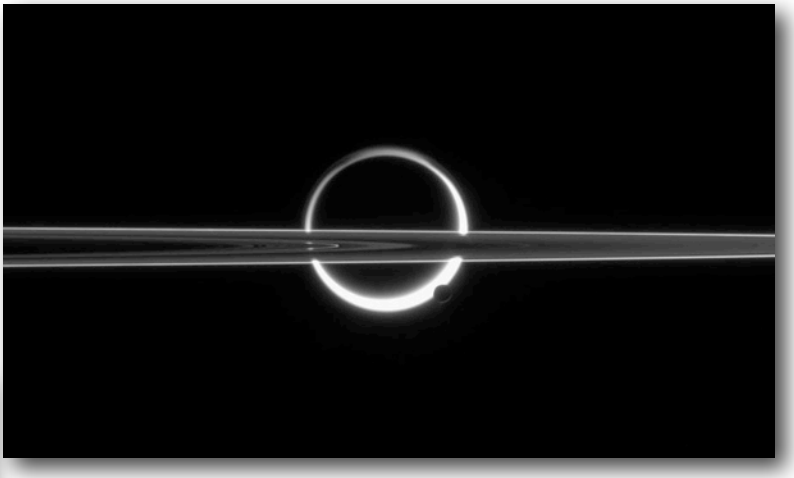
Star Gazer News

Astronomy News for Bluewater Stargazers
Vol 7 No. 9 Sep 2013

Sep 2013 Contents

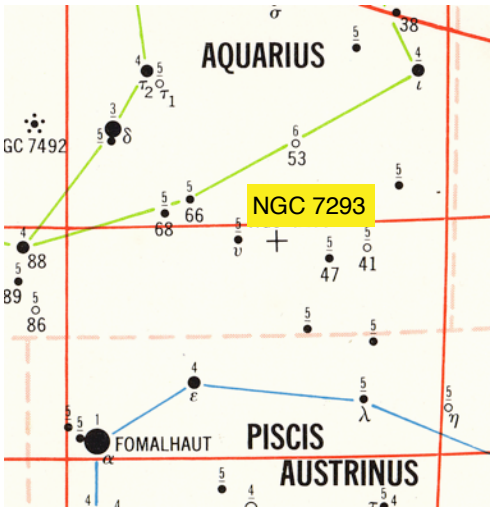


This is not a solar eclipse. Pictured above is a busy vista of moons and rings taken at Saturn. The large circular object in the center of the image is Titan, the largest moon of Saturn and one of the most intriguing objects in the entire Solar System. The dark spot in the center is the main solid part of the moon. The bright surrounding ring is atmospheric haze above Titan, gas that is scattering sunlight to a camera operating onboard the robotic Cassini spacecraft. Cutting horizontally across the image are the rings of Saturn, seen nearly edge on. At the lower right of Titan is Enceladus, a small moon of Saturn. Since the image was taken pointing nearly at the Sun, the surfaces of Titan and Enceladus appear in silhouette, and the rings of Saturn appear similar to a photographic negative. Now if you look really really closely at Enceladus, you can see a hint of icy jets shooting out toward the bottom of the image. It is these jets that inspired future proposals to land on Enceladus, burrow into the ice, and search for signs of extraterrestrial life.

The planetary nebula called the Helix Nebula is also known as NGC 7293 and is located in Aquarius as shown in the chart at right. In the late summer (Sep) it is high on meridian around midnight -an ideal time to observe it from the Fox Observatory!

ESO's Visible and Infrared Survey Telescope for Astronomy (VISTA) has captured this unusual view of the Helix Nebula (NGC 7293), a planetary nebula located 700 light-years away. The coloured picture was created from images taken through Y, J and K infrared filters. While bringing to light a rich background of stars and galaxies, the telescope's infrared vision also reveals strands of cold nebular gas that are mostly obscured in visible images of the Helix.

Credit: ESO/VISTA/J. Emerson. Acknowledgment: Cambridge Astronomical Survey Unit



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Public Outreach:	TBA	

BAS Events for September 2013

Sep 4 Wed **BAS meeting** ES Fox 7 pm Show and Tell and Starfest Recap -bring your stuff to show and stories to tell.

Sep 6 Fri (NM+1) **Public viewing** Grey Roots Museum 9 pm (Members with scopes appreciated)

Sep 7 Sat (NM+2)**BAS viewing @Fox** at dark, backup date Sep 28 Sat (LQ+2)

Sep 8 Sun (NM+3)**Crescent moon near Venus, Spica and Saturn** in West after sunset.

Sep 14 Sat (FQ+2) **OSFN star tour/talk** (private tour) ES Fox 7:00 pm Leader: John H.

Sep 17 Tue (FM-2) **Close approach of Venus and Saturn** in the West after sunset. The two planets are under 3.5° apart and will be spectacular in binoculars.

Sep 28 Sat (LQ+2) **Crescent Moon near Jupiter** today in the morning sky (sep = 5°). Look east before sunrise.

SPECIAL: Sep 28 Chris Hadfield speaks at OSCVI 7 pm. Tickets $100 supporting Meaford Community Hospital available at www.roxytheatre.ca

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!

Chris Hadfield to speak at OSCVI
Sep 28: Info on page 12

From the "Top": by Aaron Top pres. BAS

I hope everyone got to enjoy the Perseid Meteor Shower in 2013. It was awesome. I spent 4 days on Manitoulin Island where it was clear all 4 nights. The evening of Aug 11th into the 12th seemed to be the better of the two nights during the peak. There were meteors flying everywhere the eye could see. About 8 or 10 of us observed and we must have counted over 400 meteors in the 2 nights. I am never good at keeping track of how many I see but it was well into the hundreds by the night's end. My choice of photography was fisheye for fireballs and I did catch one. Also I was using a telephoto lens aimed at deep sky objects around Cassiopeia and anywhere around the radiant of the shower in hopes of catching a close-up of a meteor. It worked! I was able to catch the tail of a meteor and a solid Perseid. These were by far the best two shots, however I did manage to catch around 14 Perseids using the combination of these methods. Next year I hope to use a 10 mm lens on a fixed tripod. -Aaron

[While Aaron was at Gordon's Park, other observer's locally also observed a very good shower. See pg 6 for more.-ed]

Space Station Gets a New Telescope [and its not a Meade -ed]

by NANCY ATKINSON *on* JANUARY 16, 2013 www.universetoday.com

Read more: http://www.universetoday.com/99470/space-station-gets-a-new-telescope/#ixzz2a4Iqq9vR

Astronauts on the International Space Station today are installing a new modified Celestron telescope. This won't be used to observe the stars, but instead look back to Earth to acquire imagery of specific areas of the world for disaster analysis and environmental studies. Called ISERV (International Space Station SERVIR Environmental Research and Visualization System), it is a new remote-controlled imaging system.

"Essentially, it will be pointed out of one of the windows of the Space Station, and used for Earth imaging," Andrea Tabor, social media coordinator for Celestron told Universe Today, "especially for natural disasters and to help countries that may not have their own Earth-observing satellites to help assess damage and assist with evacuations."

ISERV will be installed in the Window Observational Research Facility (WORF) in the station's Destiny laboratory.

The Celestron CPC 925, is a 9.25″ diffraction limited Schmidt-Cassegrain telescope and off-the-shelf sells for $2,500 including the mount, (just the 9.25 inch optical tube sells for $1,479). It was modified at the Marshall Space Flight Center.

Canadian astronaut Chris Hadfield with the new ISERV (International Space Station SERVIR Environmental Research and Visualization System), a modified Celestron telescope for Earth observation.

"They used the fork mount that comes with it," Tabor said, "but they just removed the tripod and replaced it with a specialized mount to anchor and stabilize it on the ISS."

Because it is pointed out of a window and because the ISS is moving so fast, it would be difficult to align it with the sky and do any celestial imaging, Tabor said.

ISERV is the first of what is hoped to be a series of space station Earth-observing instruments, each to feature progressively more capable sensors to help scientists gain operational experience and expertise, as well as help design better systems in the future. Scientists envision that future sensors could be mounted on the exterior of the station for a clearer, wider view of Earth.

It arrived on the ISS in July of 2012 on board the Japanese HTV-3.

"It's been up there sitting in a box, so today was unboxing and assembly day," Tabor said. She added that they hope to post some of the first images from the telescope on their Twitter and Facebook pages.

The telescope will normally be operated by remote-controlled from Earth and so the astronauts won't likely be working with it directly except for assessing its operation or troubleshooting any problems.

"Images captured from ISERV on the ISS could provide valuable information back here on Earth," said Dan Irwin, SERVIR program director at Marshall. "We hope it will provide new data and information from space related to natural disasters, environmental crises and the increased effects of climate variability on human populations."

Image via @Cmdr_Hadfield on Twitter

How to Make a Sandwich in Space

If you miss the talk by Commander Hadfield on Sep 28, the answer to the question "How to make a (peanut-butter-and-honey) sandwich in space" is presented in the Youtube video link below. The secret is to NOT use bread, NOT use a knife and to lick all your fingers after you are done. Follow Hadfield's recipe on Earth and its a mess, but in space, it works.

http://www.youtube.com/watch?v=AZx0RIV0wss

Left: That's NOT a grimace at the taste of his sandwich, but a smile, actually. Zero-g turns a smile upside down...

Right: Peanut butter and honey on a tortilla will never replace a real PB and banana (or better yet Nutella) sandwich, but banana slices need to be mashed down to keep them in place. (Yes, they have fresh bananas on ISS).

Four craters line up for photo

In an example of "great minds thinking alike", I was out observing the very same crater (Petavius) on the very same night that Doug C. observed it. (See his column pg 7. in the August, 2013 SGN). In my case, I was testing out a new BAS telescope acquisition and the dates just happened to coincide. And there was that nice gibbous moon out there just calling...

The scope (described below) was equipped with a 2-inch adapter and so it was easy to attach my DSLR and take a few shots of the moon. The image at right shows one of the results.

The four craters lined up along the terminator not only show some nice terminator features (sunlit peaks, dark crater floors, etc.) but also provide a nice cross-section of typical lunar impact features found on the moon. And if we include Mare Crisium (the large mare bisected by the terminator at about the 2 o'clock position) we have examples of 5 impact structures that are well worth looking at for the sake of comparison alone.

The crater with prominently lit wall at 3 o'clock is Langrenus, a typical crater with central mountain peak. Next comes Vendalinus, a depression that appears to be <u>below</u> the surrounding mare level. Then Petavius, another large crater with central peak, but with a rille cutting it. Finally Furnerius, with its bowl-shaped interior.

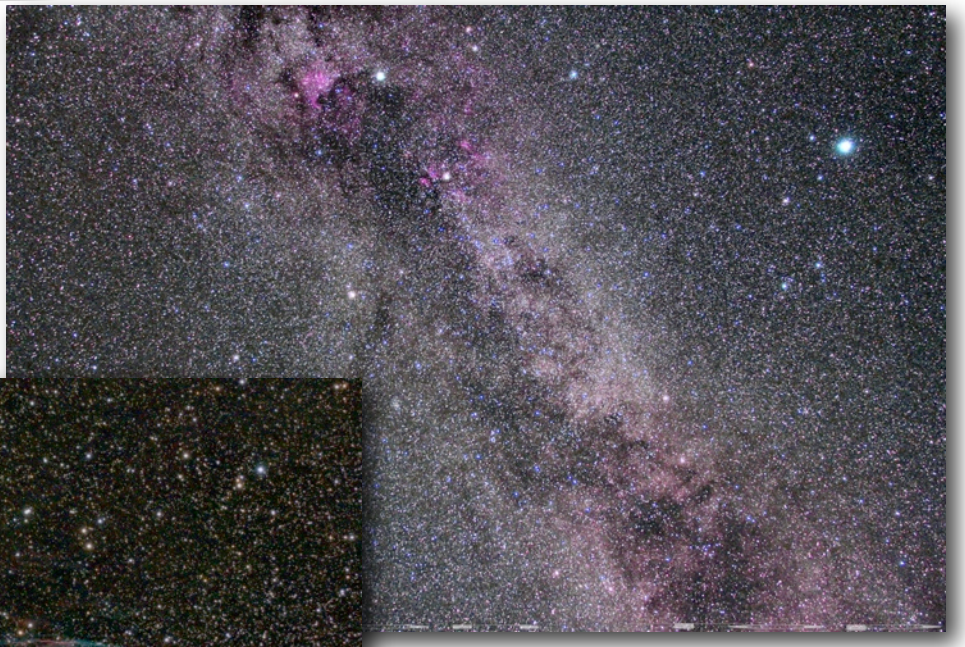
Canon 60Da, 1/8 s, ISO100, fl=1000 mm, an f/10 system

Here are some facts about these that you might find interesting. (Info from Rukl Moon Atlas).
***Langrenus** is 132 km across, has a beautiful set of terraced walls and a central peak and is about 2.7 km deep. It was one of the prominent craters photographed and described by Apollo 8 astronauts.*
***Vendalinus** is classified as a walled plain of 147 km diameter and appears to be much older than the others judging by the very subdued rim all around it.*
***Petavius** is another typical large lunar crater. At 177 km diameter, the largest crater of the four, there is a nice rille appearing to originate at the central mountain which extends to the SW crater wall. Look for a fainter cleft extending northwards from the peak as well as terraced walls in the rime of the crater.*
***Furnerius**, 125 km diameter, is more subdued and probably the oldest of the four with no central peak and a rather smooth bowl-shaped floor. A sharp-edged newer 20 km crater, Furnerius B is located inside.*
As Doug mentioned, this part of the Moon is best observed just a few days after full moon when the Moon is high in the sky and the air steadier for viewing. It is also visible at first crescent but the viewing time is shortened because the Moon is setting.

Vintage 4-inch SCT *Another coincidence is attached to the telescope used to record the Moon image at right. At Starfest in 1975, I heard (from Doug C.?) that a C-8 was for sale from a fellow in Priceville, To make a long story short, I went down and purchased it. It became my main telescope for viewing, chasing grazes and solar and lunar photography. In late July this year, the same gentleman called me and offered me the telescope which he bought to replace the C-8. At first, when I heard him say 4-inch Meade, I was not impressed because Meade had put its name on a 4-inch reflector that was built by Tasco, but when he said he would deliver it, I couldn't think of a reason to refuse. I probably would have turned him down if he had wanted me to drive to Priceville for pickup. Anyway, the 4-inch Meade turned out to be a Schmidt-Cassegrain, the first telescope of this size that Meade made and which followed the whole line of 8 and 10-inch SCT's that Meade put out to compete with the venerable Celestron C-8. The Meade-4 is, in fact, a very nice little scope and there were more surprises in the box. Read all about it (and its older brothers in our collection) in the October issue.*

BAS "photogs" have been busy

The summer sky is more accessible to astrophotographers in our area since winter objects, (the Orion Nebula for example) are high only during the coldest part of our year. The Milky Way, high in our summer sky, with its dozens of Messier objects, makes summer sky targets very accessible and attractive. Here are some results from two of the BAS "photogs" who have been busy recording features in the summer sky.



Aaron Top captured the image above using a tracking mount with camera piggyback. Cygnus Lyra MW: Canon 60Da, 240 s, ISO 4000, 25 mm focal length, f/4.0 on telescope mount. Taken at Gordon's Park, Manitoulin Is.

Veil Nebula part 1 (above): Frank Williams used his DSLR cooler box (a canabilized Koolatron) to keep camera sensor to -20C to capture this beautifully coloured image of part of the Veil Nebula. (NGC 6960). Frank uses a modest Televue 85, which is very capable of taking deep sky images especially on long exposures like this 1.5 hour shot. Camera used was a Canon T2i.

Above is Frank Williams' image of M22 -the other "great globular" in the northern sky, often overlooked. Frank writes: *"How come the clearest nights have so much moon? Oh well, globs show through. Though not as eye popping as in the Webster 28" , here's 5 min of M22 (10 x 30 sec subs) with my C11 and T2i I took last night. (very slightly cropped just to rotate and frame it a little more centered)."* [I would have mistaken this globular for M13, the Hercules Cluster, if I had not known otherwise. -ed]

Another Aaron Top image of an object in the northern Milky Way, the Double Cluster. A nearby bonus is the Heart and Soul Nebula IC 1805 and IC 1848, respectively. Both are barely visible in telescopes of 12-inch aperture or larger. Canon 60Da, 203 s, ISO 4000, 70 mm focal length, f/4.5 camera on tripod. Image taken at the Gordon's Park Dark Sky Preserve on Manitoulin Is.

Perseids put on a Spectacular Show

The 2013 version of the annual Perseid meteor shower demonstrated what a good shower this can be when the conditions are right. Both Aug 10 and Aug 11 were clear until dawn. On the down side, Aug 12 evening was clear only until it got dark and then it clouded over and rained. The peak was at 2 pm on Aug 12 during daylight so we were able to view the rise to peak but not the return to normal levels. Official peak number was 107 per hour.

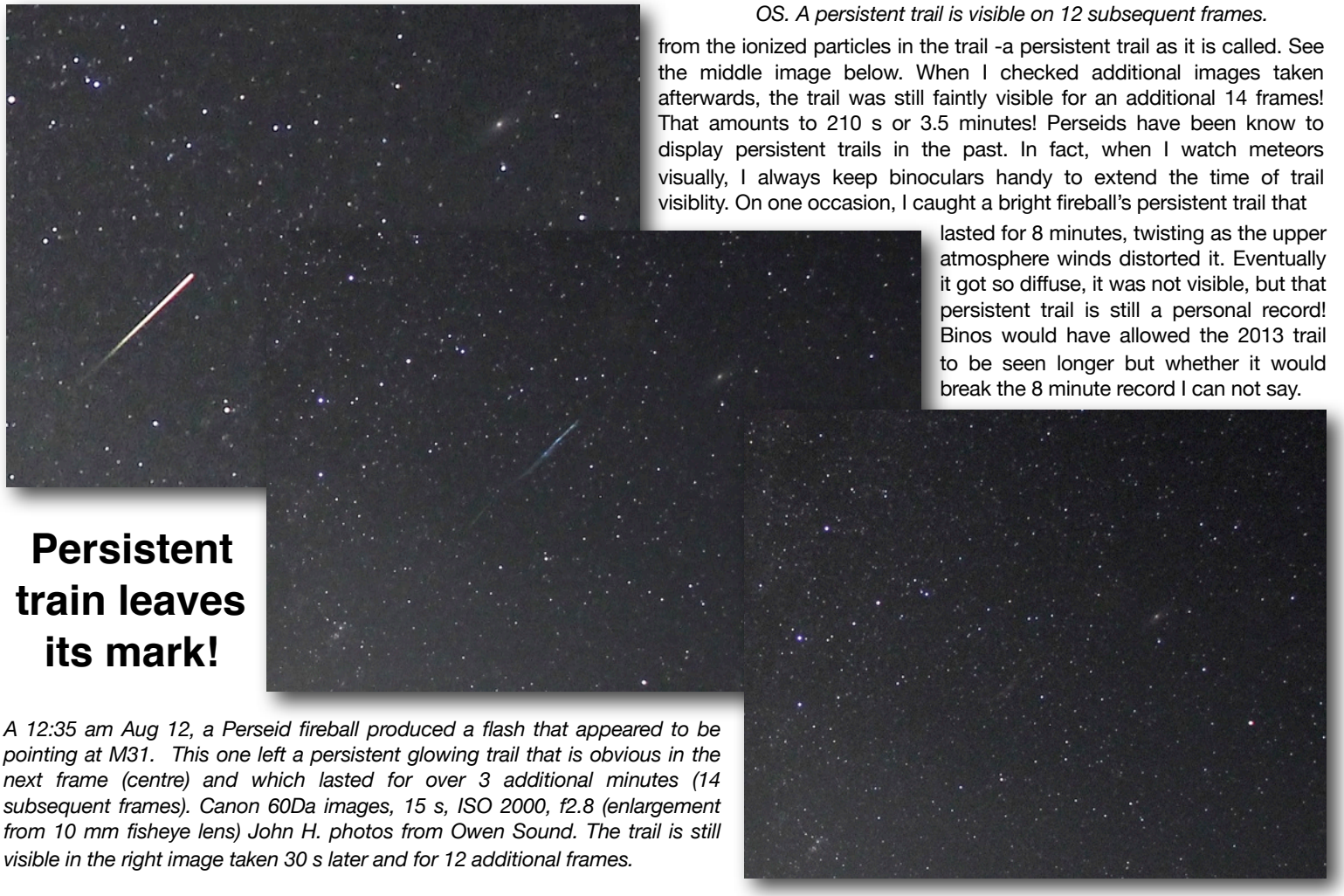
In the past, groups of observers have gotten together to do meteor counts from a dark location, but with the advent of digital cameras and electronic timers, it is possible to get a normal night's sleep while the camera records meteors. Granted this is not as exciting as seeing the brilliant fireballs with the naked eye, but personally, I have found myself falling asleep on past meteor vigils anyway, and only being woken at the shouts of other wide-awake observers when a bright fireball went by.

So for most of the recent meteor showers, I have set up my camera and let the timer do the work of taking images. I must say that this time around, the photo record did not disappoint. At 3:20 am on Aug 11, a bright fireball (mag -3?) created a beautiful trail about 20 degrees long just past the head of Aquarius. (Image right).

A 3:20 am Aug 11 Perseid fireball estimated at magnitude -3 or -4 created this 20° long trail just to the east of the head of Aquarius and below the Circlet of Pisces. Note the greenish start to the trail. Most of the trails showed this characteristic colour at the start. Canon 60Da image, 15 s, ISO 2000, f2.8 (enlargement from 10 mm fisheye lens) John H. photo from OS. A persistent trail is visible on 12 subsequent frames.

On the second night, the automatic camera recorded 34 meteor trails, 30 of which were Perseids. The other 4 did not point back to the head of Perseus, so these were "sporadics". Only one Perseid was better than the 20° fireball of the previous night.

That one was recorded initially on one frame at 12:35 am. However the camera shutter closed before the trail was finished! Then 2 seconds later the shutter opened for another 15 s image, this time catching the glowing gases from the ionized particles in the trail -a persistent trail as it is called. See the middle image below. When I checked additional images taken afterwards, the trail was still faintly visible for an additional 14 frames! That amounts to 210 s or 3.5 minutes! Perseids have been know to display persistent trails in the past. In fact, when I watch meteors visually, I always keep binoculars handy to extend the time of trail visiblity. On one occasion, I caught a bright fireball's persistent trail that lasted for 8 minutes, twisting as the upper atmosphere winds distorted it. Eventually it got so diffuse, it was not visible, but that persistent trail is still a personal record! Binos would have allowed the 2013 trail to be seen longer but whether it would break the 8 minute record I can not say.



Persistent train leaves its mark!

A 12:35 am Aug 12, a Perseid fireball produced a flash that appeared to be pointing at M31. This one left a persistent glowing trail that is obvious in the next frame (centre) and which lasted for over 3 additional minutes (14 subsequent frames). Canon 60Da images, 15 s, ISO 2000, f2.8 (enlargement from 10 mm fisheye lens) John H. photos from Owen Sound. The trail is still visible in the right image taken 30 s later and for 12 additional frames.

Sharing a Love of the Night Sky

"I have fallen in love with the stars" -Young astronomy enthusiast experiencing the Chi-Cheemaun Night Sky Tour

The Bruce Peninsula has the darkest night skies in South Western Ontario and it joins Manitoulin Island, Algonquin Park, and Haliburton, as having the darkest, most transparent night skies in Southern Ontario. The beautiful Bruce Peninsula is surrounded on three sides by Lake Huron and Georgian Bay and this watery barrier, combined with a noticeable lack of urbanization, and a low population density, guarantees pristine night skies. Indeed, in the last few years, two National Dark Sky Preserves have been established on the Bruce Peninsula; one is the Bluewater Outdoor Education Centre, near Oliphant, and the other is the Bruce Peninsula National Park/Fathom Five National Park near Tobermory. These two "dark sky preserves" effectively bracket the Bruce Peninsula's land mass with two islands of darkness! I certainly like that!

For the past two summers members of the Bruce Peninsula Biosphere Association's Dark Sky Committee have shared, and interpreted, these dark skies with hundreds of summer tourists and local residents. Indeed, last year over 1,800 people attended these Sky Tours and this year attendance will exceed 2,000. For the Lion's Head venue an open air planetarium, called the "POD", has been built at the entrance to our harbor. We received many compliments on such a beautiful location and setting for an evening of stargazing! My wife, Paula, came up with the name, which is short for Peninsula Observing Deck.

The real stars of our Public Outreach Program are the 12 volunteers who have given freely and tirelessly of their time and expertise. Amanda Stanger, Rod Steinacher, Doug and Paula Cunningham, Lee and Christine Brown, Brian and Wendy Reis, Jim Kuellmer, Mike Warkentin, Bill Hansen, and Elizabeth Thorne are to be heartily thanked! Actually, Amanda was our only employee, and she is a York University grad student who is currently completing her Master of Environmental Science. During June, my wife, Paula, and I provided a 3 night mentoring session at our Quetican Observatory for those 12 volunteers.

Each week the stargazing program was offered Friday and Saturday nights at the Lion's Head POD, on Monday night at Miller's Family Camp, on Wednesday night at Summer House Camp, and on Thursday night at the National Park's Singing Sands location. At right are two photos; one showing the crowd at one evening's talk at the Lion's Head POD, and another showing 8 of our 12 volunteers at the POD. The evening would start at twilight, with everyone gathering around the POD for a brief astronomy talk. Over the summer many astronomy themes were addressed ... Preserving Dark Skies, Constellations vs Asterisms, Planets vs Stars, Constellation Stories, Using a Telescope, the Solar System, Saturn's Rings, the Moon's Structure and Origin, Double Stars, Globular and Galactic Clusters, and the structure of the Milky Way. During the night as many as 7 telescopes were set up and numerous celestial objects were showcased to the great delight of our guests. Usually the program would end around 11:30 PM but on some nights, with large crowds, it would continue until 12:15 AM.

This year we introduced a fascinating new program. One of our Committee members, Rod Steinacher, decided to approach the Owen Sound Transportation Company to inquire if they might be supportive of a pilot project to bring a stargazing program to the Chi-Cheemaun, their Tobermory-South Baymouth ferry. This pilot program would be delivered on the final sailing of the day from South Baymouth to Tobermory for 11 consecutive nights, running from August 2nd to August 12th. Rod spent over 100 hours developing and delivering what became a very successful program. When the weather cooperated, as it did for 8 of the 11 nights, the program was offered to an average of 28 guests on the stern sun deck. During the 3 nights when the weather was not suitable Rod would give an astronomy lecture in the stern lounge. Rod employed 3 pieces of modern technology that greatly enhanced the program. Firstly, his laser pointer directed the public's attention to specific areas of the sky; secondly, his iPad had Astronomy Apps that showed the constellations wherever it was pointed; and thirdly, the Canon Image-Stabilized binoculars simply smoothed out the rocking motion of the boat and showed various astronomical objects to great advantage. The Owen Sound Transportation Company had purchased 6 pairs of these binoculars to facilitate the program. Rod's program was tightly scripted and timed to be delivered within an hour's time frame. After all, the program had to finish when the announcement was made for the patrons to return to their cars for disembarking.

After the Captain turned off the sun deck's flood lights, Rod's program began with a visual tour of the night sky. He pointed out various constellations and asterisms, showed how to find the North Star, noted Alcor and Mizar as a test of visual acuity, pointed out the glorious Milky Way, and located the Andromeda Galaxy using the Cassiopeia pointers.

The guests were particularly impressed with the views of the Milky Way from such a dark location. One gentleman in particular had wondered initially about the streak of light he saw in the sky when he came on deck and he was amazed to learn it was our home galaxy, the Milky Way. The image stabilized binoculars were a real bonus and were used to show people the Double Cluster in Perseus, the Coat Hanger Cluster in Vulpecula, the M11 Galactic Starfield, certain widely spaced double stars, and the planet Saturn. Rod treated the night sky with the reverence and awe that it deserves and, over 11 days in August, late night riders on the Chi-Cheemaun were treated to something very special ! The Universe and Rod touched their souls.

POD at Lion's Head Harbour

Bayside Astronomy Program volunteers

Left: Guests on the Chi-Cheemaun enjoy image-stabilized views of Milky Way objects.

36" scope at Starfest

BAS had the honour of holding the title "Largest Scope at Starfest" for only one year. Normand Fullam arrived with a 36-inch dobsonian to beat us out for 2013. Normand's story (a saga really) of it's construction had the audience alternately cheering and groaning as the events (including breakage of the first **two** 36-inch mirrors) unfolded. The third mirror was successful (and intact) and we were privileged to take part in first light on Saturday night. An optical expert who shall go nameless, pronounced it as showing slight astigmatism (but who cares when you are totally immersed in millions of stars in the Hercules Cluster!)

BAS crew at Starfest

2013 BAS Starfest contingent pose with the 2nd largest telescope at Starfest this year. L-R is Brett Tatton, Eric Ingard, Harry and Marty Barth, Rob Atkinson, Anton VanDyck, John Hlynialuk, Frank Paquette, Greg and Lorraine Rodgers. Absent: Cheryl Dawson, Doug and Paula Cunningham, Frank Williams, Doug and Sue MacLachlin.

Chelyabinsk Fireball Update

Peter Brown, in his 50 min. presentation provided the scientific results now available (mostly done by members of the UWO Meteor Physics Group). The dimensions of the object, the energy released, the extent of the damage is now well documented. A lot of information was gleaned from the hundreds of Russian dash cameras that recorded the event.

Brown's team studied in detail, 452 of the thousands of videos available, teasing out data about the height of the airburst, trajectory, and the geometry of the sonic shock wave and its path of ground damage. Interestingly, Brown indicated the shock wave was not spherical but a more cylindrical one and the path of the blast wave on the ground showed this clearly.

The energy of the blast has been pretty much defined from different measurements to be in the range of 500 kT. This is about 10 times the size of the largest nuclear device tested on Earth and about 33 times the Hiroshima blast. For comparison, the Tunguska event of 1908 was rated at 10 to 15 Megatons, or about 20 to 30 times as large. Fortunately for the residents of the city of Chelyabinsk, the blast energy was released at an altitude of about 30 km and only the shock wave did any damage. That broke thousands of windows, many unfortunately had people standing in front of them watching the developing smoke cloud. Luckily, no one was killed.

The trajectory of the mini-asteroid was quite shallow (16°) -a steeper path would have penetrated farther and probably done more damage.

The brightness of the fireball was exceptional. Visual estimates put it at "brighter than the sun" which is magnitude -26.8. The Chelyabinsk fireball was measured using various techniques from the video images at about -30 or about 20 times the brightness of the sun!

Some of the energy was dissipated in the form of infra-sound, an area of research at UWO in connection to their meteor studies. The energy spread out in a circle from the impact point and travelled rather slowly through the atmosphere taking many hours to complete one circuit of the globe. Brown's calculations indicated the infrasound energy was detectable for 3 days and travelled thrice around the globe, 90 000 km in all.

As for meteorites from the event, more and more are being found with the largest piece about 4 kg. This is miniscule in comparison to the total mass but much was pulverized in the explosion. Some large fragments are visible in the videos at the end of the trajectory but none of these have been found. The large crater in the ice of Lake Chebarkul was likely caused by a large piece (several 100 kg) that remained intact. Observers reported a white spurt of ice and cloud above the location of the crater and undoubtedly this was an effect of the actual impact. Divers did do a preliminary search but the silty bottom was difficult to search and nothing has been found to date.

After Brown's talk, I introduced myself and mentioned how happy we were to host a UWO Meteor Network camera. I also asked about whether UWO had obtained a Chelyabinsk fireball meteorite sample. Brown surprised me by saying yes they had one, but in the rush to get to Starfest, it was forgotten at the university. Dang!

Opportunity Still At Work on Mars *by* Ken Kremer, Aug 6, 2013 UNIVERSE TODAY

Opportunity Mountain Goal Dead Ahead as Mars Orbiter Restarts Critical Targeting Hunt for Habitability Signs

Opportunity rover's 1st mountain climbing goal is dead ahead in this up close view of Solander Point at Endeavour Crater. Opportunity will ascend the mountain looking for clues indicative of a Martian habitable environment. This navcam panoramic mosaic was assembled from raw images taken on Sol 3385 (Aug 2, 2013). Credit: NASA/JPL/Cornell/Marco Di Lorenzo/Ken Kremer (kenkremer.com)

NASA's most powerful Mars orbiter (MRO) has been given the green light today (Aug. 5) to capture new high resolution spectral scans that are absolutely crucial for directing the long lived Opportunity rover's hunt for signatures of habitability atop the intriguing mountain she will soon ascend.

NASA engineers will aim the CRISM mineral mapping spectrometer aboard the Mars Reconnaissance Orbiter circling overhead to collect high resolution survey scans of Solander Point – Opportunity's 1st mountain climbing goal along the rim of huge Endeavour Crater.

NASA's decade old rover Opportunity is about to make 'landfall' at the base of Solander Point, the Martian mountain she will scale in search of the chemical ingredients that could sustain Martian microbes. So the new spectral data can't come back to Earth soon enough.

Currently, the science team lacks the same quality of high resolution CRISM data from Solander Point that they had at a prior stop at Cape York. And that data was crucial because it allowed the rover to be precisely targeted – and thereby discover a habitable zone, Arvidson told me.

"CRISM data is required to find the phyllosilicate smectite [clay minerals] signatures at Solander Point. With the current resolution it is not possible to tell if the phyllosilicate smectite [clay minerals] outcrops are present" says Ray Arvidson, chief scientific investigator.

The new CRISM spectral survey from Mars is essential to enable the science team to carefully study the alien, unexplored terrain in detail and locate the clay minerals and other water bearing minerals, even before the rover arrives.

Clay minerals form in neutral pH water conducive to life.

Opportunity would then be commanded to drive to preselected sites to conduct "ground truth" forays at Solander. That's just like was done at Cape York and the "Esperance" rock loaded with clay minerals that turned into one of the "Top 5 discoveries of the mission" according to Arvidson and Steve Squyres, Opportunity's Science Principal Investigator of Cornell.

The new approved CRISM measurements due to be captured today will give Opportunity the best chance to be targeted to the most promising mineral outcrops, and as quickly as possible.

"With the coordinated observations from CRISM and Opportunity we will go into Solander Point a lot smarter!"

"And we'll have a pretty good idea of what to look for and where," Arvidson said.

Today marks Opportunity's 3389th Sol or Martian day roving Mars. Merely 90 days were expected!

Having completed her investigation of the rocky crater plains, the rover continues to drive south. Any day now Opportunity will drive onto the Bench surrounding Solander and start a new phase of the mission.

Since she basically arrived at Solander with plenty of power and ahead of schedule prior to the onset of the 6th Martian winter, the robot has some spare time to investigate the foothills before ascending the north facing slopes.

"We will be examining the bench and then working our way counterclockwise to reach the steep slopes associated with the Noachian outcrops that are part of the Endeavour rim," Arvidson said.

Ken Kremer

Read more: http://www.universetoday.com/103788/opportunity-mountain-goal-dead-ahead-as-mars-orbiter-restarts-critical-targeting-hunt-for-habitability/#ixzz2bD6Hnfyf

Scorpius (Sco)

α-Scorpii - Antares
β–Scorpii - Graflias
δ–Scorpii - Dschubba
ε–Scorpii - Wei
θ–Scorpii - Sargas
κ–Scorpii - Girtab
λ–Scorpii - Shaula
ν–Scorpii - Jabbah
σ–Scorpii - Al Niyat
υ–Scorpii- Lesath
[Note: γ-Scorpii is now σ-Librae -

Scorpius is a very conspicuous zodiacal constellation with many bright stars lying just south of Ophiuchus. It is the most aptly named of all the constellations bearing considerable resemblance to a giant scorpion with it's stinger poised to strike. Antares, a giant red star, is the brightest star in Sco at magnitude 1.2, making it the 16th brightest star in the sky. It is a supergiant star; if it were in the sun's position, its diameter (6,400,000,000 km) would engulf the orbits of the asteroids between Mars and Jupiter. Its density is very low; on Earth, it would be considered a vacuum. There are many objects worth observing with binoculars in this constellation; M6 and M7 are open clusters visible to the naked eye and are striking when viewed with fieldglasses. The star ν-Scorpii is a fieldglass double; μ–Scorpii is a fine wide double visible to the naked eye.

DOUBLE STARS

	Mag.	Sep (s)	Location	Remarks
α	1.2-5.2	3	162726	Red-Green
β	2.8-5.0-9.7	1-14	160320	Yell-Grn; striking contrast
υ	4.3-6.5-7.0-8.0	1-41-2	160919	Quadruple; called the most beautiful in sky.
ξ	4.2-7.2	8	160111	White-Grey; multiple
ρ	2.8-8.5	20	181825	White-Grey; multiple

MESSIER OBJECTS (Sco)

	Mag	Location	Remarks
M 4	6.4	162226	Globular Cluster
M 6	5.3	173732	Open Cluster. Beautiful; vis. naked eye. [Butterfly Cluster]
M 7	--	175135	Open Cluster, Visible to naked eye; two 5th magnitude doubles also in this field. [Ptolemy's Cluster]
M 80	7.7	161423	Globular Cluster. Very beautiful.

Other Objects of Interest in Scorpius

H12 - Open Cluster - Location 165341
NGC6124- Open Cluster- Location 162240.
NGC6231 -Open Cluster - Many doubles and triples in this field. Location 165142.

Libra (Lib)

α-Librae - Zubenelgenubi
β-Librae - Zubenschamali
γ-Librae - Zubenhahkrabi
σ-Librae - Zubenalgubi [formerly γ- Scorpii]

Libra is a faint zodiacal constellation located between Scorpius and Virgo; its four stars form a distinct quadrilateral shape that will aid in its identification. β-Librae has an unusual blue hue, observe it in binoculars. [Wikipedia says: In earlier times, Libra was represented not by a balance, but as the claws of a scorpion. The reason is a confused translation of the words "zubana" in Arabic and "zibanitu" in Akkadian, which mean both 'weighing scale' and 'scorpion'. In ancient Mesopotamia, a weighing scale was often the arm and the pans without a stand, and was hung up by a string tied to the midpoint of the arm, resulting in a close resemblance to a scorpion hung up by the end of its tail with its arms stretched out. The double meaning of "zibanitu" resulted in the constellation being called Chelae Scorpionis (the scorpion's claws), and it originally formed part of the claws of Scorpius. The modern Libra is the youngest of the Zodiac signs and in Greek mythology, depicts the scales held by Astraea (identified as Virgo), the goddess of justice.]

DOUBLE STARS (Lib)

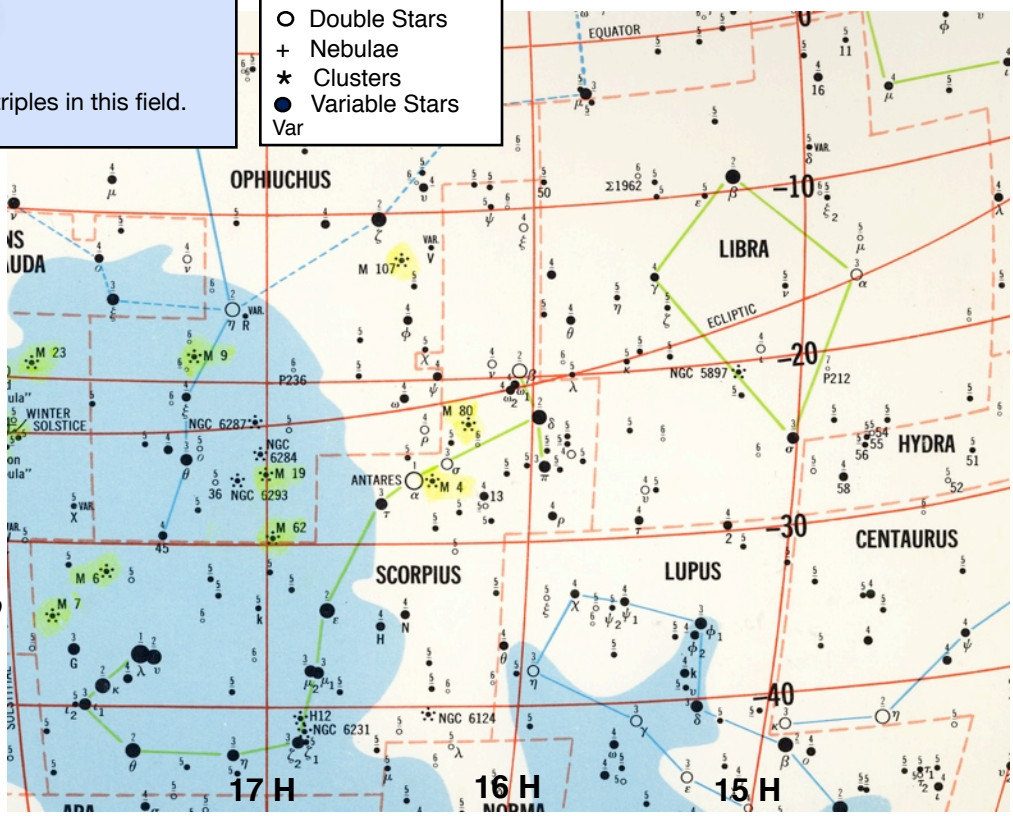
	Mag.	Sep (s)	Location	Remarks
α	2.8-5.2	231	144816	
ι	4.7-9.7	58	150920	Yellow-Purple
Σ1962	6.3-6.4	12	153609	Both White; very fine.
P212	7.0-8.0	20	145521	

Other Objects of Interest in Libra

δ–**Librae** -Eclipsing var. period 2d 8h, mag. range 4.8-5.9 Location 145808
NGC 5897 - Globular Cluster- Location 151421.

Dschubba or δ–Scorpii, in Aug of 2000 flared from its usual 2.32 to magnitude 1.9 and reached 1.6 or 1.7 in 2003. It has since varied from 1.6 to 2.1 but not gone back to its original 2.3 magnitude. Event is likely due to an eruption of gas from its surface which has created a disk. It still varies unpredictably.

JH image Canon 50D 33 mm fl, 3 min. exp. ISO 2000, Atacama, Chile



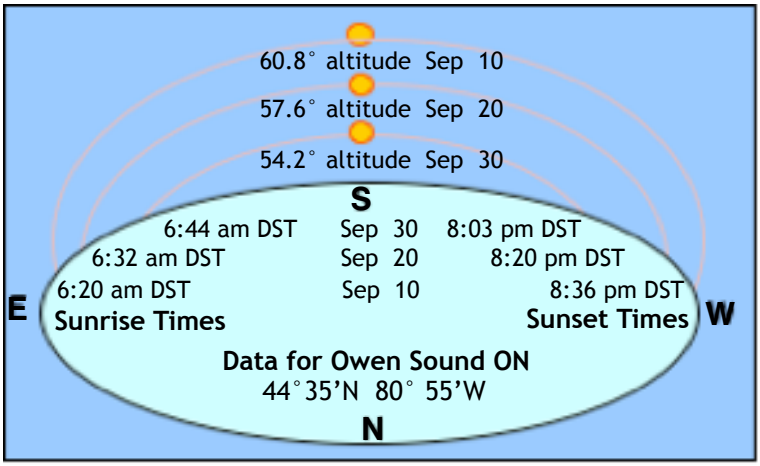
Sep 2 Mars 6° N of Moon
Sep 3 Zodiacal light visible before morning twilight in East for next two weeks
Sep 5 New Moon rises locally at 7:04 am DST
Venus 1.8° N of Spica
Sep 8 Spica 0.8° S of Moon (occultation in E. Canada)
Venus 0.4° N of Moon (occultation in S. hemisphere)
Mars in Beehive (M44)
Sep 9 Saturn 2° N of Moon
Sep 12 **First Quarter Moon rises at 2:41 pm DST**
Sep 15 Moon at perigee (367 391 km)
Sep 19 Venus 4° S of Saturn
Full Moon rises at 7:20 pm DST
Sep 22 Fall Equinox at 10:44 pm DST
Sep 24 Mercury 0.8° N of Spica
Sep 26 Last Quarter Moon rises at 11:58 am DST
Sep 27 Moon at apogee (404 308 km)
Sep 28 Jupiter 5° N of Moon

BAS Events

Sep 4 Wed **BAS meeting** ES Fox 7 pm Show and Tell and Starfest Recap -bring your stuff to show and stories to tell.
Sep 6 Fri (NM+1) **Public viewing** Grey Roots Museum 9 pm (Members with scopes appreciated)
Sep 7 Sat (NM+2) **BAS viewing @Fox** at dark, backup Sep 28
Sep 8 Sun (NM+3)**Crescent moon near Venus, Spica and Saturn** in West after sunset. Mars passes through Beehive Cluster in am.
Sep 14 Sat (FQ+2) **OSFN star tour/talk** (private tour) ES Fox 7:00 pm Leader: John H.
Sep 17 Tue (FM-2) **Close approach of Venus and Saturn** in the West after sunset. The two planets are 3.5° apart -nice in binos!
Sep 28 Sat (LQ+2) **Crescent Moon near Jupiter** today in the morning sky (sep = 5°). Look east before sunrise.
SPECIAL: Sep 28 Chris Hadfield speaks at OSCVI 7 pm.
Tickets $100 support Meaford Hospital from www.roxytheatre.ca

Planets

MERCURY, emerges in Sep as an Evening Star but is lower than Venus and even with mag.0.0, it is hard to locate in bright twilight. **VENUS,** (-3.9), is also a bright Evening Star low above the western horizon all month. It forms a lovely group with crescent Moon and Spica on Sep 8 and is near Saturn from Sep 16 to 20. **MARS** (1.6) is a dawn planet and increases its separation from Jupiter to 18°. **JUPITER**, (-2.0) is getting higher in the sky at dawn (50° by Sep 30). Jupiter, Mercury, Mars and the crescent Moon are grouped near each other Sep 3 and 4. The last crescent Moon is 7° away from Jupiter on Sep 3 and 5° on Sep 31. **SATURN,** (mag 0.7) is well past the meridian at sunset and low in the western sky setting before midnight. By Sep 31, it is setting by the end of twilight. Saturn viewing is pretty much done for the rest of the year. Both **URANUS,** (5.7) and **NEPTUNE,** (7.8) are above the horizon by 11 pm in Aug. They straddle the meridian by 1 am at the end of the month. Both **asteroids, Vesta (7.8)** and dwarf planet, **Ceres (8.1)** are now too close to the sun to observe. **PLUTO** (mag. 14) is in dark sky for much of the night and well-placed for viewing in Aug. The September BAS@Fox viewing night will target Pluto.
The diagram below gives the sunrise/sunset times and sun's altitude on three dates this month. The sun is at equinox on Sep 22. The Sep moon phase graphic below shows lunar phases for each night of the month. Times of moonrise for NM, FQ, FM and LQ are given in the Calendar listing at left.



Special Events | Venus and Mars Events

September is a good month for Venus and Saturn watching. Two events with Venus and Saturn occur as does a passage of Mars through the Beehive in the morning sky. On **Sep 8** the crescent Moon will be found near Venus, Spica and Saturn. The SN diagram below left shows the grouping. At the same time but in the **Sep 8 morning** sky, Mars is in the process of transiting the Beehive Cluster. Diagram below right shows the sequence. Later in the month on **Sep 17**, a close approach of Venus to Saturn occurs, again in the West after sunset. The two planets are under 3.5° apart and will be spectacular in binoculars or a low power wide field telescope.

Diagram above (©) Starry Night shows the crescent Moon, Venus, Spica and Saturn after sunset on Sep 8. Earlier that morning Mars just entered M44.

Diagram below © Starry Night shows Mars at 6 am on the mornings of Sep 6 to 10 S as it passes through the Beehive cluster M44.

Sept 2013

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

By permission
University of Texas
McDonald Observatory

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. 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.

One 12-inch Dob still available.

One 12-inch telescopes has been spoken for but the other is still available for the summer. We have two **8-inch dobsonians** for free member loan as well. Contact Brett T. or Aaron T. Scopes come in and out periodically so keep checking with Brett or Aaron if you are interested in a loaner.

SGN Classified Ads Section

(Now also on our website)

FOR SALE: Canon EOS 50D DSLR

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New Lower Price!

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

Asking $ 500. John H. 519 371-0670 **stargazer@wightman.ca**

Information about the 50D can be found here:
http://en.wikipedia.org/wiki/Canon_EOS_50D
and here: http://www.imaging-resource.com/PRODS/E50D/E50DA.HTM

FOR SALE: Meade LXD75 telescope mount

Meade LXD75 with the 497 AutoStar hand controller (GOTO system). It comes with two balance weights and 12 V power supply. This mount is a medium-duty mount that will support 30 pounds. Vixen-style dovetail mount suitable for up to 5 or 6-inch refractors or up to 9.25-inch SCT. ASKING $350.00

See http://www.cloudynights.com/documents/lxd75.pdf or http://www.cloudynights.com/item.php?item_id=2014 for more information.

Contact Brett Tatton (bretttatton@gmail.com)

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

Commander Chris Hadfield speaking in OS Sep 28

Canada's high-flying astronaut and social-media star is due to speak at the OSCVI auditorium on Sep 28 at 7 pm. Tickets are available at the Roxy box office and online at www.roxytheatre.ca Part of the admission price is eligible for a charitable receipt.

Judging by the title "How to make a sandwich in space", the talk will cover domestic issues on orbit, eating, sleeping, keeping clean, etc. He may or may not cover the niceties of grosser bodily functions, and if not, then someone in the audience always asks about using the space toilet. Hadfield has always handled that one with his usual charm and tact yet provided an accurate picture of toilet issues with typical Canadian aplomb.
This is a show not to be missed.

The last time Hadfield spoke at the OSCVI was in April of 2004. He is shown here with Matt Pickett, OSCVI principal at the time. Hadfield had completed 2 Shuttle missions , STS-74 and STS100. His ISS stay was yet to come.