



*Astronomy News for Bluewater Stargazers  
Vol 7 No. 5 May 2013*

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## Astronomy Photo Contest 2013

The contest is open to BAS members as well as non-members. There is no restriction on where the image was taken. Images should have a clear astronomical connection.

Contest submissions should be made before midnight, Nov 30, 2013. Images will be displayed at the BAS meeting Dec 4, 2013. Winners will be announced in the January issue of SGN and prizes mailed or distributed at the March meeting 2014.

There are no entry fees or entry forms. Email your submission to [contact@bluewaterastronomy.info](mailto:contact@bluewaterastronomy.info) before Nov 30, 2013 in JPEG format only. Please keep e-mail files under 2MB per file. Files can also be submitted on CD by regular mail to: John Hlynialuk 635 1st St E, Owen Sound, ON N4K 6C4.

Image processing is permitted but should be limited to minor enhancement, noise and hot pixel removal. Composite images (for example, those with foregrounds added digitally) are not allowed but stacking images is fine. Deep sky images with dedicated CCD cameras that take RGB filtered images can be processed in the usual way and are acceptable. Judges can disqualify any image if it is deemed over processed. Your images may be published in subsequent



### Planet Trio of 1991

This image of a "Planet Trio" was taken in Shallow Lake from my backyard on Jun 17, 1991. Venus (brightest), Jupiter (below Venus) and Mars (faintest) were grouped with a nice crescent on June 16, but it was cloudy. The June 17 triangle had a nice auroral ray as well. You can just see two stars of Cancer below the group. This is a digital scan of a slide taken with an Olympus OM-10 camera, f/1.8 lens, focal length 50 mm on Fuji-400 slide film. Remember those days?

Planet trios happen every few years, but the good ones (not too near sun, high at sunset or sunrise, etc.) occur more like once a decade. The next good one happens this month, from May 22 to May 30 (tightest group on May 26) with Venus, Jupiter and Mercury in the western sky. See page 9 for details. More images in May/June SkyNews magazine.

editions of SGN and/or displayed on the BAS website.

Submitting images to the contest constitutes your giving permission to display those images on the website, in SGN or at presentations by BAS exec at meetings, in fundraising presentations, display, etc. Credit for the images will be provided in all such situations. Please include as many of the following details as possible: camera make and model, lens (or telescope), focal ratio, ISO setting, exposure time, location and date. Include your name, phone number and a valid email address. **See Technical Rules on our website for how to name your images.**

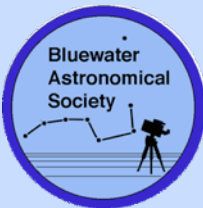
Categories are: (you can submit up to 3 images in each)

1. Deep Space (DS) i.e. long exposure, stacked, RGB image processed
2. Lunar / Planetary (LP)
3. Unguided Tripod (UT)
4. Best cellphone, tablet or point and shoot camera image (CP)
5. Best photo taken by a person under age of 18. (U18)

Have fun, submit often!



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### BAS Executive 2013-2015

<b>President:</b>	Aaron Top	aarontop@hotmail.com
<b>Vice-President:</b>	John Hlynialuk	stargazer@wightman.ca
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<b>Past-President:</b>	Brett Tatton	bretttatton@gmail.com
<b>Membership:</b>	David Skelton	dskel@golden.net
<b>Public Outreach:</b>	TBA	



### BAS Events for May 2013

- May 1 BAS meeting** Grey Roots Museum 7 pm Speaker: Brian Reis "Astronomy and Weather"
- May 4 (LQ+2) BAS viewing@Fox;** @dark, backup May 11 (NM+1)
- May 5 (LQ +3 η-Aqu meteors** ES Fox @dark, moon last crescent, 60/h, peak 2 am
- May 10 (NM) Public viewing** Grey Roots Museum 9 pm (Members with scopes appreciated)
- May 11 BOEC re-union** BOEC Dining Hall starts 1 pm, RASC DSP plaque presentation
- May 22 - May 30 Planet trio** in west (Venus, Jupiter, Mercury) best May 24 to 26
- May 25 AstroCATS** (not a BAS event but interesting anyway) see pg 12.

### New BAS executive for 2013 to 2015 is:

- President:** Aaron Top
  - Vice-President:** John Hlynialuk
  - Secretary:** Lorraine Rodgers
  - Treasurer:** Cheryl Dawson
  - Past-President:** Brett Tatton
  - Past-Past President:** Dan Gieruszak
  - Membership Chair:** Dave Skelton
- Welcome to the new members on exec and Thank You to those who served in the past!

## Photo Contest Help

Here are a couple of resources if you have an interest in astrophotography and are new to the game. Sky and Telescope has a series of online videos (see below), one of our members provides examples (and help) with your work (Richard Porter [www.richardporter.ca](http://www.richardporter.ca)), and I have copies of two Jerry Lodriguss' CD-ROMs "A Guide to Astrophotography with Digital SLR Cameras" and "Photoshop for Astrophotographers". Contact the editor if you are interested in borrowing any of these.

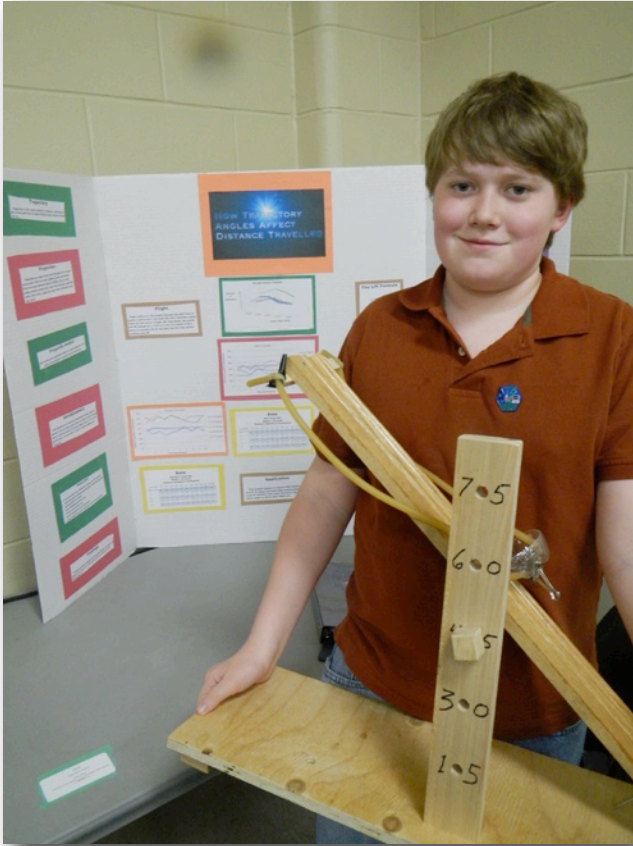


"The Angry Cowboy": While attempting to photograph an aurora that never happened Apr 26 from my usual spot on the east side of Owen Sound, the moon rose through clouds and contrails in the east. The "Angry Cowboy" face was not visible to the eye but showed up on the LCD screen of the camera. The camera also recorded the faint halo around the moon as well as an equally faint moon dog in the lower left. Saturn is right of the cowboy's chin and Spica is upper right. Canon 60D, 10s, 17 mm, ISO1000

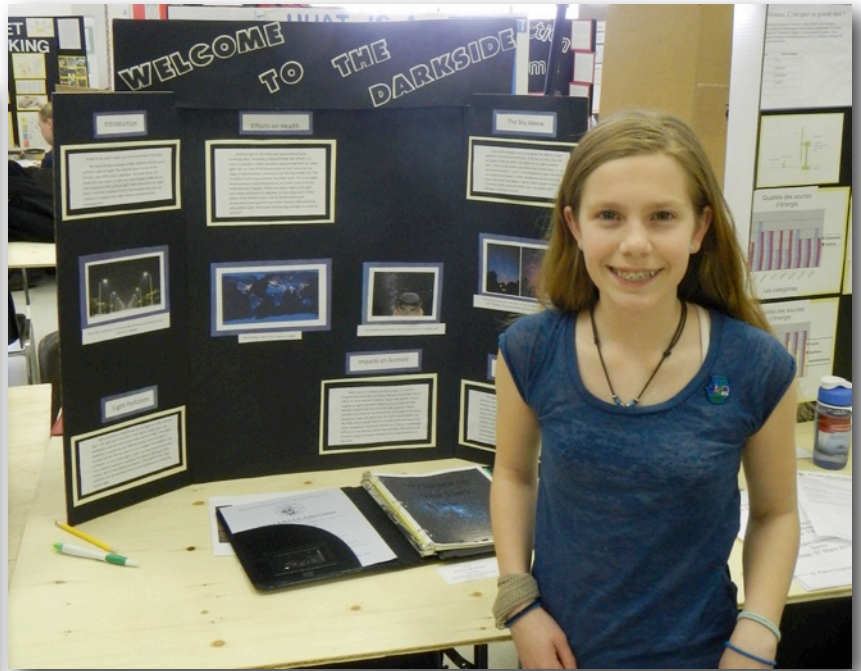
Sky & Telescope now offers a series of tutorial videos on astrophotography with expert Sean Walker using popular software like MaxIm DL, CCDstack, Registax and Adobe Photoshop. See <http://www.skyandtelescope.tv/videoscategory/online-classes/>

[www.richardporter.ca](http://www.richardporter.ca)

## Science Fair winners 2013



James Adams shows off his Science Fair project at the Bluewater Regional Science and Technology Fair held on Apr 10.



Gabrielle Hatten (above) of Kinghurst Community School (Chesley) received the BAS Astronomy Award at the Bruce Regional Science and Technology Fair (Sr division) on April 3. Her project was entitled "Welcome to the Darkside" and examined the effects of excess nighttime illumination. James Adams, (left) received the Jr fair Astronomy Award for studies into how elevation of projectiles affected the distance an object travelled. The best angle is still 45°. Photos kindly provided by Peter Thor of BCRSTF

## Horoscope for April: Taurus

You are brooding emotion incarnate. One minute you're up, the next you're down, the next you've shot your favorite newscaster in the kneecaps, "just 'cuz.". You're very earthy, which may mean that you don't shower as often as most people. Or it may just mean that you like to roll around with your nose in clover and sigh. Taureans love happy movies where everyone is jolly and having fun, but they fight with waiters and get upset with billboards. They like to psychoanalyze their friends but have no real experience with life in general. Taureans mumble while describing philosophical concepts. The Taurus is a strange bird because he or she holds grudges about things that never actually happened. This may stem from the feelings of inadequacy resulting from being beaten out for first in line in the zodiac by Aries. That is the Taurean self-image, always second best. However, they are undoubtedly the best at feeling like second best. All Taureans want to be God. Unfortunately, God is an Aries. You are generally tough to figure out because you answer every question with a question. Also, you won't come out from under the bed. Most Taureans love conflict. If nothing is wrong, then that in itself is something wrong. Some especially like bar fights. If they can't get into an actual bar fight, they will make up interesting stories about them which they can tell their friends right before they psychoanalyze them. If it weren't for Bazooka Joe and The Family Circus, Taureans wouldn't know what to do. You feel that you are going nowhere in life. You are probably right. Milwaukee is full of Taureans. Taureans are impatient and pushy. They are in a tremendous hurry to get to the nowhere that they intend to go to. They make little dioramas of their homes, complete with tiny effigies of the people they know, and act out scenarios of the way things would be if they were God.

## Astronomy Week Events

Weather put a serious damper on Astronomy Week events this year. The generally rainy and cold first part of April did not put anyone in the mood for going out to enjoy the night sky. Furthermore, the snow being driven horizontally by wind on Astronomy Day forced our public outreach activities at OS City Hall to be cancelled. We also postponed the evening viewing session to Sunday night even though we knew there would not be a big public attendance.

Still a keen BAS group set up telescopes at the Grey Roots museum Tuesday Apr 16 for looks at the Jupiter and the crescent moon as well as Comet PanSTARRS. This comet seems to be the Energizer Bunny comet that just won't go away. It was observed Tuesday night Apr 16, April 17 in the morning, Apr 20 in the morning and again Apr 21 in the evening and morning by various BAS observers. My Apr 21 view around 1:30 am was through an open window. I did not even have to go outside. It was about 8th magnitude and very faint in binoculars.

Apr 16 at the BOEC, an elementary class from Hanover was treated to Jupiter in Aaron's refractor, the ISS passing overhead and video camera views of a crescent moon. The highlight, however, was when a jet passed right through the field of view as we watched! I have seen birds but never in 40 years of stargazing has a jet plane crossed the face of the moon while I had my eye at the eyepiece.

A half dozen BAS members appeared Sunday evening Apr 21 at the Fox to observe Jupiter through different scopes, the ISS pass overhead at magnitude -3.4, the Pleiades, the Beehive, the gibbous moon by videocam and finally Saturn when it got high enough to give a steady image around 11:15 pm or so.

So, there were a few highlights during Astronomy Week 2013, but this was not a typical year. Thank you to all BAS members who came out to share their interest in the hobby!



The researchers discovered the crater two summers ago while exploring the area by helicopter for the Natural Resources Canada (NRCan) Geo-Mapping for Energy and Minerals program, and it took two years to properly assemble the geological maps and submit their article for publication. Pratt and Dewing named the new discovery the Prince Albert impact crater after the peninsula where it is situated.

Evidence suggests the crater is younger than about 350 million years but older than about 130 million years. "Several geologists visited that area in the '60s and '70s," said Pratt. "It was those old industry reports of steeply tilted strata, unusual in the western Arctic, that had us intrigued. Unless you recognized the telltale clues, you wouldn't know what you were looking at. You might see a bunch of broken rocks and wonder how they got there, but we found abundant shatter cones. These are radiating crack surfaces up to a metre in size that are formed from the enormous amount of energy created when a meteorite slams into the Earth's crust. Our map showed that the feature is circular which is characteristic of impact craters. It's an exciting discovery."

There are at least 160 known meteorite impact features on Earth, 30 in Canada, 29 in the US and 1 (Chicxulub) in Mexico. For maps and additional photos, visit the [U of S Flickr gallery](#).

## The Return of Saturn: A Guide to the 2013 Opposition

by DAVID DICKINSON (APRIL 8, 2013) [www.universetoday.com](http://www.universetoday.com)

A star party favorite is about to return to evening skies. The planet Saturn can now be spied low to the southeast for northern hemisphere observers rising about 2 hours before local sunset in May. Opposition occurred April 28<sup>th</sup> but Saturn still shines at magnitude +0.1 and appear 18.8" in diameter excluding the rings, which give it a total angular diameter of 43". Both the 2013 and 2014 opposition will occur in Libra. Saturn will also pass 26' from +4.2 Kappa Virginis on July 3<sup>rd</sup> as it moves back into Virgo while in retrograde before resuming direct motion back into Libra. With an orbital period 29.46 years, Saturn moves slowly eastward year to year, taking 2-3 years to cross through each constellation along the ecliptic.

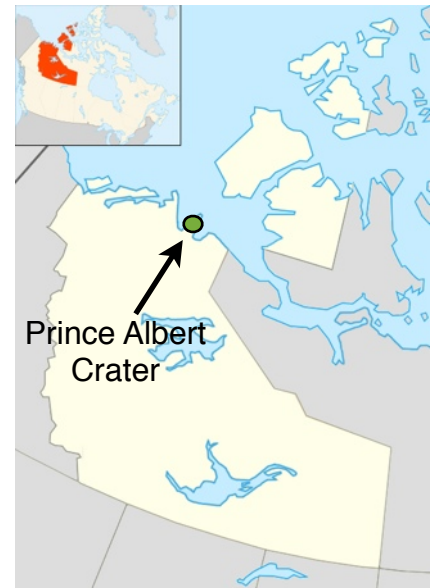
Saturn currently lies about 15° to the lower left of the +1.04 magnitude star Spica, also known as Alpha Virginis. Remember the handy saying to "Spike to Spica" from the handle of the Big Dipper asterism to locate the region. Another handy finder tip; stars twinkle, planet generally don't. That is, unless your skies are *extremely* turbulent!

Oppositions are roughly 378 days apart and thus move forward on our calendar by about two weeks a year. Successive oppositions also move about 13° eastward per year. Saturn will be with us for most of the remainder of 2013 in evening skies until reaching solar conjunction on November 6<sup>th</sup>.

## Canada's 30th Astrobleme

Researchers from the University of Saskatchewan and the Geological Survey of Canada (GSC) have discovered a massive meteor impact from millions of years ago in Canada's western Arctic. Located on the northwestern part of Victoria Island, the impact crater, or astrobleme, is about 25 km wide and is Canada's 30th known meteorite impact feature.

"It's another piece of the cosmic Earth puzzle," explained U of S geology professor Brian Pratt, who made the discovery with GSC colleague Keith Dewing. "Impact craters like this give us clues into how the Earth's crust is recycled and the speed of erosion, and may be implicated in episodes of widespread extinction of animals in the geological past."



### SaturnMoons

If you own an Apple device, Sky& Telescope's SaturnMoons is available at the App Store for \$2.99. It displays a view of Saturn, its rings, and its moons at a particular time or any time and date you set. There are options to flip it vertically or horizontally to give views through a scope, a red night light feature and you can zoom in/out as usual on iPods or iPads.



View in iTunes



Looking at Saturn with binoculars, you'll immediately note that something is amiss. You're getting a view similar to that of Galileo, who sketched Saturn as a sort of "double handled cup." In fact, it wasn't until 1655 that Christian Huygens correctly hypothesized that the rings of Saturn are a flat disk that is not physically in contact with the planet. Huygens also discovered the large moon Titan. Shining at magnitude +8.5 and taking 16 days to orbit Saturn, Titan is the second largest moon in our solar system after Ganymede. Titan would easily be a planet in its own right if it orbited the Sun. Titan is easily picked out observing Saturn at low power through a telescope.

(cont'd next page)

Observing Saturn at slightly higher magnification, five moons interior to Titan become apparent. From outside in, they are Rhea, Dione, Tethys, Enceladus, and Mimas. Exterior to Titan is the curious moon of Iapetus. Taking 79 days to complete one orbit of Saturn, Iapetus varies in brightness from magnitude +11.9 to +10.2, or a factor of over 5 times. Arthur C. Clarke placed the final monolith in the book adaptation of *2001: A Space Odyssey* on Iapetus for this reason. Close-ups from the Cassini spacecraft reveal a two-faced world covered with a dark leading hemisphere and a bright trailing side, but alas, no alien artifacts.

But the centerpiece of observing Saturn through a telescope is its brilliant and complex system of rings. The A, B, and C rings are easily apparent through a backyard telescope, as is the large spacing known as the Cassini Gap. The rings are also currently tilted from our Earthly vantage point. The rings were edge-on in 2009 and vanish when this occurs every 15-16 years.

This year, we see the rings of Saturn at a respectable 19° opening and widening. The rings will appear at their widest at over 25° in 2017 and then become edge-on again in 2025. The ring system of Saturn adds 0.7 magnitudes of overall brightness to the planet at opposition this year.

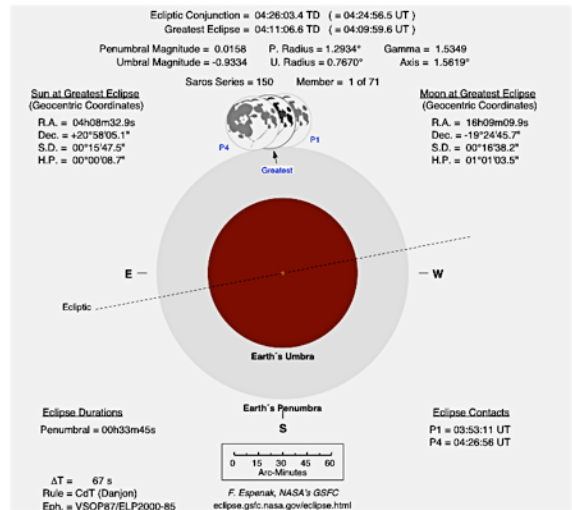
Another interesting optical phenomenon to watch for in the days leading up to opposition is known as the "opposition surge" in brightness, or the Seeliger effect. This is a retro-reflector effect familiar to many as high-beam headlights strike a highway sign. Think of the millions of particles making up Saturn's rings as tiny little "retro-reflectors" focusing sunlight back directly along our line of sight. The opposition surge has been noted for other planets, but it's most striking for Saturn when its rings are at their widest.

The disk of Saturn will cast a shadow straight back onto the rings around opposition and thus vanish from our view. The shadow across the back of the rings will then become more prominent over subsequent months, reaching its maximum angle at quadrature this northern hemisphere summer and then beginning to slowly slide back behind the planet again. A true challenge is to glimpse the disk through the Cassini gap in the rings... you'll need clear steady skies and high magnification for this one!

Saturn takes about 30 years to make its way around the zodiac. I remember just beginning to observe Saturn with my new 60mm Jason refractor as a teenager in 1983 as it crossed the constellation Virgo. Hey, I've been into astronomy for over one "Saturnian year" now... where will the next 30 years find us?

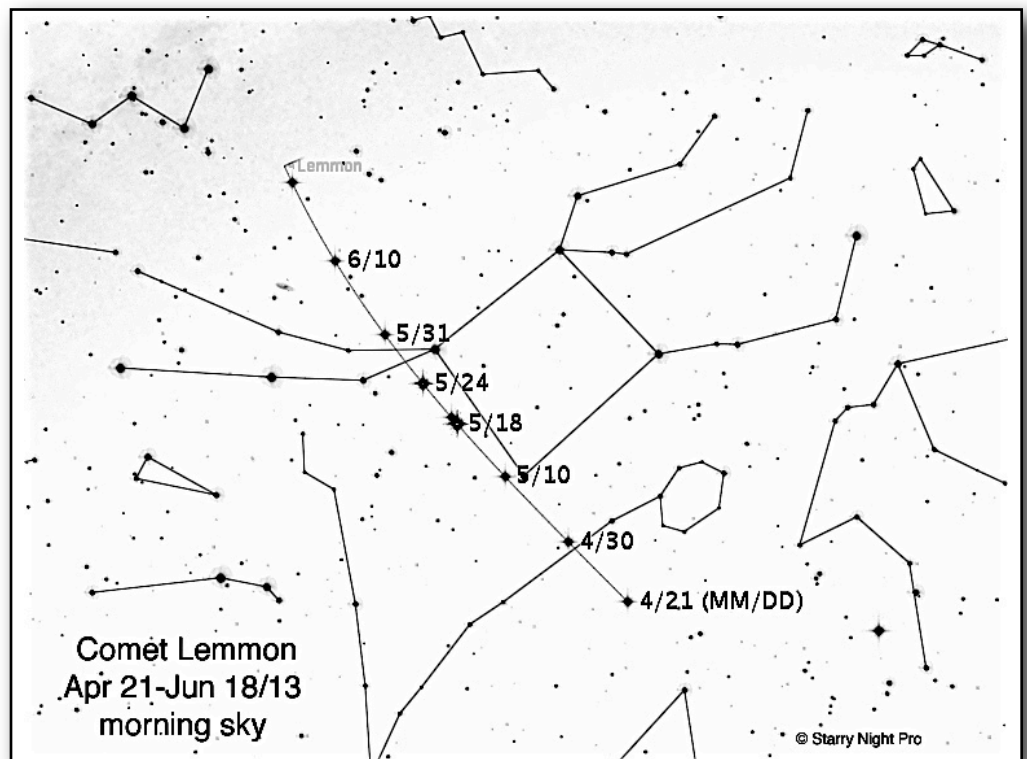
Read more: <http://www.universetoday.com/101290/the-return-of-saturn-a-guide-to-the-2013-opposition/#ixzz2PzVE9g96>

### May 25 Near-Miss Lunar Eclipse (forget about it...)



## Comet Lemmon Crosses into Northern Skies

Like PanSTARRS, Comet Lemmon (C/1012 F6) will pose some challenges for viewing for northern observers. It will be low in the morning sky, and fading as it moves away from the sun over the interval from mid-April into May and June. It has been easily observed by southern stargazers as the many images, (including APOD) show. At time of publication, Lemmon is magnitude 4, with a long ion tail showing up on photos (9° long on Mar 14). It will fade as it enters the northern sky but hopefully the green colour will persist. The opportunity to view is limited because Lemmon stays near the sun and the horizon just like PanSTARRS did earlier. It is doubtful that the comet will get above naked eye visibility while in northern skies. The chart shows its location from Apr 21 on but the dawn horizon is not shown. At sunrise around 6:30 am Apr 21, the comet is 10° above the horizon but not visible in the bright sky. Lemmon rises at 5:30 am and is 5° high at 6:00 am so there is a very small window to observe during dawn twilight. Once again, good luck with your observing, and photos would be appreciated. [No, the chart is not a mistake, Lemmon is following almost the same path as PanSTARRS.



## A Prolonged Messier Marathon

(written Mar 21, 1999) by John Hlynialuk  
[with minor changes]

I observed my 110th Messier object -M83 on April 14, 1982 at 12:30 am. It was not a Messier Marathon event but a night when I decided to finish off the last 6 or so and complete my personal list. Doug Cunningham and I had a friendly rivalry going to see who could finish the list first but there was nothing riding on the outcome other than our satisfaction of having seen all 110 objects. We spent a lot of time at each other's "observatories" (that's what we called our backyards then) showing the other guy a Messier object or two or revisiting old favourites. I don't know how many times we viewed M11 through my 12-inch, but it was a treat every time. [At the completion of my Messier list in 1982, I had seen it 19 times. Add another couple of dozen times to that as of 2013.]

We eventually noticed that our life list of objects included a lot of Messier objects (many seen multiple times) and so Doug suggested to me to make a competition of it. There was even some talk of claiming a Messier Certificate offered by the RASC. The goal of racking up all 110 Messier's was reached pretty well simultaneously (I think Doug was actually first by a night or so) and the event for both of us passed without any real terrestrial fanfare. After the congratulatory phone call, we toyed with the

idea of viewing the Observers Handbook's short list of bright NGC objects but neither one of us really committed to this project and I, at least, have not even started any systematic searching. Neither of us ever did apply for the Messier Certificates.

The spring that Doug and I finished the Messier list was an especially good viewing year for me and I remember it more for views of planets and other objects than the climax of finally racking up Messier No. 110.

That last night April 14, 1982 was an average night of viewing that included a "romp" through the Realm of Galaxies (thereby completing the list) as well as views of Mars, Jupiter and Saturn. Those three planets were lined up nicely along the ecliptic in Virgo and were well clear of the horizon by midnight. That spring was a year for planet viewing much like the planet parade of 1998-99 in the west. [See Special Events pg 9 for another planet grouping to observe -ed]

So, although I admire those brave souls willing to attempt all 110 Messier objects in one session, I sometimes wonder about the point of it all. Messier's objects or anyone else's list is just a collection of things to see in the night sky but the risk is that we focus too intently on adding "notches" and forget the real pleasure of astronomy. Perhaps observing whatever targets present themselves to your telescope as your interests and abilities (and telescopes) change with time, is a more sane way to enjoy astronomy that to make it into an endurance contest on one night. I certainly enjoyed the many times I "re-viewed" a

favourite Messier object at my leisure. They never looked exactly the same. M13 always took my breath away and the Andromeda Galaxy always had more details to reveal as the seeing conditions varied. The dozens of nebula and clusters in the summer Milky Way always kept me up into the wee hours of the warm summer mornings. I will never forget those views through the O-3 filter.

I hope marathoners don't get so focused on the contest that they don't take enough time to thoroughly enjoy the view. It would be worse if they "burned themselves out" and then didn't return to re-observe some of the best Messier's having done it all in one strenuous night of observing one target after another.

The RASC Observer's Handbook lists the Messier objects visible by season -there are four groups as a result. My suggestion is that you attempt to view as many (or all) of those listed by Alan Dyer for each season and savour each one. You should view your favourites of the season more than once and maintain a mental short list of those you want to see again over the years. And don't forget about all the other stuff that is up there as well.

PS. Did you know that the winter sky has only one globular cluster to view (M79) and it is not that conspicuous. Even if you wait until midnight to get a preview of spring skies, there are very few globulars to see. The summer sky, on the other hand, is the realm of globulars -do you know why? Submit your answers to the editor.

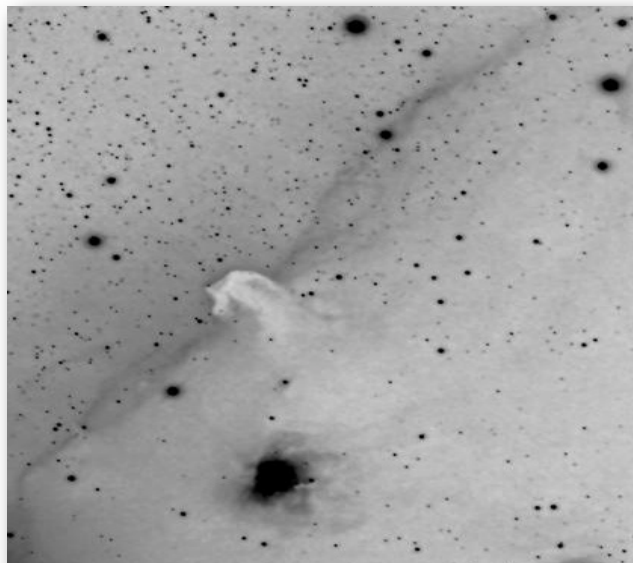


### Leo Triplets

*One of the targets (a three-in-one) in the recent Messier Marathon was the Leo Triplet. This Frank W. image is a total of 90 minutes of exposure through his 85 mm refractor. The visual telescopic appearance of these galaxies is much like this image. The most interesting galaxy is not a Messier object but NGC3628, an edge-on spiral with a prominent dust lane. Left upper galaxy is M66 and left lower is M65, both relatively normal spirals possibly with a weak central bar. Another (fainter) group of three galaxies in Leo is M95, M96 and M105.*

## B33 at the Edge of Light

*“Unbroken the horizon, saving where  
A wreath of smoke curls up the far, thin air ...”*  
Emily Pauline Johnson “Silhouette”



*Silhouette of the B33 - Horsehead Nebula  
Unguided Negative of a Cropped Stack (10x90s) SBIG  
STL 11K on a TAK TOA 150, cooled -20C  
Doug Cunningham Image from ASV on March 1, 2013*

Contrast is everything! Astronomers, both professional and amateur, frequently convert their astro-images into negatives in order to reveal the subtle, wispy details of astronomical objects. The negative image shown above, is of the famous Horsehead Nebula, located in Orion at a distance of 1500 LY from us. It is the thirty-third entry (B33) in Edward Emerson Barnard's catalogue of 370 dark interstellar nebula. This dark nebula is the most easily recognized and iconic of them all! I took this picture on a spectacular, starry night from the backyard of our Arizona Sky Village hacienda. It was one of those nights where lines of faint stars were visible just above and below the famous belt of Orion. I estimated the limiting visual magnitude as 7.5! Sleep would certainly wait and I remember staying up and imaging most of that night. For this picture, I used a cooled monochrome camera (SBIG STL-11K) attached to my 6 inch TAK refractor and had rotated the 5-position filter wheel until the Clear Filter was positioned over the imaging chip. Only later did I convert the resulting B&W image to its negative and then cropped it to isolate the nebular details. Even with an exposure of only 15 minutes, I managed to capture the haunting silhouette of the Horsehead. It was almost 3-D as it appeared to rise out of a “deep well” of interstellar dust/gas and then protrude above a line of glowing hydrogen gas. I really liked the effect!

I certainly enjoy astro-imaging, but, what I like even better, is actually seeing fascinating astronomical objects, like the Horsehead, at the telescope, and with my own eyes. Ask almost any amateur astronomer who has tried to observe the Horsehead and he/she will tell you that it is a real challenge. My image, and those of many others, including the Hubble Space telescope, misrepresent the degree of difficulty in seeing B33 in modest amateur telescopes. The main difficulty is one of low contrast. If there is little contrast between a nebula and its surroundings, then it almost fades into insignificance as it blends with the background. Such is the case with the Horsehead, where the contrast between a foreground dark nebula (Horsehead or B33) and a background bright nebula (IC434) is extremely low. This red, or pinkish,



background glow of the bright nebula IC434, is caused by Hydrogen-Beta light, and it is produced when the nearby bright star, Sigma Orionis, excites IC434's hydrogen gas. The actual horsehead silhouette is caused by thick obscuring nebular dust, which stands out in relief against the background glowing hydrogen gas.

During the Spring of 1998, using my C-14, I finally succeeded in having my first view of the Horsehead Nebula. I approached this observing project like a general planning a military campaign. I called my campaign “Searching for B33 at the Edge of Light”. I knew, right from the start, that if I could increase the contrast between the dark nebula (B33) and bright background nebula (IC434) then I stood a good chance of success. I first purchased a Lumicon Hydrogen-Beta filter. The idea was that the filter would selectively pass the hydrogen-beta light from bright background IC434 and block any light from the darker Horsehead. This should increase the contrast between the two and render the Horsehead visible. In addition to using the H-Beta filter, I reduced the contrast destroying effects of the nearby stars, Alnitak and Sigma Orionis, by positioning them outside the field of view of the C-14. I also studied photos of the area around the Horsehead and memorized its location, relative to these field stars. I then increased my sensitivity to light by sitting in the dark for 30 minutes and then increasing my blood oxygen level by breathing exercises. Finally, I seated myself comfortably at the telescope, relaxed, and gently moved the field of view back and forth using the electric slow motion controls. After a few minutes of doing this I saw, for the first time, the famous Horsehead Nebula, 1500 light-years distant! It certainly was faint!

Readers of this column are probably aware of the “Astronomy Picture of the Day” website. <http://apod.nasa.gov/apod/astropix.html>). On April 22<sup>nd</sup>, 2013, APOD published a most amazing infrared image of the Horsehead Nebula taken by the Hubble Space Telescope. [See image right]. Those interstellar dust clouds of the Horsehead literally billow! It's hard to believe that eventually, this dark nebula, B33, will be dissipated and destroyed by the strong radiation of young stars nearby. I guess that “ashes to ashes and dust to dust” also applies to interstellar nebulae.



*HST IR image of Horsehead (B33)  
posted on APOD April 22, 2013.*

## Canadians Take Part Building World's Largest Optical Telescope

Mauna Kea's peak currently has close to a dozen telescopes. Now add TMT. **Kevan Karanjia, Staff Writer Weather Network**

**April 13, 2013** – The world's largest telescope will soon be coming to Hawaii with the help of Canadian universities after receiving approval from the state Board of Land and Natural Resources on Friday (Apr 12).

Hawaii's Mauna Kea volcano is known as a cultural hot spot that's home to endangered species and is considered one of the best locations for astronomical observation, but soon you'll be able to add the title of host of the world's largest telescope.

Plans by Californian and Canadian universities to construct a 30 meter telescope on the summit of the volcano were approved Friday by Hawaii's state Board of Land and Natural Resources. The decision allows the group behind the project to begin negotiations over a sublease of land with the University of Hawaii, who is involved because they lease the summit land from the state.

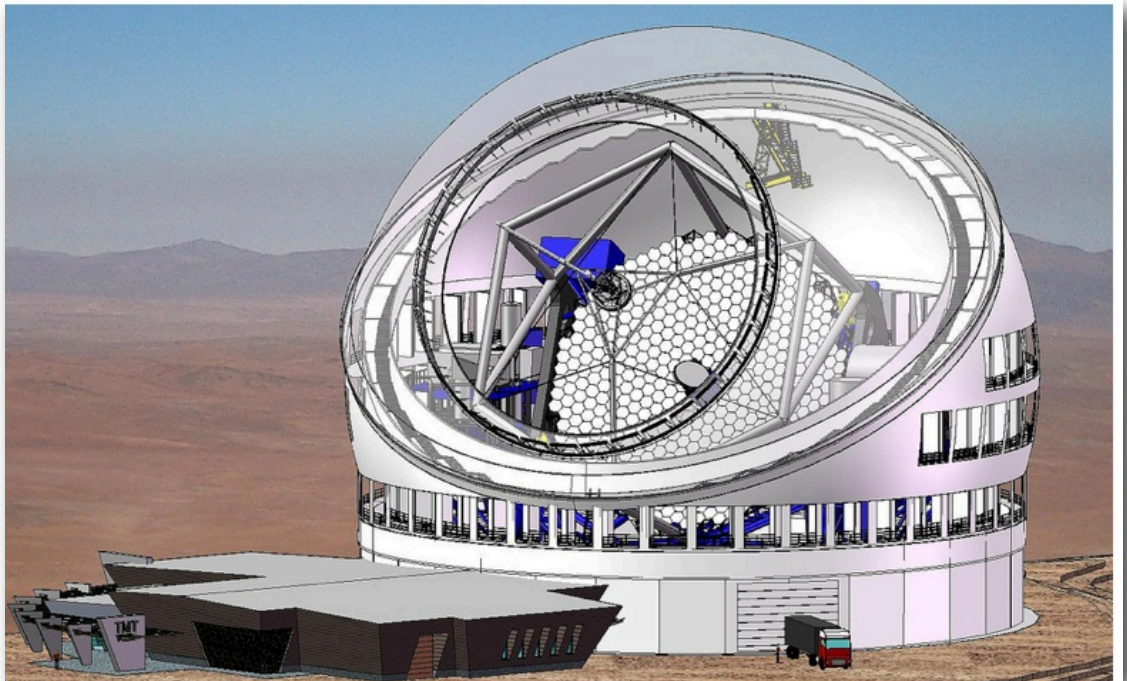
The Association of Canadian Universities for Research in Astronomy is leading the telescope project along with the California Institute of Technology and the Univ. of California - China, India and Japan have signed on to be partners.

Scientists are excited by the news as the new telescope will allow for the study of the universe's early years, with capabilities to see up to 13 billion light years away. The telescope's 30 meter segmented primary mirror will allow images to be three times sharper. Mauna Kea is a popular site for star gazing as the atmosphere above the volcano is extremely dry. This allows for infrared studies to be conducted since there is no water vapor to absorb away radiation. The summit is located in an area where cloud cover is kept low and free of atmospheric pollution. Skies can get very dark as the air is very stable, and favorable laws exist preventing light pollution in the area.

Mauna Kea's peak currently has close to a dozen telescopes.

The telescope's reign as world's largest won't last too long with a group of European countries expected to construct "The European Extremely Large Telescope," with a main mirror diameter of 39 meters.

*Image right shows the largest telescopes currently on Mauna Kea and does not include the CFHT which is out of frame right. Left to right are Subaru 8.3 m, the twin Keck telescopes (10 m each) and the NASA 3.0 m Infra-Red telescope.*



*The core of the TMT Observatory will be a wide-field, alt-az Ritchey-Chretien telescope with a 492 segment, 30 meter diameter primary mirror, a fully active secondary mirror and an articulated tertiary mirror. See <http://tmt.org> for more details.*

Project officials have come under fire from cultural and environmental groups. Some Native Hawaiian organizations are angry the project is being built on sacred ground. Environmentalists aren't happy that the telescope is being constructed on the habitats of endangered species including the Mauna Kea Silversword plant and the Wekiu bug.

Despite the opposition, officials approved the project as long as 12 conditions are met including employees must be trained in culture and natural resources. The total project is expected to cost around \$1 billion (US). Construction should be completed by 2018.



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Ever wondered what a black hole is? or dark energy? How about explaining the Anthropic Principle to your grand kids. Other non-astronomy topics may also pose puzzles for you like what the frack is “fracking”!

The website above provides quick answers (1 min 40 s to be exact) to many questions that may have caught your interest. Check it out (and be prepared for a quiz at the next BAS meeting). In any case, this is great background for the next Trivia Quiz session.

## Canada’s Largest Radio Telescope Being Built

**\$11M UBC-led CHIME project to attempt largest survey of observable universe**

Construction is now under way in Penticton, B.C. on Canada’s largest radio telescope – and the first research telescope to be built in the country in more than 30 years. The new telescope, with a footprint larger than six NHL hockey rinks, will “listen” for cosmic sound waves and help scientists understand why the universe has expanded rapidly. Part of the \$11-million Canadian Hydrogen Intensity-Mapping Experiment (CHIME), the radio telescope is being built at the Dominion Radio Astrophysical Observatory (DRAO) in Penticton B.C.

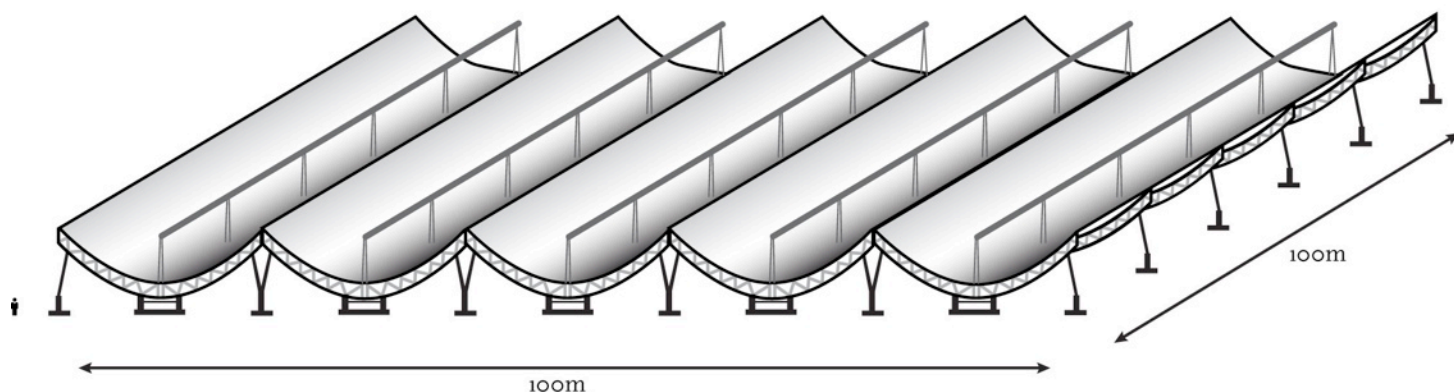
“We plan to map a quarter of the observable universe,” says University of British Columbia astrophysicist Mark Halpern, the project’s principal investigator. “This is an ambitious, made-in-Canada endeavor.” The telescope boasts a 100-metre-by-100-metre collecting area filled with 2,560 low-noise receivers built with

components adapted from the cell phone industry which, collectively, scan half of the sky every day.

“The CHIME telescope will be the most sensitive instrument in the world for this type of research and the DRAO is one of the best sites in the world for this research,” says UBC astrophysicist and project co-investigator Gary Hinshaw, who witnessed the groundbreaking in Penticton yesterday. Signals collected by the CHIME telescope will be digitally sampled nearly one billion times per second, then processed to synthesize an image of the sky.

“The recent discovery that the rate of expansion of our universe is increasing rather than slowing down has forced us to re-examine basic assumptions about what the universe is made of,” says UBC astrophysicist and CHIME co-investigator Kris Sigurdson. “Data collected by CHIME will help us understand the history of the Universe, and in turn how dark energy has driven its expansion,” says Halpern.

CHIME is funded in part by a \$4.6-million investment from the Canada Foundation for Innovation and includes scientists from UBC, McGill University, the University of Toronto and the DRAO. For more information, visit UBC Faculty of Science and Dept. of Physics and Astronomy.



**Leo (Leo)** α-Leonis - Regulus β-Leonis - Denebola  
 γ-Leonis - Algieba δ-Leonis - Zosma  
 ε-Leonis - Asad Australis ζ-Leonis-Aldhafera θ-Leonis - Chort  
 λ-Leonis - Alterf μ-Leonis - Rasalas

Leo is a zodiacal constellation lying south of Ursa Major. It is one of the most beautiful of the constellations and is easily recognized; the stars forming the head of the lion are arranged in the shape of a sickle, or reversed "?." Regulus, its brightest star, has a magnitude of 1.3 and is 19th among the 20 brightest stars in the sky. It lies almost exactly on the plane of the ecliptic and is therefore eclipsed by the sun once a year (on about August 23). τ Leonis, a double star, can be separated with binoculars. A meteor shower, the Leonids, radiates from the head of the lion every year about the 14th or 15th of November.

**DOUBLE STARS**

	Mag.	Sep (s)	Location	Remarks
α	1.5-8.0	177	100612	Pale Blue-White.
γ	2.3-3.5	4	101720	Yellow-Green; one of the most beautiful doubles in the sky.
6	5.3-9.0	37	092910	
7	6.2-9.3	42	093315	
54	4.5-6.3	6	105325	Greenish Wh-Blue; beaut.
88	6.2-8.2	15	112915	
90	6.0-7.3	3	113217	

**MESSIER OBJECTS**

	Mag	Location	Remarks
<b>M65</b>	9.3	111613	Spiral Galaxy.
<b>M66</b>	8.4	111813	Spiral Galaxy.
<b>M95</b>	10.4	104112	Spiral Galaxy.
<b>M96</b>	9.1	104412	Spiral Galaxy.
<b>M105</b>	9.2	104513	Spiral Galaxy.

**Other Objects of Interest in Leo**

**R Leonis** - Long period (313 days) variable, magnitude range 5-11. This star is red in color and is visible to the naked eye at maximum. Location 094512.

**The Leo Triplet** (image pg 6): A nice group of galaxies located just under the rear feet of Leo are a suitable target for all sizes of telescopes. **M65, M66 and NGC3628** form this classic group of spiral galaxies. M65 and 66 are above 9th magnitude and only about 0.33° apart. Both are edge-on. The third member of this group NGC3628 is fainter but larger and in medium scopes shows a prominent dust lane across its length. Starry Night gives this description: "The sight of this lovely trio is a delight under low power in telescopes. M65 is quite large and oval shaped and M66 has a noticeably bright star-like nucleus. A moderate aperture telescope begins to reveal subtle detail."

**The Leo Galaxy Group** The other group is a pair of spirals, **M95 and M96** and an elliptical galaxy, **M105**. The first two are 42 min of arc apart, twice the separation of M65 and M66. The brighter is M95 but M96 is more interesting with a bright core and hints of a bar crossing it, since it is a barred spiral. All three are fainter than the Leo Triplet, being 10.5, 11 and 11th magnitudes respectively. This is an interesting challenge for moderate sized telescopes and will give you an opportunity to test your scope's ability to pick out faint details in these spiral galaxies. These two groups are a nice half dozen to add to your list of observed objects.

**Leo Minor (LMi)**

Leo Minor is a small constellation between Ursa Major and Leo with only 3 first magnitude stars. The brightest, 46 Leonis Minoris, has a magnitude of 3.9. R Leonis Minoris is a long period variable (372 days) with a maximum magnitude of 7.1, location 094235.

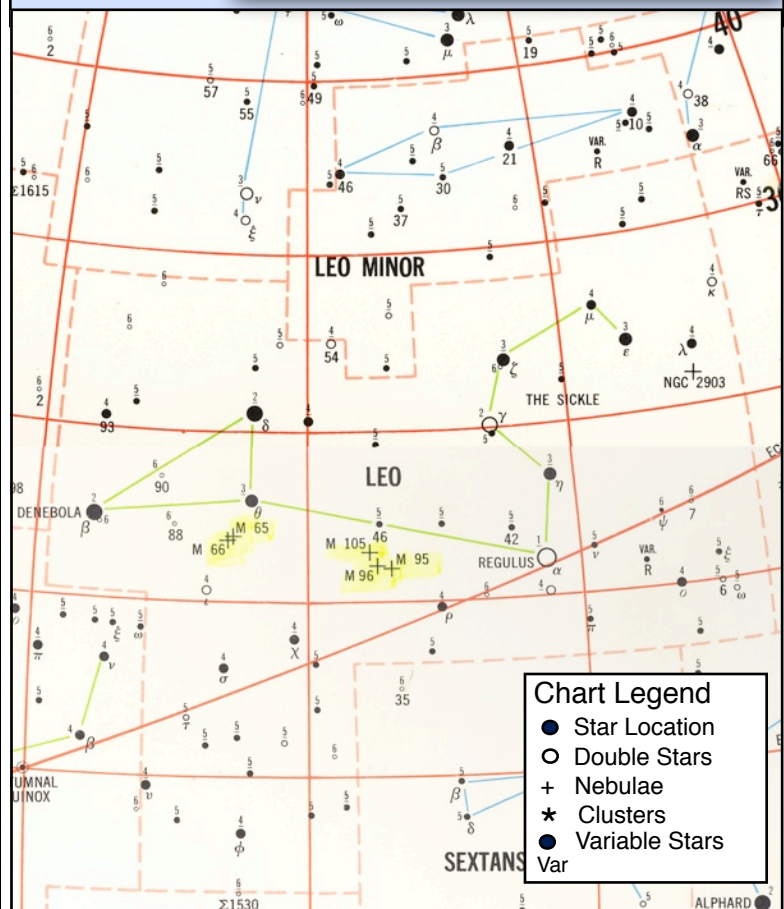
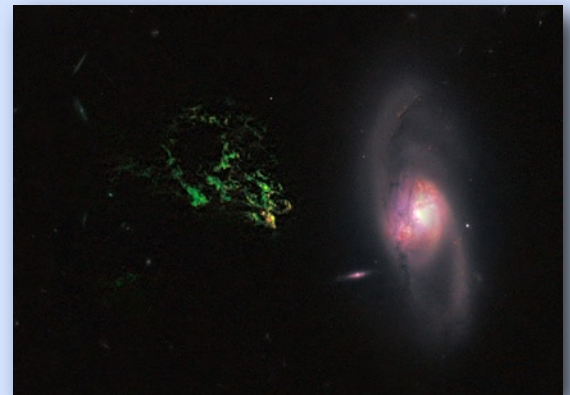
The following information is from Wikipedia:

**DOUBLE STARS**

	Mag.	Sep (s)	Location	Remarks
β Leonis Minoris	4.4-6.1	11	102837	(approx)

**Other Objects of Interest in Leo Minor**

**Hanny's Voorwerp**, Dutch for *Hanny's object*, is an astronomical object of unknown nature. It was discovered in 2007 by Dutch school teacher Hanny van Arkel, while she was participating as an amateur volunteer in the Galaxy Zoo project. Photographically, it appears as a bright blob close to spiral galaxy IC 2497 in Leo Minor. The object is about the size of our MW galaxy and has a huge central hole over 16,000 light years across. In the image, the voorwerp is a false-colour green used to indicate emission lines of glowing oxygen. Both are about 650 million light-years away. Image taken by HST Apr 2010. The nature of the object is still unknown.



- May 2 Last Quarter Moon rises at 2:16 am DST
- May 5 η-Aquarid peak 2am Sun, 60/h, moon Last Cres)
- May 9 New Moon rises at 5:47 am DST  
Annular Solar Eclipse (vis in Australia, S. Pacific)
- May 12 Jupiter 3° N of Moon
- May 13 Moon at apogee (405 825 km)
- May 17 First Quarter Moon rises at 12:31 pm DST
- May 22 Spica 0.005° S of Moon, occultation (not vis. here)
- May 23 Saturn 4° N of Moon
- May 24 Mercury 1.4° N of Venus (part of Planet Trio in W)
- May 24 Full Moon (Planting Moon) rises at 8:33 pm DST  
Penumbral Lunar Eclipse (moon is up in N. America but eclipse is very, very shallow -not an observable event)
- May 25 Moon at perigee (358 377 km)
- May 27 Mercury 2°N of Jupiter
- May 28 Venus 1°N of Jupiter
- May 31 Last Quarter Moon rises at 1:52 am DST

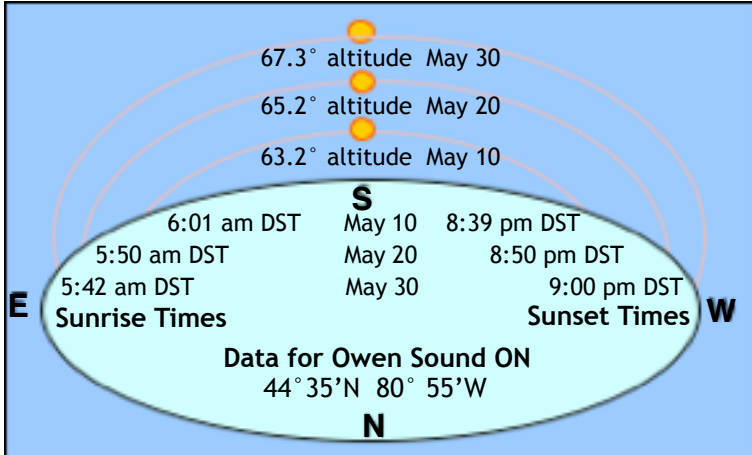
## Planets

**MERCURY**, stays close to the Sun for the first week in May then gradually pulls away for its planet trio encounter with Jupiter and Venus in the last week of May. At that time it brightens to -0.7 magnitude. **VENUS**, (-3.9), is also pulling away from the sun's glare in the western sky and is now truly an Evening Star. **MARS** is still in conjunction with the Sun and not visible until June or July. **JUPITER**, (-2.1) is low in the evening sky in Taurus and is joined by Mercury and Venus from May 21 to 30 for a rare conjunction of three naked-eye planets. See Special Events for details. **SATURN**, (mag 0.2), now rises before sunset and is 35° high on the meridian at midnight. Ring tilt is still 18° or so. **URANUS**, (5.7) rises at 4 am by mid month preceded by **NEPTUNE**, (7.8) at 3 am, but both are in darkness for less than a hour before the sun comes up. Finder charts for the **asteroid, Vesta (7.8)** and dwarf planet, **Ceres (8.1)** can now be found on the BAS website under the MAPS/CHARTS tab. **PLUTO** (mag. 14) is a dawn planet and only 22 degrees high in Sagittarius at the start of morning twilight.

The diagram below gives the sunrise/sunset times and the sun's altitude on three dates this month. The sun continues climbing in elevation this month. The moon calendar below the sun chart shows lunar phases for the month. Times of moonrise for NM, FQ, FM and LQ are in the Sky Calendar listing at left.

## BAS Events

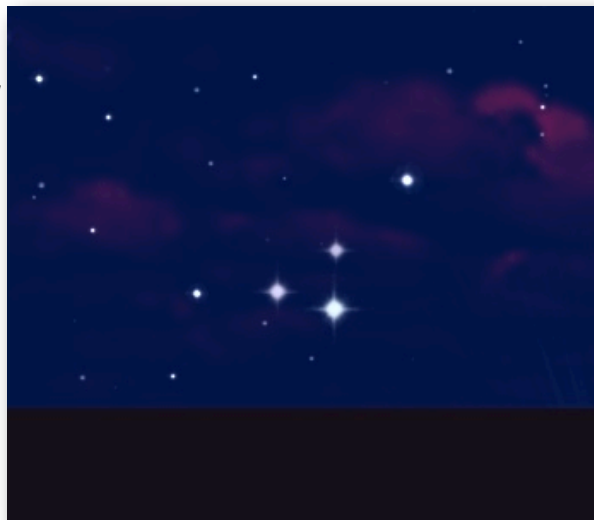
- May 1 **BAS meeting** Grey Roots Museum 7 pm  
Speaker: Brian Reis "Astronomy and Weather"
- May 4 (LQ+2) **BAS viewing@Fox**; backup May 11 (NM+1)
- May 5 (LQ+3) η-Aquarid meteors ES Fox @dark, moon last crescent, 60/h, peak 2 am
- May 10 (NM) **Public viewing** Grey Roots Museum 9 pm (Members with scopes appreciated)
- May 11 **BOEC re-union** BOEC Dining Hall starts 1 pm, RASC DSP plaque presentation
- May 22 - May 30 Planet trio in west (Venus, Jupiter, Mercury)  
best May 24 to 26
- May 25 **AstroCATS** (not a BAS event but interesting) see pg 12.



## Special Events

## V-J-M Planet Trio

Look towards the western horizon from May 22 to May 30 for a rare "planet trio". Venus, Jupiter and Mercury, slide past each other over that time and on May 26, the tightest triangle forms as shown in the Starry Night diagram below. All this happens between the horns of Taurus the Bull, just above the western horizon after sunset. Trios happen on the average every two years or so, but many are too close to the sun to observe. We get one that is placed in a convenient location less often than that. The most famous is the trio of Feb 26, 6 BC involving Jupiter, Mars and Saturn which some Christmas Star historians think explains the "Star of Bethlehem". The upper "star" May 26 is Mercury which moves the quickest changing the shape to a more oblong triangle after then. By May 29, the planets are in a nice line with Jupiter at the bottom, and Mercury at the top. This event heralds the return of Venus as an Evening Star but it is a good opportunity to see Mercury as well. Both planets will show a phase. Don't miss the show!



## May 2013

Sun	Mon	Tue	Wed	Thu	Fri	Sat
By permission University of Texas McDonald Observatory			1	2 LQ	3	4
5	6	7	8	9 NM	10	11
12	13	14	15	16 FQ	17	18
19	20	21	22	23	24 FM	25
26	27	28	29	30 LQ	31	

**BAS Member Loaner Scopes**

**Solar H-alpha scope now available!**

Our Lunt solar scope is now available for loan by BAS members! You need to provide a mount like a heavy-duty tripod, or a regular equatorial or azimuth mount). A short training session will be provided on pickup.

**BOTH 12-inch Dobs now available.**

BOTH 12-inch telescopes are now available for the winter, and we have at least one **8-inch dobsonian** for free member loan. Contact Brett T. or John H. if you are interested. Scopes come in and out periodically so keep checking with Brett or John if you are interested in a loaner.



**SGN Classified Ads Section**

(Now also on our website)



**FOR SALE: Canon EOS 50D DSLR (body only)**

15.1 Mp Excellent noise reduction features for night photos. Includes spare battery and charger, strap, software and manual.

Asking \$ 600. John H. 519 371-0670 [stargazer@wightman.ca](mailto:stargazer@wightman.ca)

Information about the 50D can be found here:

[http://en.wikipedia.org/wiki/Canon\\_EOS\\_50D](http://en.wikipedia.org/wiki/Canon_EOS_50D)

and here: <http://www.imaging-resource.com/PRODS/E50D/E50DA.HTM>

**FOR SALE: Televue Pronto**

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](mailto:ravand@rogers.com)



**New!**



**FOR SALE: Apple iPod 4th Gen. 32 G**

Belkin Case, stylus. Screen protected cover from day 1. Will do everything an iPad or iPad mini does. Note, iPods can be used for email and web access but they are **NOT** an iPhone. Asking \$ 180. John H. 519 371-0670 [stargazer@wightman.ca](mailto:stargazer@wightman.ca)



**RASC Hamilton Centre Presents**



**CANADIAN ASTRONOMY TELESCOPE SHOW**

**Saturday May 25 10:00 AM - 6:00 PM & Sunday May 26 10:00 AM - 4:00 PM**

**Location**

**Sheridan College, Athletics Centre**  
1430 Trafalgar Road  
Oakville, Ontario L6H 2L1

From Shawn Preston, Hamilton RASC re: AstroCATS:

Our goal is to have a fantastic, family friendly astronomy show where both the general public and astronomy enthusiast can go to learn more about astronomy and see a wide variety of equipment at vendor booths. Given the response we've received we expect to have a great turn out, both for our seminars (everything from introduction to astronomy and buying your first telescope, to advanced astrophotography, etc) and the vendors who have already secured booths, such as Celestron, Apogee Imaging Systems, Starizona, OPT, Vixen, etc.

The program includes a Saturday talk by Terry Dickinson and Jim Fitzgerald, retired NASA educator speaking on Sunday.

More information and online tickets are available at <http://www.astrocats.ca/> If you intend to go, purchase tickets online BEFORE May 21 to get a discount.

**Ticket Prices**

	At The Door	*On-Line Purchase
Adults (18 +)	\$ 12.00	\$ 10.00
Children 10-17	\$ 6.00	\$ 5.00
Family (2 Adults + 2 children)	\$ 20.00	\$ 18.00
Children 10 and under FREE		

**NOTE: On-line Purchases must be made no later than May 21 (midnight).**