pg. 12
- Apr 26** Sat (NM-3) **BAS viewing @Fox@dark** (optional viewing)

UWO Meteor Camera at ES Fox Observatory Captures Fireball

ES Fox Observatory hosts one of a dozen cameras (camera 11) of the South Ontario Meteor Network operated by the University of Western Ontario from London, ON. On Mar 18, 2014 at 10:24 pm DST (when it was clear over S. Ontario prior to clouding over for the Regulus event!) a fireball was recorded on 7 of the SOMN cameras along with two NASA cameras south of Lake Erie. The best shot was from the Aylmer camera (image pg. 3) where the fireball went pretty much overhead. The streak is much smaller in the Fox camera (lower left of image at right) because of the distance, but the height (75 km) of the trail was sufficient that it was observed by both the Fox and Carr Observatory (Collingwood) cameras from about 250 km away!

The Fox image also shows two aircraft trails (the short straight streaks centre), Jupiter just below the right end of the centre aircraft and the lights from the dining hall of the BOEC at right. The Moon is just rising through the trees at upper left. A vapour trail is also visible in the image. There are also three hot pixels masquerading as stars!



20140319 02:24:27.505 UTC (9)

ES_Fox (11A)

Astronomy Events April 2014

- Apr 3** Thu (NM+3) **Spectacular Graze of 68 Tau (mag 4.3)** track runs near Tiverton/Kincardine. Contact John H. if you are interested in observing. Several 4th magnitude stars in the Hyades are occulted tonight as well.
- Apr 8** Tue (FQ+1) **Mars reaches opposition** -magnitude -1.5 visible in sky all night long. Mars viewing is good for a month or so before and after opposition.
- Apr 15** Tue (FM) **TOTAL LUNAR ECLIPSE** -best one for 2014 umbral contact 1:58 am DST Apr 15, total phase from 3:06 am DST to 4:24 am Apr 15. Last umbral contact at 5:33 am DST, Moon sets 6:46 am DST Apr 15. Observing from ES Fox Observatory.
- Apr 22** Tue (LQ) **Lyrid Meteors**, 20/h at peak 1 pm. Some may be visible on evening Apr 22. Moon waning 46%. This is also **International Earth Day**.
- Apr 29** Tue (NM) **Annular Solar Eclipse** ("ring" eclipse) visible in Australia and Antarctica only.

Camera 8 of the SOMN network caught the best image at 2:24:27.501 UTC. There was a flare early in the trail that was recorded on all cameras. The light emitted was bright enough to illuminate the nice mammatus clouds in the area and was reported by Peter Brown to be about the intensity of the full Moon. Early calculations show the object was about the size of a basketball, large enough that meteorites from a few grams to several hundred grams (baseball-sized) may have come to earth.

I received notice of the event, on Mar 20 while feeling miserable that the Regulus event was clouded out. What's more, Mother Nature was rubbing it in because at sunset May 20, the sky had mostly cleared up after one day (Mar 19) of rain and another (Mar 20) with several cm of snow fall. A Facebook posting (pg.4) later indicated that not one person on the planet saw it. The cloud cover over eastern N. America was that extensive.

The email from Peter Brown with the details of the St. Thomas Fireball made up for the Regulus non-event.

Oddly enough, two other fireballs were reported the previous day, but these were in Nova Scotia. What was even

Fireball May Have Produced Meteorites

Researchers from Western University have released footage of a basketball-sized meteor that was almost as bright as the full moon. The meteor lit up the skies of southwestern Ontario earlier this week and Western astronomers are now hoping to enlist the help of local residents in recovering one or more possible meteorites that may have crashed in the area just north of St. Thomas, Ontario.

For video footage, still images and site maps, please visit: http://meteor.uwo.ca/research/fireball/events/st_thomas/overview.html

Peter Brown, Director of Centre for Planetary Science and Exploration (CPSX), who specializes in the study of meteors and meteorites, says that on Tuesday, March 18, a long-lasting fireball which occurred near 10:24 p.m. was detected by seven all-sky cameras of Western's Southern Ontario Meteor Network (SOMN) and two camera systems in Ohio and Pennsylvania operated by NASA.



20140319 02:24:27.501 UTC (9)

Aylmer (08A)

more odd in that case was that these two separate events appeared at about the same time on two consecutive mornings. This was so remarkable that it made the national news on Mar 19. Little did we know that at the time, Peter Brown, Phil McCausland and the rest of the meteor physics team at UWO were processing the data from the

St. Thomas fireball and preparing a press release announcement. Furthermore they were getting ready to head to St. Thomas, ON, just a short drive from UWO to hold a news conference Mar 21 and start the ball rolling in the hunt for possible meteorites. I am sure this is just the beginning of the story of the St. Thomas fireball. Stay tuned. SGN will keep you informed as events unfold.

The brilliant fireball started near Port Dover at 75 km and moved westward before ending at 32 km altitude between Aylmer and St. Thomas, ON. One or more meteorites were produced by the slow

unusual events at the time, or who may have found possible fragments of the freshly fallen meteorite.



fireball based on the video records from the cameras.

Brown along with Phil McCausland, at Western's Department of Earth Sciences, are getting the word out to locate any fallen meteorites. Researchers at Western are interested in hearing from anyone approximately 5 km north or northwest of St. Thomas, who may have witnessed or recorded this event, seen or heard

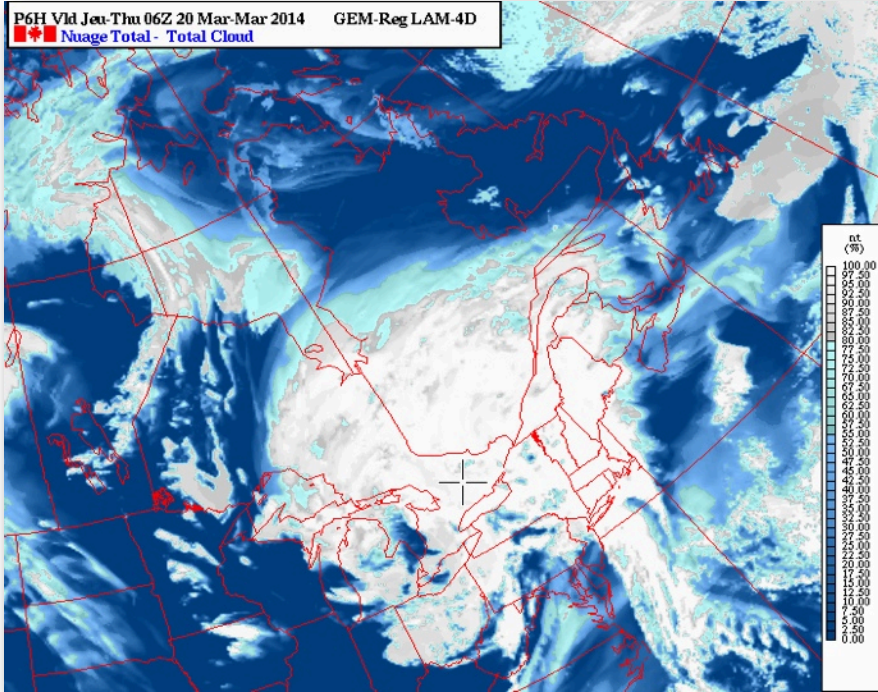
According to McCausland, meteorites are of great scientific value. He also points out that in Canada meteorites belong to the owner of the land upon which they are discovered. If individuals intend to search they should, in all cases, obtain the permission of the land owner before searching on private land.

Meteorites may best be recognized by their dark and scalloped exterior, and are usually denser than normal rock and will often attract a fridge magnet due to their metal content. In this fall, meteorites may be found in a small hole produced by their dropping into soil. Meteorites are not

dangerous, but any recovered meteorites should be placed in a clean plastic bag or container and be handled as little as possible to preserve their scientific information.

If you have questions, observations or possible meteorites from this March 18, 2014 event, please contact Phil McCausland at 519-661-2111, ext. 88008 or on his cell at 519-694-3323.

Entire Erigone Path Under Cloud



Regulus Occultation 2014 Timeline Recent

Regulus Occultation 2014
March 20

Sadly, as of 4pm today, March 20th, there are no confirmed observations from this morning's occultation of Regulus from anywhere, including Bermuda where several IOTA members travelled in an attempt to beat the clouds and rain that blanketed the entire occultation path. From most places even the full Moon was invisible behind thick clouds that rolled overhead in a continuous layer that never seemed to end.

SLOOH did a fine job broadcasting images of the asteroid approaching the star, taken from their observatory in the Canary Islands. Of course this was far outside the predicted path of the occultation visibility.

On April 3/4 the Moon will occult various stars of the Hyades star cluster, so stay tuned for news of that event. The good news is you won't have to travel to see it - the Moon's shadow is big! Timing lunar occultations is a good way to get your recording equipment tuned up too.

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12 people like this. Top Comments

Asteroid Breakup Seen for First Time

March 6, 2014: NASA's Hubble Space Telescope has recorded the never-before-seen break-up of an asteroid into as many as 10 smaller pieces. Fragile comets, comprised of ice and dust, have been seen falling apart as they approach the sun, but nothing like this has ever before been observed in the asteroid belt. "This is a rock, and seeing it fall apart before our eyes is pretty amazing," said David Jewitt of the University of California at Los Angeles, who led the astronomical forensics investigation.

The crumbling asteroid, designated P/2013 R3, was first noticed as an unusual, fuzzy-looking object by the Catalina and Pan STARRS sky surveys on Sept. 15, 2013. A follow-up observation on October 1 with the W. M. Keck Observatory, revealed three bodies moving together in an envelope of dust nearly the diameter of Earth.

Hubble ST, with its superior resolution, showed 10 embedded objects, each with comet-like dust tails. The four largest rocky fragments are up to 400 yards in diameter. Hubble data showed the fragments drifting away from each other at a leisurely one mph. The asteroid began coming apart early last year, but new pieces continue to reveal themselves, as proved in the most recent images.

It is unlikely the asteroid is disintegrating because of a collision with another asteroid, which would have been instantaneous and violent.

Nor is the asteroid coming unglued due to the pressure of interior ices warming and vaporizing.

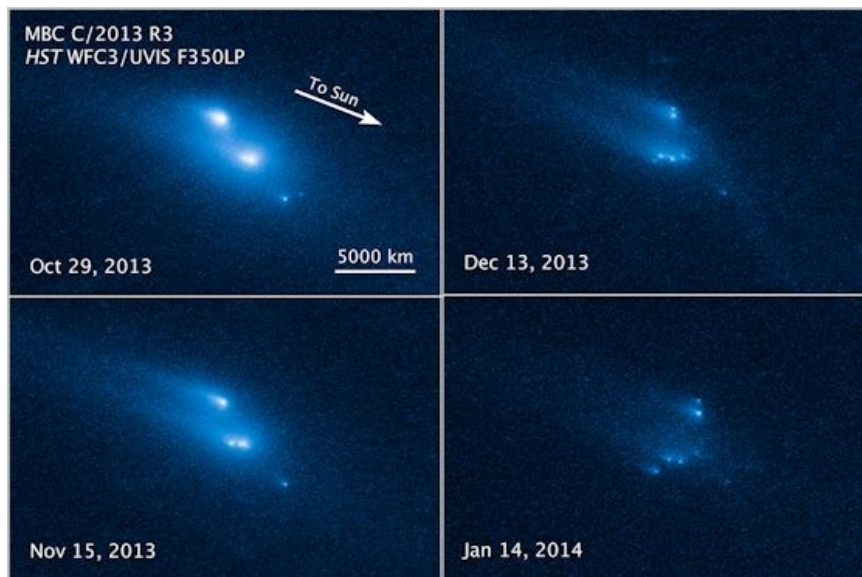
The asteroid is probably disintegrating due to a subtle effect of sunlight, which causes the rotation rate of the asteroid to gradually increase. Eventually, its component pieces gently pull apart, the first time this has been observed. For this scenario to occur, P/2013 R3 must have a weak, fractured interior -- probably as the result of numerous non-destructive collisions with other asteroids sometime in the last billion years, a phenomena that may be very common.

With the previous discovery of an active asteroid [spouting six tails](#), named P/2013 P5, astronomers are finding

more evidence the pressure of sunlight may be the primary force causing the disintegration of small asteroids -- less than a mile across-- in our solar system.

The asteroid's remnant debris, weighing about 200,000 tons, will in the future provide a rich source of meteoroids. Most will eventually plunge into the sun, but a small fraction of the debris may one day blaze across our skies as meteors.

Editor: [Dr. Tony Phillips](#) | **Credit:** [Science@NASA](#)



Thoughts on the Passing of a Wonderful Friend

John William Lash – 68 Years Young

Our lives are enriched immeasurably by those special friendships we form during life's journey. Friendships, that initially are borne of mutual interests, are then solidified over the years by common experiences and shared family values. For Paula and myself, John Lash was one of those special friends. So, it was with great sadness that we received the news on Friday morning, March 20th, in an email from Rob Vollett, that John had passed away the previous day. My wife, Paula, and I were getting ready to depart for Sierra Vista to get our truck serviced before our long drive back to Ontario in two weeks.

We had known John for over 30 years and we felt the sadness that comes from the loss of a long time friend. Our hearts went out to John's wife, Sandra, his two children, Becky and Jason, their spouses, their two granddaughters, and John's extended family on both sides. John always talked with great joy about his family, and, particularly at this stage of his life, the joys of being a grandfather. Sometimes, life can be simply too short! A sad time.

Paula and I originally met John through our shared interest in astronomy. John was exceptionally generous with his time and equipment. He loved helping others. Many years ago, when we built the first phase of our Quetican observatory, we had to cut down a number huge maple and ash trees. Even Paula's favourite maple tree, a tall 21/2 foot diameter specimen, was sacrificed. Soon our yard was covered in huge trunk sections and blocks of maple and ash. John offered to bring his trailer, chainsaw, and splitting axe and help remove this debris.

What a job! It took the better part of two days. I wish I had taken a photograph of John's splendid work. We were impressed with his energetic manhandling of the blocks of wood ... probably a carry-over from his early years when living up on Lake Superior. Years later, when Paula and I decided to expand the observatory, we really needed help. Everything from assembling the 15 foot diameter ProDome on the roof of the 3 story building, to carrying the CDK PlaneWave 20 up the spiral stairway and installing it on the Chronos mount. We knew we could count on John. He joined us to help, along with other members of BCAS, and then, on three separate occasions, to install the astronomy component of the building.

John reflected in the secondary of the Plane Wave 20



John was interested in many aspects of astronomy and, on numerous occasions, he would call and we would talk for a long time about astronomy, his family and friends, and new equipment. But, John's greatest joy came when he shared his astronomy



knowledge and quality equipment with others. Over the years, he owned a number of telescopes, from a Meade 10 inch SCT, to a Celestron SCT-14, and, finally, the telescope he was most proud of, a 6 inch Astro-Physics refractor. He loved sharing the views of the planets and the Moon through this telescope. One night, during a favourable Mars opposition, he invited Paula and me to his home observatory to view Mars through his AP refractor, which he had equipped with a Bino-Vue, and Panoptic eyepieces. That splendid night, John provided us with our best views of Mars of that opposition... polar caps, dark markings, and dusty orange deserts. Wonderful! Before we left for home, early in the morning, John showed us the Perseus Double Cluster. What a knockout view it was! To this day, that view remains the best we have ever had of that cluster. No photograph could ever compare to the telescopic view that night.

I love Robert Frost's Poem "The Star Splitter" and I like to illustrate the joys of amateur astronomy with quotes from that poem. Here is a particular verse there that captures the essence of many stargazing experiences I had with John.

"Bradford and I had out the telescope...
(we) pointed our thoughts the way we pointed it
And, standing at our leisure till the day broke,
Said some of the best things we ever said ..."
"The Star-splitter" by Robert Frost

John loved attending astronomy gatherings. Over the years, he attended the Powassan Star Party, the Huronia Star party, and his favourite gathering of them all, Starfest. Readers of this column know that Starfest is Canada's largest star party, and it is held annually, usually in August, at the River Place, near Mount Forest, Ontario. John had his special camping and observing spot. We called it John's perch, located on the SE corner of the property at a high point on the edge of a ravine. John would arrive at Starfest a few days early to ensure he would have this special spot. He would spend his mornings fishing in the Saugeen River, his afternoons socializing, and his nights sharing
(cont'd next page)

(l to R) Darcy Robbins, John Hlynialuk, and John Lash complete installation of Quetican's 15 ft Pro-Dome shutters



his telescope with anyone passing by his campsite. Sometimes, late at night, I would join him there for a peanut butter sandwich (my favourite), a coffee, some pleasant conversation, and, of course, telescope views. This was a real vacation for him and only rarely did he attend the scheduled talks. There was more joy for him in fishing, or sharing the stars, than sitting through a lecture.

John's willingness to share carried over into the public outreach of our local astronomy club, formally known as BCAS now the Bluewater Astronomical Society. John would transport and set up his equipment for public star nights at McGregor Provincial Park or the Fox Observatory at the Outdoor Ed Center near Oliphant. I like this quote, again

from Frost's "The Star Splitter", because it captures John's love of sharing the night sky.

"The best thing that we'er put here for's to see;
The strongest thing that's given us to see with's
A telescope. Someone in every town
Seems to me, owes it to the town to keep one.
"The Star-splitter" by Robert Frost

Paula and I will really miss John Lash. He was a true friend, always interested in our family and our astronomy travels and projects. The best gift our parents ever gave us was the opportunity to experience life in all its richness. One of the rich experiences we have had was the friendship of John Lash. Our deep sympathy, prayers, and thoughts are with his wife, Sandra, Jason and Becky, and their fine families at this time of bereavement. -Doug C.



John Lash, a wonderful friend, taken at a Quetican Observatory work party

(L to R) Doug Cunningham, John Lash, John Hlynialuk, and Rob Vollett getting ready to carry the CDK PlaneWave 20 up the observatory stairs Apr 26, 2008



John, setting up his refractor for a night of sharing the stars at McGregor Park (Dan Ostler photo May 24, 2008)



Funerals have never been places where one expects to laugh heartily, but I did just that at the service for John Lash. So did the rest of the audience. The tone was set by the very first words I read in the memorial booklet: "Miss Me But Let Me Go" was the title of the poem below John's picture and it was as if he were looking you in the eye and speaking these words:

"I want no rites in a gloom filled room
Why cry for a soul set free.
Miss me a little, but not too long
And not with your head bowed low
Remember the love that we once shared
Miss me, but let me go..."

There were tears, mostly of sorrow but some of joy at remembering the family man who loved his wife, children and grandkids. There were nods of understanding of the special relationship he had with many who he treated like family. Stories from his son Jason and

daughter Becky brought mixtures of tears and chuckles: John loved to share what he loved, especially fishing. I also saw folks smiling in appreciation of John's woodwork, his gymnastic prowess in High School (he was an OFSAA champion), and his dedication to learning how to play the bagpipes. (Yes, there is a great story there...)

And, as I expected, there were stories of his love of sharing the views through his telescope and camping at Starfest. Many of us remember him and his Astro-Physics refractor showing off Saturn or Mars to whomever stopped by. The image above shows him as I will always remember him, getting ready for a night of stargazing with friends at McGregor Park.

So yes, John we will try to fill the chasm in our hearts now that you are gone with memories of how much you meant to all of us.

Miss me a little, but let me go...
Easy to say, my friend, but not that easy to do. -John H.

Life on Mars?

Posted on Jan 30, 2014 4:14 pm Physicsworld.com

By Michael Banks

You may remember the story of Walter Wagner, the Hawaii resident who set his sights on stopping CERN's Large Hadron Collider (LHC).

Wagner, and a colleague, Luis Sancho, filed a federal lawsuit in the US District Court in Honolulu in 2008 to prevent the LHC from starting up, claiming it would create a growing micro black hole swallowing our planet. In late August 2010 a judge from Hawaii threw out the case, finding that Wagner had no standing before the court.

Now another lawsuit has been filed with respect to a "rock" on Mars.

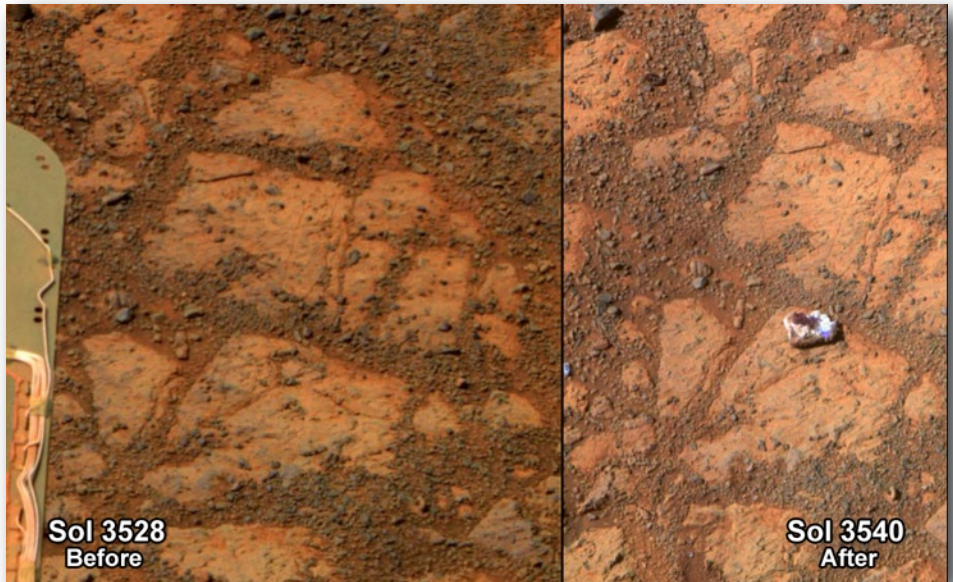
In mid-January NASA released a photo taken from the Opportunity rover of a strange white-coloured object. The weird entity was not visible on 26 December 2013 but the object mysteriously appeared in an image taken of the same spot on 8 January (see above image).

Despite wild speculation on the Internet, NASA concluded a rather more mundane explanation for the object's origin. "We have looked at it with our microscope. It is clearly a rock," Steve Squyres, the principal investigator of the Mars exploration rovers, told reporters last week.

Yet that was not enough for some people, including Rhawn Joseph, who asserts that it is in fact a living organism. Not satisfied with NASA's explanation, Joseph has now filed a lawsuit in California to make NASA examine the rock more closely.

According to the writ, Joseph is a "scientist and astrobiologist who has published major scientific discoveries in prestigious scientific journals beginning in the late 1970s". He has also apparently attempted to contact NASA boss Charles Bolden as well as "10 other NASA administrators at NASA headquarters" to persuade them to examine the object in more detail, all of whom have ignored his requests. The 11-page writ, submitted on Monday, states that Joseph "immediately recognized [the] bowl-shape structure...as resembling a mushroom-like fungus, a composite organism consisting of colonies of lichen and cyanobacteria, and which on Earth is known as apothecium". Joseph claims that the life form was there the whole time, growing until it became visible.

He now wants NASA to take high-resolution close-up photos and, if the object is indeed biological, then NASA must acknowledge that the discovery was made by Joseph and "must ensure that [Joseph] appears as first author on and has final editorial approval of the first six scientific articles published or submitted for publication by NASA employees that discuss and present this discovery". So any guesses how long it will be before Joseph's writ follows that of Wagner's?



Rock That Appeared in Front of Opportunity on "Murray Ridge"

This before-and-after pair of images of the same patch of ground in front of NASA's Mars Exploration Rover Opportunity 13 days apart documents the arrival of a bright rock onto the scene. The rover had completed a short drive just before taking the second image, and one of its wheels likely knocked the rock -- dubbed "Pinnacle Island" -- to this position. The rock is about the size of a doughnut.

Image credit: NASA/JPL-Caltech/Cornell Univ./Arizona State Univ.

Final Word

Where Martian 'Jelly Doughnut' Rock Came From (NASA Science News)

This image from the panoramic camera (Pancam) on NASA's Mars Exploration Rover Opportunity shows the location of a rock called "Pinnacle Island" before it appeared in front of the rover in early January 2014. This image was taken Feb. 4, 2014.

Pinnacle Island, (see arrow in the lower left corner of this scene), has a dark-red center and white rim, an appearance that has been likened to a jelly doughnut. It showed up in front of Opportunity in an image taken on Sol 3540 (Jan. 8, 2014) at a location where the rock had been absent in an image taken four sols earlier. Researchers used the microscopic imager and alpha particle X-ray spectrometer on Opportunity's robotic arm to examine Pinnacle Island for several days in January.

In this February image, a rock that has been dubbed "Stuart Island," with similar dark-red center and white edge, is visible just left of the center of the scene (see arrow near center). Its location is uphill from Pinnacle Island. The rover's own solar panels blocked a view of it while the robotic-arm instruments were studying Pinnacle Island. The wheel track beside Stuart Island helps tell the story: Opportunity drove over a rock and broke it open. One of the pieces, Pinnacle Island, was knocked downhill.



Hubble Celebrates 24th Years with IR Image of Star Factory



In celebration of the 24th anniversary of the launch of NASA's Hubble Space Telescope, astronomers have captured infrared-light images of a churning region of star birth 6,400 light-years away. The collection of images reveals a shadowy, dense knot of gas and dust sharply contrasted against a backdrop of brilliant glowing gas in the Monkey Head Nebula (also known as NGC 2174 and Sharpless Sh2-252). The image demonstrates Hubble's powerful infrared vision and offers a tantalizing hint of what scientists can expect from the upcoming James Webb Space Telescope.

IMAGE ABOVE: Observations of NGC 2174 were taken in February, 2014. Massive newborn stars near the center of the nebula (and

toward the right in this image) are blasting away at dust within the nebula. The ultraviolet light emitted by these bright stars helps shape the dust into giant pillars. This carving action occurs because the nebula is mostly composed of hydrogen gas, which becomes ionized by the ultraviolet radiation. As the dust particles are warmed by the ultraviolet light of the stars, they heat up and begin to glow at infrared wavelengths. **Credit:** NASA, ESA, Hubble Heritage Team (STScI/AURA). For images and more information about Hubble, visit: <http://www.nasa.gov/hubble>

Astronomers spot record-breaking lunar impact

from the Monthly Notices of the Royal Astronomical Society

A meteorite with the mass of a small car crashed into the Moon last September, according to Spanish astronomers. The impact, the biggest seen to date, produced a bright flash and would have been easy to spot from the Earth. The Moon lacks the atmosphere that prevents small rocks from space from reaching the surface of the Earth. The result is very visible – vast numbers of craters large and small cover the whole of our nearest neighbour and record 4.5 billion years of collisions that span the history of the Solar system.

Although there is almost no chance of a very large object striking the Moon or planets, collisions with smaller objects are very common even today. The odds of seeing one of these by chance are pretty poor, so scientists have set up networks of telescopes that can detect them automatically.

On 11 September 2013, Prof. José M. Madiedo was operating two telescopes in the south of Spain that were searching for these impact events. At 20:07 GMT he witnessed an unusually long and bright flash in Mare Nubium, an ancient lava-filled basin with a darker appearance than its surroundings. See the video at: <http://www.youtube.com/watch?v=zCFDkj2JtYA&feature=youtu.be>

The flash was the result of a rock crashing into the lunar surface and was briefly almost as bright as magnitude 2, meaning that

anyone on Earth who was lucky enough to be looking at the Moon at that moment would have been able to see it. In the video recording made by Prof Madiedo, an afterglow remained visible for a further eight seconds.

The September event is the longest and brightest confirmed impact flash ever observed on the Moon. The Spanish telescopes are part of the Moon Impacts Detection and Analysis System (MIDAS) that monitors the lunar surface. This project is being undertaken by Prof Jose Maria Madiedo, from the University of Huelva (UHU), and by Dr José L. Ortiz, from the Institute of Astrophysics of Andalusia (IAA-CSIC) and continues a pioneering program that detected sporadic lunar impact flashes for the first time.

Since these impacts take place at huge speeds, the rocks become molten and are vaporised at the impact site instantaneously, and this produces a thermal glow that can be detected from our planet as short-duration flashes through telescopes. Generally, these flashes last just a fraction of a second. But the flash detected on 11 September was much more intense and longer than anything observed before.



Prof. Madiedo and Dr Ortiz think that the flash was produced by an impactor of around 400 kg with a width of between 0.6 and 1.4 m. The rock hit Mare Nubium at about 61,000 k/hr and created a new crater with a diameter of around 40 m. The impact energy was equivalent to an explosion of roughly 15 tons of TNT, at least three times higher than the largest previously seen event observed by NASA in March last year.

Observing impacts on the Moon gives astronomers an insight into the risk of similar (but larger) objects hitting the Earth. One of the conclusions of the Spanish team is that these one metre sized objects may strike our planet about ten times as often as scientists previously thought. Fortunately, the Earth's atmosphere shields us from rocks as small as the one that hit Mare Nubium, but they can lead to spectacular 'fireball' meteors.

Larry Miller Responds

In the February issue of SGN, I related the story of the attack on science by the federal government. That article was actually the contents of an email that I sent to Larry Miller, the local PC member. Imagine my surprise when several weeks afterwards, I got a call from Mr. Miller at Queen's Park, and I had a chance to personally re-iterate some of the points I made in the article.

The conversation ran for 20 minutes or so and I touched on the various cases of government short-sightedness. Mr. Miller's response was that the incidents were misrepresented, exaggerated or did not occur (to his knowledge). When a specific case of government withdrawal of funding was cited (the Experimental Lakes Area in Ontario) Miller's response was that the folks doing the protesting were complaining because their jobs had been cut. Although it is understandable that one would protest if you lost your livelihood, the "protestors" also decried the loss of important research opportunities and information that the unique approach to whole ecosystem management that ELA provided to not just Canadian policy makers but to others around the world. Overall, Miller, in my opinion had no real grasp of the benefits of

ELA and losses to science and informed policy that came from ELA. Fortunately, the Ontario and Manitoba provincial governments where the ELA is located bailed the program out.

With respect to the dozen or so research libraries that were closed (Fisheries and Oceans and others), he parroted the government's comment that the information was digitized so would be available to more researchers. My response was that you don't throw away the Mona Lisa because you have digitized it. Miller also seemed to be unaware that the material had been "culled" (read "trashed") hurriedly rather than carefully dispersed to universities or other institutions that were willing to take the materials. Librarians were given only days to do the digitizing job that would have taken months to do properly,

Miller's parting comment was, again, that he had not seen or was aware of the events (some even reported in the international press). All I can say is that Mr. Miller, like many other members, appears to not be very well-informed. And, unfortunately, the dismantling continues.

Visit these links for more commentary on the damage to science being done by the Harper government. The first one below is a Rick Mercer Rant (not his only one) you will enjoy.

<http://www.youtube.com/watch?v=zU7dDruEWJE#t=20>

<http://www.academicmatters.ca/2013/05/harpers-attack-on-science-no-science-no-evidence-no-truth-no-democracy/>

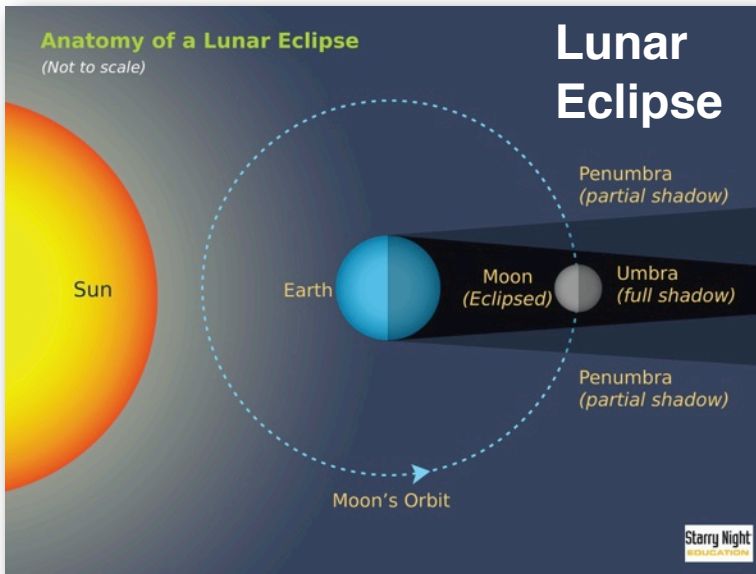
<http://www.mcgilldaily.com/2014/03/turning-a-blind-eye-to-science/>

<http://sciencewriters.ca/initiatives/muzzling-canadian-federal-scientists/>

<http://democracywatch.ca/campaigns/tell-harper-to-stop-muzzling-scientists/>



Oct 27, 2004 Lunar Eclipse Images by J.Hlynialuk



Eclipses occur because sunlight is blocked by some opaque body. In the case of LUNAR ECLIPSES, it is the Earth that casts its shadow and in SOLAR ECLIPSES, it is the Moon. The Earth's shadow is the larger of the two and shows up when it crosses the face of the Full Moon.

Lunar eclipses can be seen from whatever half of the Earth is in darkness, and can last 5 to 6 hours. The most interesting part is when the Moon is covered by the dark central shadow called the umbra which is not totally black for most eclipses of the Moon. Light can be refracted (bent) but the Earth's thin ring of atmosphere and it can show up as a red tinge to the umbral shadow. The colour varies from eclipse to eclipse due to obscuration by clouds or dust from volcanic eruptions with the range of shade going from deep grey (lots of dust) to cherry red (little obscuration). The moon may be so dark that it disappears to the naked eye or it may look like a red cherry in the sky.

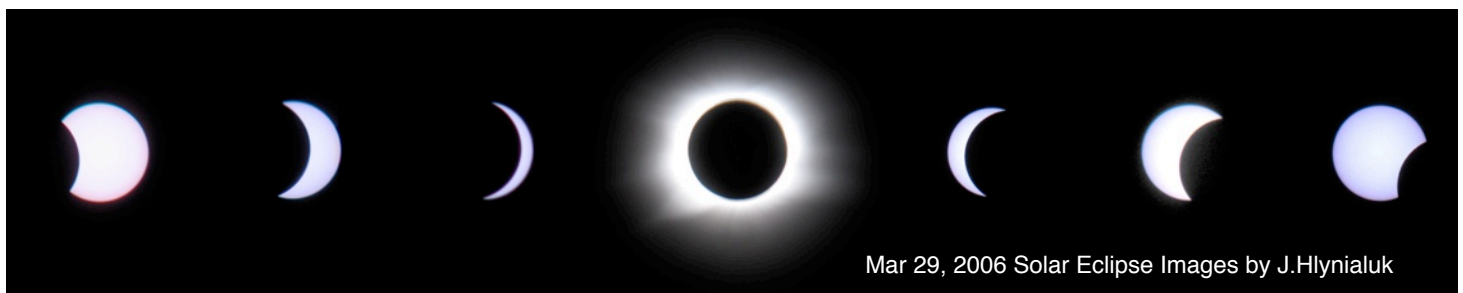
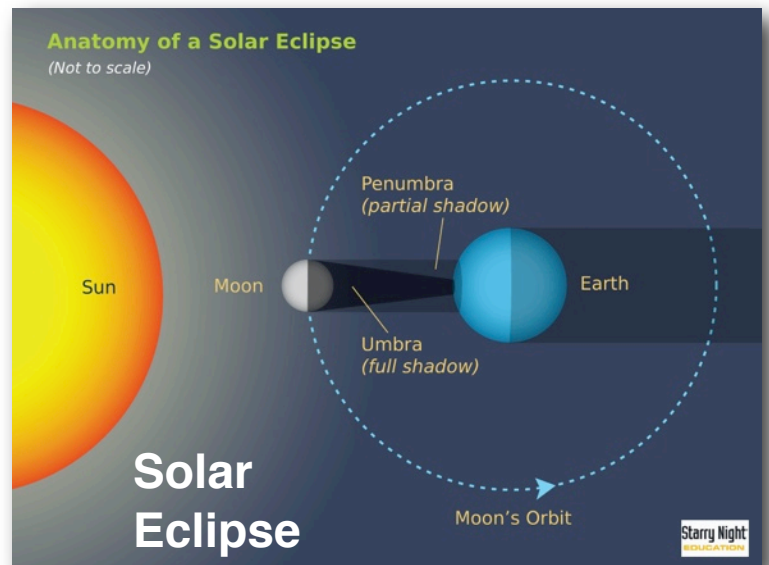
Viewing through binoculars is the best, but views through the telescope can reveal the edge of the shadow crossing craters on the lunar surface. Be prepared for a relaxing (some describe it as "boring" event). Get comfortable.

During a solar eclipse, the Moon's much smaller shadow makes a track across a limited region of the Earth. While lunar eclipses can be seen from whatever half of the Earth is in darkness, solar eclipses can only be seen from a narrow track called the shadow path and you have to be in the right place at the right time.

Solar filters are required for the partial phases before the hectic total phase which can last up to 7 minutes when the Moon and Sun are nicely lined up. Unlike lunar eclipses, solar eclipses are often very frenetic, especially if you are taking pictures. You have to plan the sequence of shots well to get the images and a forgotten lens cap on the camera can ruin an expensive trip. (This has not happened to me, but I recall one when I did not focus the camera as sharply as I should have). You won't be able to get comfortable!

And then there is the weather which can change (and did partly ruin the 1991 Baja eclipse) at a moments notice. Most trip organizers pay close attention to weather forecasts and the successful trips are the ones that can move to a new (better) location at the last minute.

Don't forget to just look at the thing, pictures are fine, but memories only get better with time.



Mar 29, 2006 Solar Eclipse Images by J.Hlynialuk

α-Orionis -Betelgeuse	δ-Ori - Mintaka	η-Ori - Algjebbah
β-Orionis -Rigel	ε-Ori -Alnilam	κ-Ori -Saiph
γ-Orionis - Bellatrix	ζ-Ori -Alnitak	λ-Ori - Meissa

Orion is generally considered to be the most beautiful and imposing constellation in the heavens. It is easily recognized; the four bright stars forming a large rectangle and the three second magnitude stars, equally spaced and forming a straight line (the Belt of Orion) enclosed by the rectangle, are a delight to the eye. No other constellation has so many bright stars. Compare the colors of Betelgeuse, a giant red star, and Rigel, a brilliant blue-white star. Rigel has a magnitude of 0.3 and is the 7th brightest star in the sky; Betelgeuse has a magnitude of 0.9 and ranks 12th in brightness. [Orion is in a portion of the sky that contains seven of the 20 brightest stars in the heavens; these are to be found in Orion, Auriga, Gemini, Taurus, Canis Major and Canis Minor in the Winter Hexagon -ed].

There are two famous nebulae in Orion; one, the Great Nebula, is visible to the naked eye. It is the prototype of the diffuse nebulae; a great cloud of cosmic dust 26 light years in diameter and 1,625 light years away. θ-Orionis marks the center of the Great Nebula; viewed through binoculars, the star seems to be enveloped in a hazy field that marks the nebula's presence. Even in a small telescope, the Great Nebula is an awe-inspiring sight. The other famous nebula is the so-called "Horse's Head" Nebula, a dark nebula silhouetted against a glowing cloud of cosmic dust in the shape of a horse's head. This remarkable object is not visible to the naked eye; long photographic exposures are required to show its details. The darkness of this cosmic cloud is due to the fact that there are no nearby stars to illuminate it. σ, θ and ι-Orionis mark the Sword of Orion. δ Orionis, the northernmost star in the Belt of Orion, lies almost exactly on the celestial equator. The Belt stars serve as valuable pointers; the line through them extended to the southeast points to Sirius and to the northwest, to Aldebaran in Taurus.

Double Stars

Star	Mag.	Sep'n (s)	Location	Remarks
β	0.1-8.0	9	051208	White-Orange.
δ	2.5-6.9	53	053000	White-Lilac.
ζ	2.0-5.5-10	2.5-57	053902	Yellow-Blue.
η	3.6-5.0	1	052302	
θ	5 thru 11	-	053305	At least 7 stars in this multiple system; lies in the heart of the Great Nebula (M42).
ι	2.9-7.3-11	11-50	053306	In a fine field
λ	3.7-5.6	4-29-78	053310	Yellow- Magenta; in fine field
ρ	4.6-8.3	7	051103	Yellow-Blue.
σ	4.0-10.3	11-13-42	053603	Grey-White-Blue-Red; beautiful quadruple
23	5.0-7.1	32	052003	
33	6.0-7.3	2	052903	
Σ627	6.3-7.0	2	045803	Striking.
Σ747	5.6-6.5	36	053406	
Σ750	6.0-8.0	4	053304	
Σ795	6.2-6.2	1.5	054506	
Σ816	6.2-8.7	4	055206	
Σ855	5.8-6.8-9.0	29-119	060603	Triple.

Messier Objects

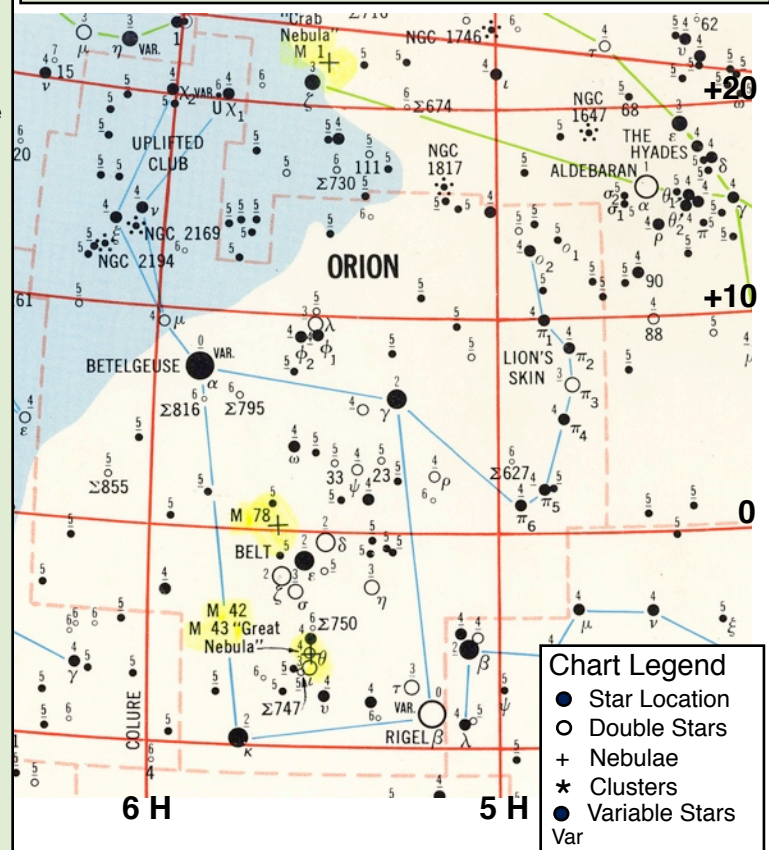
Mag	Location	Remarks
M42	053305	Diffuse Nebula. The "Great Nebula"
M43	053305	Diffuse Nebula.
M78	054400	Diffuse Nebula.

Objects of Interest in Orion (Ori)

U Orionis - Long period (372 days) variable, maximum magnitude 6.3. Location 055320.



Also in Orion, the Horsehead Nebula (Barnard 33) centre frame, is the more elusive requiring aperture of 14-inches or greater. NGC 2024, the Flame Nebula (left of star Alnitak -easternmost star of Orion's Belt, is much easier and can be glimpsed in 8-inch scopes. The star σ-Ori (lower right) is a beautiful quadruple system with widely spaced components. Frank Williams image, a 54 min exposure TV 85.



Times for Events are in DST (changeover Mar 9)

- Apr 02 03:00 Uranus in Conjunction with Sun
- 03 10:12 Occultation of δ^1 Tau (mag 3.8) by Moon**
- 10:57 Occultation of 64 Tau (mag 4.8) by Moon**
- 04 02:52 Aldebaran 2.0°S of Moon
- 06 18:25 Jupiter 5.4°N of Moon
- 07 04:31 **FQ MOON** rises locally at 12:42 pm DST
- 08 10:52 Moon at Apogee: 404 503 km
- 08 16:00 Mars at Opposition** mag. = -1.47, 15" diameter.
- 10 21:26 Regulus 5.2°N of Moon
- 14 14:24 Mars 3.5°N of Moon
- 14 23:57 Spica 1.7°S of Moon
- 15 03:42 **FULL MOON Total Lunar Eclipse; mag=1.296**
- 17 03:42 Saturn 0.4°N of Moon: Occn. (not vis. locally)
- 22 03:52 **LQ MOON** rises locally at 2:33 am DST
- 22 13:00 Lyrid Meteors, 20/h peak 1 pm, Moon 46% illum.
- 22 20:27 Moon at Perigee: 369 765 km
- 25 19:16 Venus 4.4°S of Moon
- 25 23:00 Mercury at Superior Conjunction
- 29 02:04 Non-Central Annular Solar Eclipse; mag=0.982
- 29 02:14 **NM** rises locally at 6:34 am DST

BAS Events

- Apr 2** Wed **BAS meeting:** Grey Roots Museum, 7 pm, regular meeting will follow our speaker, Dr. Mary Shouldice, optometrist. Topic: "Eyesight and the Aging Astronomer"
- Apr 5** Sat (FQ-2) **BAS viewing @Fox@dark** (optional viewing this month -see Apr 15 and Apr 26 for other viewing events this month)
- Apr 15** Tue (FM) **TOTAL LUNAR ECLIPSE** -best one for 2014 umbral contact 1:58 am DST Apr 15, total phase from 3:06 am DST to 4:24 am Apr 15. Last umbral contact at 5:33 am DST, Moon sets 6:46 am DST Apr 15. Observing from ES Fox Observatory.
- Apr 26** Sat (NM-3) **BAS viewing @Fox@dark** (optional viewing)

Special Events

BEST Lunar Eclipse of 2014: Apr 15

The best total lunar eclipse of the two for 2014 breaks a "dry spell" of more than several years. The most recent total lunar eclipse (clouded out locally) was Dec 21, 2010. For a successfully observed eclipse in Bruce-Grey one needs to go back to Feb, 2008! The Apr 15 event described here will be the first opportunity BAS will have to view a lunar eclipse from the Fox Observatory. The diagram below gives the key times for this early morning eclipse. Note the first contact of the dark central shadow of the Earth (umbra) occurs just before 2 am Apr 15. Partial phase lasts until totality starts at 3:06 am and the total phase lasts for 1h 19 minutes until 4:25 am. After that it is partial phases until the last umbral shadow departs the Moon 5:33 am. The important figure not given in this diagram is the lunar elevation. Thankfully, the Moon is well up at the start (34°) and drops to 11° at 5:33 am. Lots of room above the horizon and lots of time before sunrise at 7:22 am. Don't miss it!

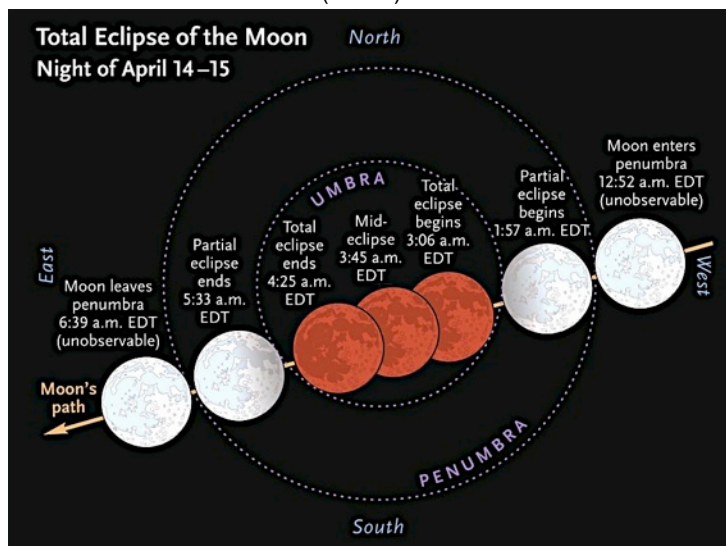
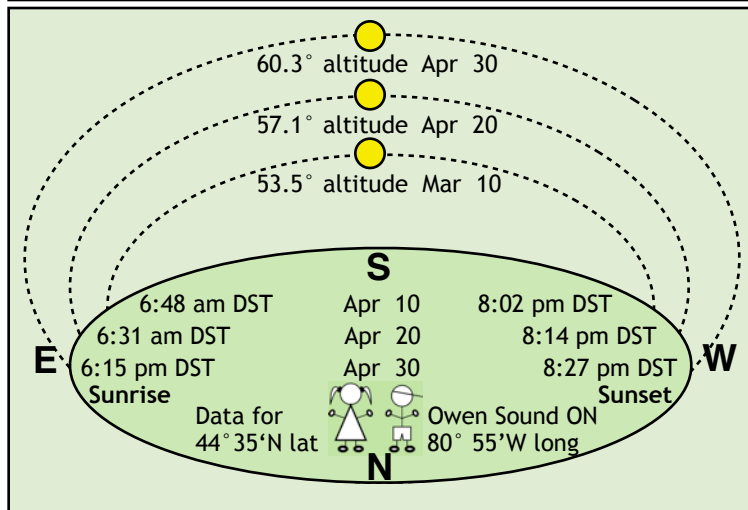


Diagram from Sky & Telescope

Planets

MERCURY, is a difficult if not impossible target this month as it continues hugging the horizon at dawn getting closer to the Sun. It passes behind the Sun on Apr 25. **VENUS**, is a prominent Morning Star at magnitude -4.3 and is gradually increasing its elevation above the horizon. A thin last crescent Moon is close to Venus on Apr 25 and 26 and Neptune is less than a degree away on Apr 12. **MARS** (mag. -1.5) rises at sunset and is visible until dawn near Spica in Virgo. The Red Planet is largest for the year (15" of arc) at its Apr 8 opposition. **JUPITER**, (-2.1) is high in the West by sunset and sets just after midnight by month-end. It is in a prime location for evening viewing all month. **SATURN**, (mag 0.2) rises 3 hours after Mars does in April and is well up by midnight. Ring tilt drops to just below 22° by the end of April. Both **URANUS**, (5.7) and **NEPTUNE**, (7.8) struggle in the dawn twilight ahead of sunrise this month. Uranus does worse than Neptune which manages a close pass (under 1°) to Venus on Apr 12. Both **asteroid, Vesta (5.4)** and **dwarf planet, Ceres (6.5)** are pacing each other as they retrograde in Virgo very close to Mars. Charts are available on the BAS website. **PLUTO** (mag. 14) is in dark sky for a few hours before dawn this month with viewing in the first two weeks of April better than the last two when the Moon is nearby. Pluto finder charts for 2014 are now found on the BAS website.

The diagram below gives the sunrise/sunset times and the Sun's altitude on three dates this month. The Sun continues climbing in the sky as it heads for the June 21 Solstice. Happy Spring!



April 2014

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
6	7 FQ	8	9	10	11	12
13	14	15 FM	16	17	18	19
20	21	22 LQ	23	24	25	26
27	28	29 NM	30	By permission Univ. of Texas McDonald Obs.		

BAS Member Loaner Scopes

Solar H-alpha scope now out on loan.

Our Lunt solar scope can be borrowed by BAS members but there is a waiting list! Contact Aaron to get your name on it. We now have a suitable mount for it as well. A short training session will be provided on pickup.

TWO 12-inch Dobs available.

Both 12-inch loaner telescopes are available for the summer. Our two **8-inch dobsonians** are presently out on loan. Contact Brett T. or Aaron T. to check on availability. Scopes come in and out periodically so keep checking with Brett or Aaron if you are interested in a loaner.



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2 element E.D. Refractor, 2.7" / 70mm diameter. f.l. 480mm, f/6.8. with 1-1/4" Star Diagonal, with 45 degree Prism diagonal (for terrestrial viewing), with TeleVue Red dot finder, complete with TeleVue Soft Case. Asking \$ 700.-- Firm Anton VanDijk 519 376-9912 ravand@rogers.com



FOR SALE: 16-inch mirror cell

Aluminum 18-point suspension mirror cell for 16 inch mirror (will accommodate 14 in). Comes with central cooling 12 V DC computer fan. Additional cooling fans available \$5 ea. Asking \$100 for cell. Contact John H. 519 371-0670 stargazer@wightman.ca

FREE: Mirror-grinding machine to a good BAS home



The mirror-grinding machine is still available. Note that it is not finished but plans are available from Mirror-o-Matic.com. Designed to do 12 inch mirrors but will handle smaller mirrors with some minor adjustments. BAS also has pretty much complete kits of abrasives and maybe even a mirror blank or two that we will include with the deal. Comes with documentation and a copy of Edmund Scientific Co. Mirror Grinding booklet. Note this outfit is free to current BAS members but if you are not a member, then you can purchase the unit for \$120 and we will throw in a year's membership. Contact (stargazer@wightman.ca)



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