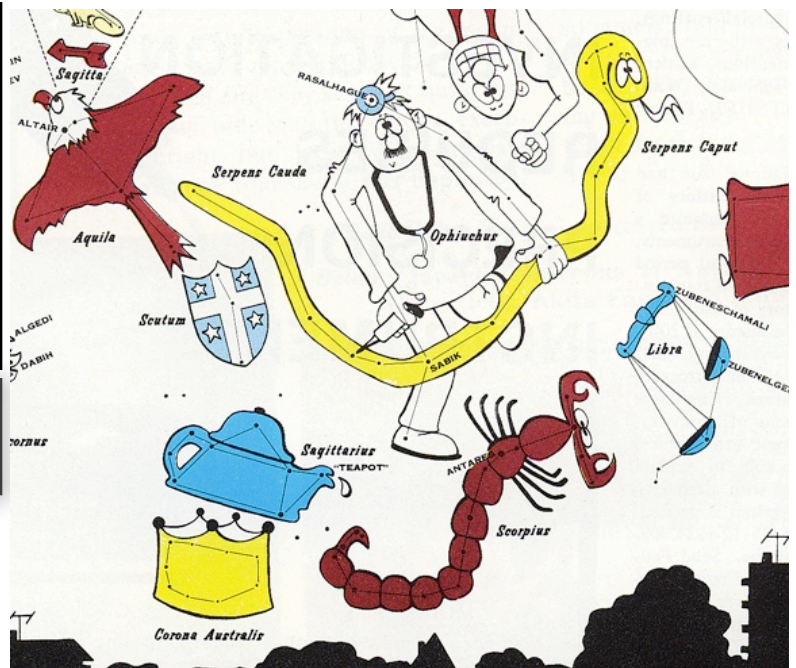




Astronomy News for Bluewater Stargazers
Vol 8 No. 8 August 2014

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Another George Reed constellation cartoon showing the featured constellation characters covered on pg 12 and 13 this month. It always amazes me how Mr. Reed can make all the characters look a bit cross-eyed, but still charming. Even the Scorpion is a bit wonky. Image used with kind permission from George Reed.

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Saturn sits nested in its rings of ice as Cassini once again plunges toward the graceful giant. This natural color mosaic was acquired by the Cassini spacecraft as it soared 39 degrees above the unilluminated side of the rings.

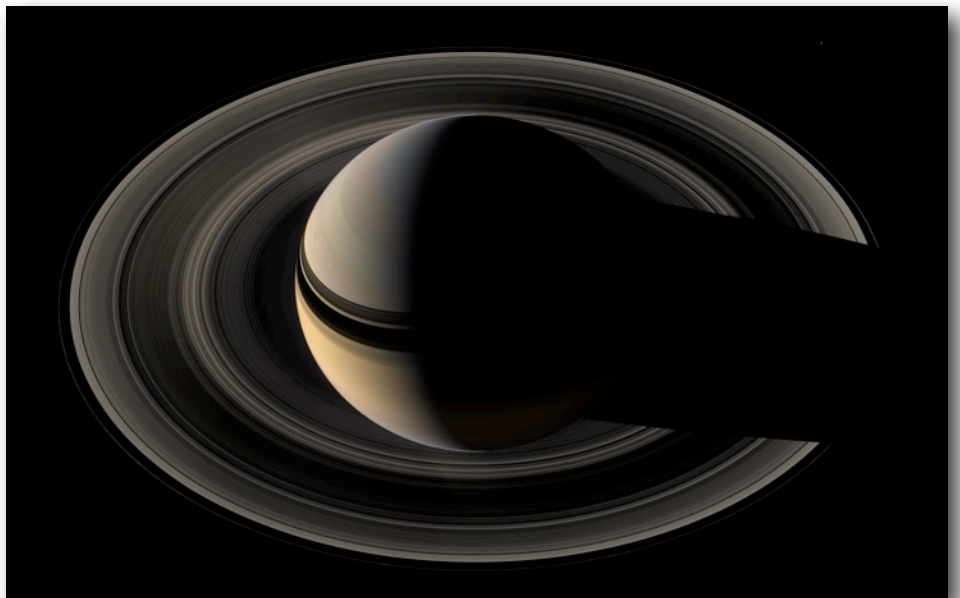
Little light makes its way through the rings to be scattered in Cassini's direction in this viewing geometry, making the rings appear somewhat dark compared to the reflective planet. The view can be contrasted with earlier mosaics designed to showcase the rings rather than the planet, which were therefore given longer exposure times.

Bright clouds play in the blue-gray skies of the north. The ring shadows continue to caress the planet as they slide farther south toward their momentary disappearance during equinox in 2009. The rings' reflected light illuminates the southern hemisphere on Saturn's night side. The scene is reminiscent of the parting glance of NASA's Voyager 1 as it said goodbye to Saturn in 1981. Cassini, however, will continue to orbit Saturn for many years to come.

Three of Saturn's moons are visible in this image: Mimas (397 kilometers across) at the 2 o'clock position, Janus (181 kilometers across) at the 4 o'clock position and Pandora (84 kilometers across) at the 8 o'clock position. Pandora is a faint speck just outside the narrow F-ring. This mosaic was constructed from wide-angle camera images taken just before the narrow-angle camera mosaic PIA08389.

The view combines 45 images -- 15 separate sets of red, green and blue images--taken over the course of about two hours, as Cassini scanned across the entire main ring system.

On the Saturn Frontier: Cassini's Bounty

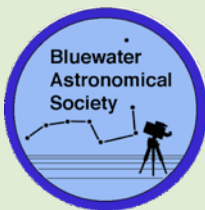


The images in this view were obtained on May 9, 2007, at a distance of approximately 1.1 million kilometers from Saturn. Image scale is about 62 kilometers per pixel.

For more information about the Cassini-Huygens mission visit <http://saturn.jpl.nasa.gov/home/index.cfm>. The Cassini imaging team homepage is at <http://ciclops.org>.
 Image Credit: NASA/JPL/Space Science Institute
[More Cassini Coverage on pg 9 and 10 -ed]

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

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



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BAS executive for 2013 to 2015 is:

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Vice-President:	John Hlynialuk
Secretary:	Lorraine Rodgers
Treasurer:	Cheryl Dawson
Past-President:	Brett Tatton
Past-Past President:	Dan Gieruszak
Membership Chair:	Dave Skelton

BAS Events in August

- Aug 2 (FQ) Moongaze at Inverhuron Pk.** Share the **Moon, Mars and Saturn** with campers after dark (9 pm). BAS members with scopes interested in helping contact John H. for details.
- Aug 6 Wed BAS meeting** at ES Fox Observatory 7 pm Topic: Movie Night. Bring a lawn chair. (Mike Tettenborn is on for Oct 1.)
- Aug 8 Fri (FM-2) Public viewing** Grey Roots Museum parking lot, 9 pm. Members with scopes appreciated. Contact stargazer@wightman.ca or lrodgers@bmts.com to confirm.
- Aug 12 Tue (FM+2) PERSEIDS viewing** at ES Fox Observatory after dark, gibbous Moon rises by 9:30 pm, 90/h. Come dressed for a cool evening and bring bug spray.
- New: Aug 16 (LQ) Stargaze at MacGregor Pk.** Share **Mars, Saturn, Milky Way** with campers after dark (9 pm). BAS members with scopes interested in helping contact John H. for details.
- Aug 21-24 Starfest 2014** More information at <http://www.nyaa.ca/index.php?page=/sf14/sf.home14>. The best annual star party in North America organized by the North York AA
- Aug 30 Sat (FQ-3) BAS viewing @Fox** -the regular NM viewing night at the Fox, viewing Saturn, Mars and objects in Milky Way.

August Astronomical Events

- Aug 10 Sun (FM) ☉** Night of the **Full Moon** "Grain Moon"
- Aug 12 Tue (FM+2)** **PERSEIDS meteors** (viewing at ES Fox after dark) gibbous Moon rises by 9:30 pm, 90/h
- Aug 26 Tue (NM) ☾**
- Aug 31 Sun (FQ-2) Occultation of Saturn** by Last Crescent Moon: -a daylight event 1:28 pm - 1:55 pm DST (a difficult but not impossible event to observe -Moon is only 6 degrees up in SE).



Webster Tales

Lots has been happening to the Webster lately. On July 18, she arrived at Whispering Pines for a night of stargazing with campers visiting for the weekend. Quite a few BAS members showed up to help show off the sights as well. Scopes ranging in size from a 4-inch refractor to a 12-inch Dobsonian (5 in all) were set up by their owners on the basketball court. Webster, naturally was the main attraction. One estimate of the visitors who came by, was upward to a hundred, about half of them kids. Saturn was the main attraction in all the scopes at first, and after it went below trees, other objects like the Alcor/Mizar pair, M13 and the Double-Double were viewed.

After the main crowd dispersed and a bit of serious observing began, viewers of the Dumbell Nebula (M27) reported seeing the central white dwarf (almost 14th mag) star. This remains to be confirmed. (Note that Pluto at 13.8 magnitude was seen in a 12-inch and the limiting magnitude for a 28-inch scope at 100X is magnitude 16 or 17). And M11, the Wild Duck Cluster did not look so much like a flock of ducks but more like a "Borg Cube" to at least two of the experienced viewers who checked it out. You had to be a 2nd Gen Star Trek fan to really appreciate it, of course.

Webster mirror has a new shine

The BIG NEWS is that since the Whispering Pines viewing, the Webster mirror has been re-aluminized! Brett T. made a quick trip to Normand Fullum's scope shop (Optique Fullum) near Montreal and got not just the Webster done, but two other mirrors as well along with their secondaries. The before and after images of Johh H.'s 12 inch are at right. The first light for the newly-coated 28-inch mirror was over the Dark Sky Weekend at the Bruce Peninsula National Park July 25/26. The first reports are good. Rain prevented stargazing on Saturday night.



Before
 <---
 and
 after
 --->
 (12-inch)
 f/6.0
 mirror



Ceres-Vesta “Appulse”

If you are into dwarf planet/asteroid watching, early July was a good opportunity to see the two brightest and first-discovered asteroids make a “hair-breadth” flyby. Asteroid magnitudes from *Starry Night* are given on both images.

The weather co-operated for a change -the nights of July 3, 4 and 5, the night of closest approach, were clear and even with the FQ Moon present, it was not so bright that it made locating the finder star impossible. Heze, also known as ζ-Virginis, a 3.3 magnitude star, was easy to pick out to help locate Ceres/Vesta which were 2° or so below it.

The term “appulse” is used to refer to the close approach of any two objects in the sky and is different than “conjunction”. See the box below for the Wikipedia definition of the terms. The listings of events in the *Sky Calendar* use times provided by various astronomical sources for the conjunctions of two objects and not usually the times of closest approach which is the appulse time. However, our esteemed editor likes to identify the latter since they are always more interesting. *Starry Night* is used by the fore-mentioned editor to determine the appulse times and these are what you will find in SGN’s Special Events section, for ex.

Sometimes however, our normally careful editor gets burned. The Ceres/Vesta celestial paths in *Starry Night Pro* (ver 6.2.3) turned out to be seriously in error. SN Pro Plus (6.4.3) has them corrected but not before a lot of confusion by our usually meticulous editor and even publication of the incorrect date for the closest approach. For publishing a date that was 5 days in error, he deserves a self-administered slap-on-the-wrist. Consider it done. Mea culpa.

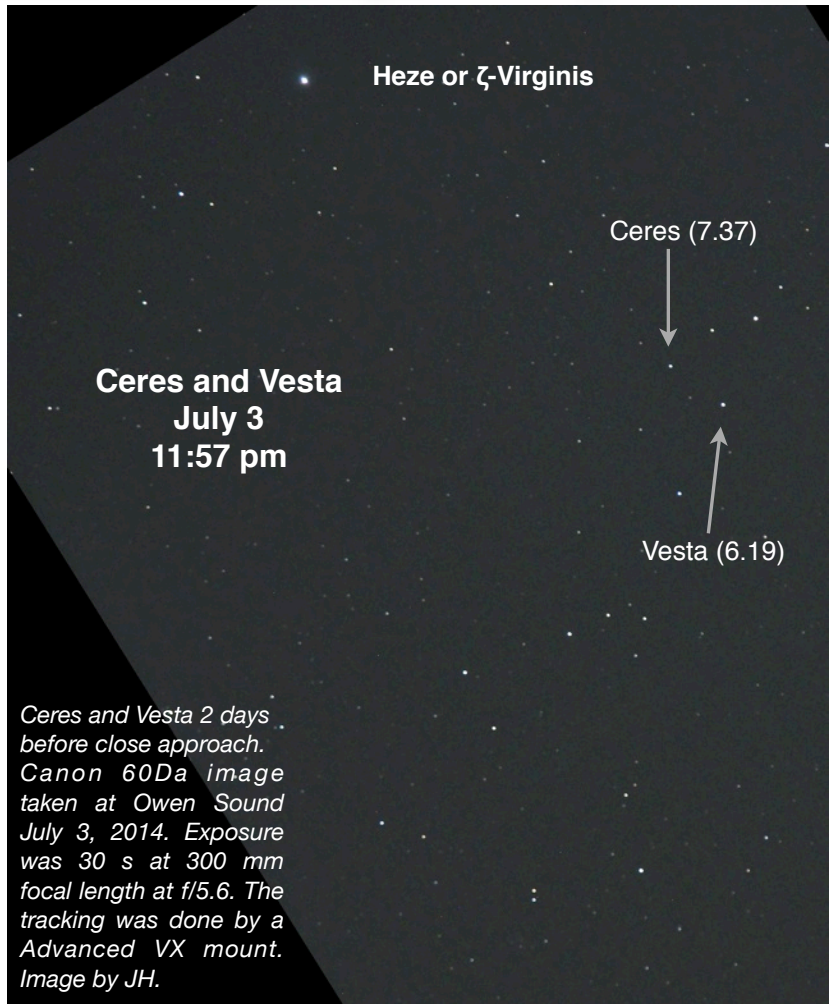
Appulse is an astronomical term that refers to the closest approach of one celestial object to another, as seen from a third body. Usually it refers to the close approach of two planets together in the sky, or of the Moon to a star or planet as the Moon follows its monthly orbit around Earth, as seen by an observer located on Earth.

An appulse is related to a conjunction but the definitions differ in detail. Whereas an appulse occurs when the separation between two bodies is at its minimum, a **conjunction** occurs at the instant when the two bodies have the same right ascension or the same ecliptic longitude. In general, the precise time of an appulse will be different from that of a conjunction. It is possible in some particular cases for an appulse to occur but no conjunction.

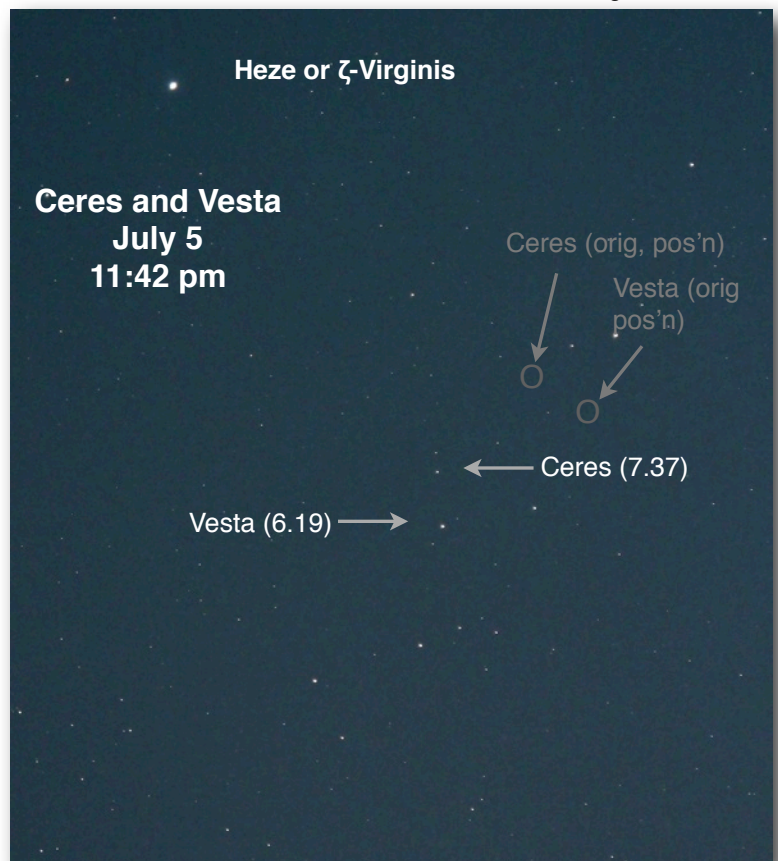
Where the celestial bodies come so close together that one actually passes over the other, the event is known as an **occultation**.

An appulse is an apparent phenomenon caused by perspective only: there is no close physical approach in space between the two objects involved and scientists insist that appulses have no direct effect on the Earth. They can be interesting naked-eye events for general observers when they involve bright planets and the Moon.

Right: Ceres and Vesta were “captured” in this image at a point close to minimum separation. Canon 60Da image taken at Inverhuron Prov. Park July 5, 2014. Exposure was 20 s at 285 mm focal length at f/5.6. The tracking was a tiny bit off since polar alignment was done in daylight. Image by JH.



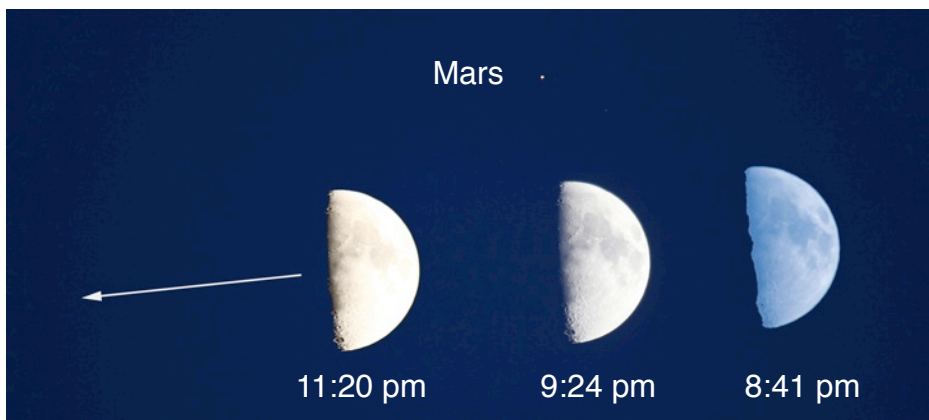
Both images are approximately the same scale and orientation. Note how far the asteroids have moved in two nights.



July 5 Inverhuron Stargazing Success

Campers spending the weekend at Inverhuron Provincial Park were treated to views of the planets Mars and Saturn and a FQ Moon. Image right recreates the sequence as the Moon slipped below Mars over the course of about 1.7 hours. Having a prominent object like Mars as a reference point made the motion much more obvious. Most times there is no easy reference point and background stars are mostly washed out by moonlight.

The event was scheduled for 9:30 pm and so we started with a talk about Moon phases and its motion in our sky. After introducing the BAS group who were there with telescopes (Frank P. Brett T. and John H.) we pointed the scopes at the Moon and showed off the terminator. Once it got darker, Saturn became the target. As soon as it was dark enough to see the major constellations, the laser show started. The best count of attendees tallied 110 people -about half of these were kids!



Two Moon images (left and right) were added to the centre 9:24 pm image with Photoshop to show how much the Moon moved in 1 h 39 min (positions approximate). The 8:41 pm image is blue because the sky was still bright with twilight and on that image Mars was just barely visible. Binoculars did show it a bit better at the time. By the time the sky was dark (9:30 pm or so) Mars was easily visible to the naked eye and several people spotted it and asked about the "star" above the Moon. Moon images by JH were 1/50 s, 1/125 s and 1/1000 s (L-R) at ISO 1000. Canon 60Da with 100-400 mm telephoto set at 400 mm and f/5.6. All were tripod images.

July 12 at MacGregor Provincial Park: Supermoon 1 of 3

The second of three Bruce Peninsula parks at which BAS members attempted star shows in July was MacGregor Provincial Park. A week after the successful event at Inverhuron (our first there) the clouds prevented a similar show at MacGregor just south of Port Elgin. This time the main feature was the misnamed "Supermoon" and clouds generally over all of Bruce and Grey prevented anyone from getting an image, although both the nights before and after it was clear enough.

Not one, not two, but THREE Supermoons this year:

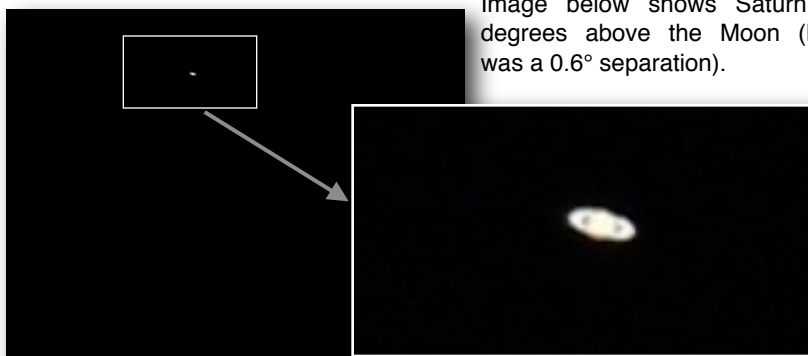
The next supermoon (more correctly called the perigean Full Moon) happens Aug 10 thus spoiling the annual Perseids. The time difference between FM and perigee July 12 was about 20 hours. The August 10 repeat is only 9 minutes! The difference is back to 21 hours or so Sep 9. So technically there is only one true "supermoon" Aug 10, but the media has latched onto some astrologer's supermoon designation and they are running amok wit it.



Above: Super-sized Full Moon (Jun 2013) vs Mini-sized Full Moon Dec 2013. The Mini-Moon got no press or even any respect. Images by John H

Saturn Over the Moon

The second of two planet passes occurred two days later and was very reminiscent of the Mars event. This time the Moon passed below Saturn by about 3 times the distance and even in binoculars one could tell that Saturn was not a round disk. Image below shows Saturn 1.3 degrees above the Moon (Mars was a 0.6° separation).



The inset shows an enlargement of the "dot" and it has a telltale ring appearance. There were two images used here, a short one (about 1/1300s) to not over-expose the moon and a 1/64s exposure to record the fainter Saturn. Both were taken from my backyard observatory in Owen Sound with a TVNP101 (4-inch) refractor at prime focus. Focal length was effectively 864 mm with the APC chip on the Canon 60Da camera. The shorter Moon image did not actually show Saturn very well so Saturn was "stretched" to get it to appear brighter than it was on that image. The inset is from the longer exposure where the Moon was overexposed. Images by JH on July 7 at 10:01 pm. Similar close passes of Mars and Saturn occur on Aug 3 and 4 but in the hours before sunrise this time.



Super-Massive Black Hole Trio

A trio of closely orbiting supermassive black holes has been spotted in a galaxy nearly 4.2 billion light-years away. The discovery was made by an international team of astronomers, which points out that such triple systems are very rare because most galaxies have just one black hole at their centre. This system is particularly interesting to astronomers because two of the three black holes are very closely bound, forming a "tight" binary pair within the system.

Astronomers know that supermassive black holes – the largest type of black hole, which can be billions of solar masses – lie at the heart of most galaxies, including our own Milky Way. Most galaxies are believed to evolve via collisions and mergers between smaller galaxies, so some of the larger galaxies should contain multiple supermassive black holes. Having two or more such gravitational powerhouses in a galaxy would have profound effects on its structure and dynamics. As a pair of supermassive black holes orbit one another, for example, the binary system's gravity would disrupt the gas and stars at the centre of the host galaxy. This, in turn, could lead to a burst of star formation or even the ejection of one of the black holes from the galaxy.

Heavyweight triplets

To date, only a few galaxies with two supermassive black holes have been found, and just four triple black-hole systems are currently known. The closest known spacing between black holes in a binary system is 2.4 kiloparsecs – about 1/10th the diameter of the main disc of the Milky Way. The new system, detected by [Roger Deane](#) of the University of Cape Town, South Africa, and colleagues, consists of two supermassive black holes separated by a mere 140 parsecs, while the third of the trio is 7 kiloparsecs from the close-knit pair. The two black holes in the pair are orbiting one another at high speed – more than 100,000 m s⁻¹.

The team made its discovery while studying six galaxies that were thought to host binary supermassive black-hole systems based on near-infrared and optical observations. The researchers found that one of the black holes was actually two, and hence that

particular system is a triple. Because the astronomers did not have to search through many candidates to find the system, they believe that tightly knit binaries and indeed triple systems of black holes could be more common than previously thought.

Giant radio telescope

The team employed a technique known as very long baseline interferometry (VLBI) to study the trio. VLBI creates a giant radio telescope spanning thousands of kilometres across the globe by combining the signals from large radio antennas that can be separated by up to 10,000 km. This allows astronomers to see detail 50 times finer than that possible with the Hubble Space Telescope. The current observations were done with the [European VLBI Network](#) (EVN) and the data were correlated at the [Joint Institute for VLBI in Europe](#) (JIVE) in the Netherlands.

Deane told *physicsworld.com* that the discovery demonstrates the power of VLBI to differentiate between multiple objects in systems that are huge distances from Earth. Before the latest discovery, a pair of supermassive black holes with the closest orbit (about 7 parsecs apart) was spotted in a galaxy some 750 million light-years from Earth. "Our system is 4.2 billion light-years away, which is much more distant than the closest known pair, demonstrating that the VLBI technique can be used to probe close black-hole pairs across a fair fraction of cosmic time," he says.

Spinning jets

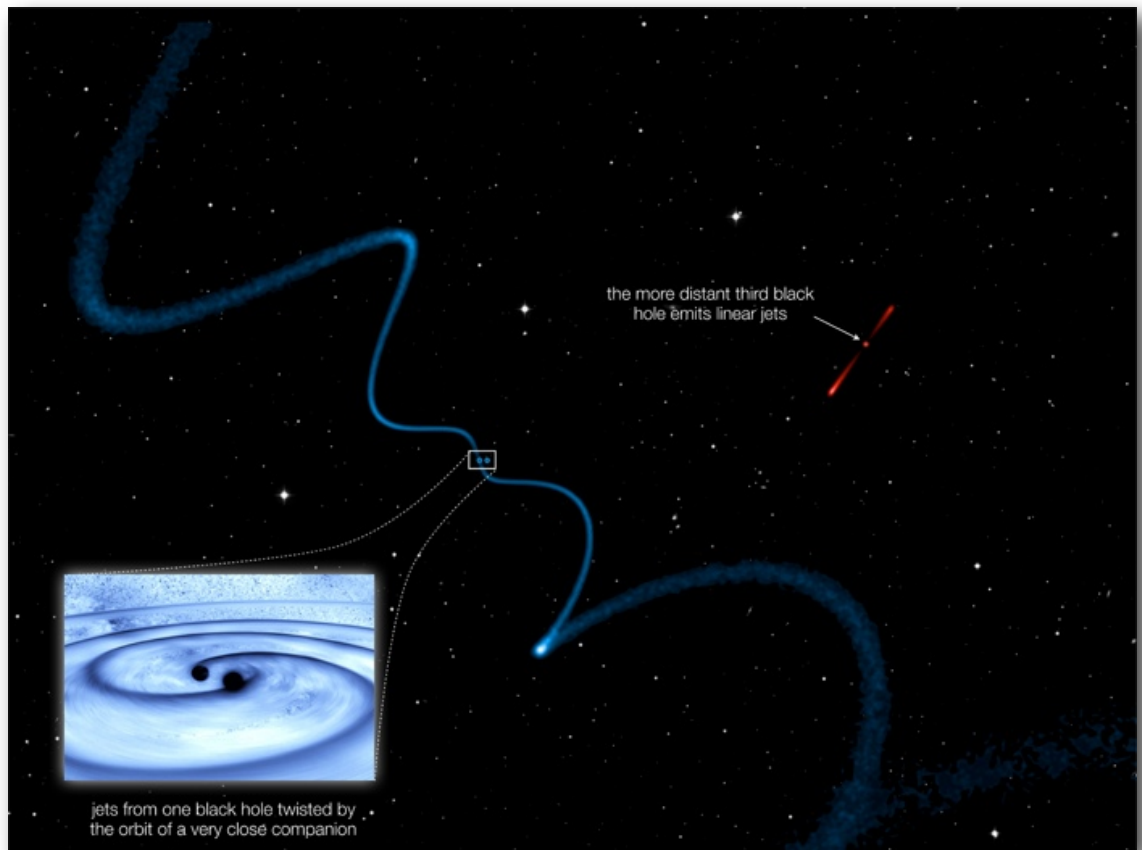
The presence of the bound pair was also revealed via a much more prominent feature – the large-scale radio jets emanating from the black holes. Such astrophysical jets are a common feature of supermassive black holes – accreted matter collecting around the event horizon of the black hole is ejected along its axis of rotation as it tries to fall into the hole. The triple system has three such jets, and Deane and colleagues found that the presence of the tight pair is imprinted onto the properties of the jets. Indeed, the orbital motion of the black holes in the pair twists the jets into a helical or corkscrew-like "S" shape. This provides astronomers with a "smoking gun" for a binary black-hole system that could be used in future searches.

Deane also points out that this extreme triple system could be creating gravitational waves – ripples in the very fabric of space-time. Future telescopes, such as the [Square Kilometre Array](#), should be able to detect these ripples for black holes that are even closer together. "It fills me with great excitement as this is just scratching the surface of a long list of discoveries that will be made possible with the Square Kilometre Array," Deane says.

The research is published in [Nature](#).

About the author

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“The Milky Way Rose Like a Storm Over the Namib Desert!”

“One of the best observing experiences of my life came unexpectedly in May, 1990 at the Texas Star Party. From 11 p.m. to 3 a.m. I simply sat in a chair and watched the Milky Way.” -Walter Scott Houston Deep Sky Wonders Column, Nov. 1990 Recounted by Stephen James O’Meara

Stephen James O’Meara, in his book on Walter Scott Houston, was discussing the fact that we, as amateur astronomers, have trouble seeing the forest for the trees! He was referring to the fact that we spend most of our time, squinting through an eyepiece, straining to glimpse the faint details of galaxies, or nebulae, that are just borderline visible through our telescopes. All the while, above our heads, the closest galaxy, our Milky way, is naked eye visible in glorious detail! [O’Meara recounts that] Houston had dozed off for a short time and, when he woke about 11:00 PM, his eyes were quite dark adapted. His views of the Milky Way that night became etched in his memory as the best observing experience of his life. He came away from that experience with a profound insight of the Milky Way as the “backbone of the sky”. It was quite an emotional encounter for him.

It was a similar emotional experience that my wife, Paula, and I had recently when, in late June 2014, we observed the Milky Way from the dark skies of the Namibian Desert. The idea for this Starfari trip came a year and a half ago in Port Douglas, Australia, over lunch, just after our solar eclipse expedition there had been clouded out. The conversation turned to our favourite trips and Paula noted that her best trip, because of the safari animals, was a solar eclipse trip (June 21st, 2001) to Zambia and Zimbabwe. Dennell Falk, owner of Civilized Adventures of Calgary, commented that, if you wanted to combine great night skies with African safari animals, then the place to go would be Namibia in their winter.

I was intrigued! Namibia is an desert country with a land area greater than France and Germany combined. It is located in southwestern Africa, and borders Angola and Zambia in the North and South Africa and Botswana in the East. With a population close to 3 million, it is sparsely populated, and very safe to explore. The people are very friendly and most of them speak English; in fact, the literacy rate in Namibia is the highest in Africa. I thought, “When Namibia has winter in June, their night skies will feature the Milky Way, with its glorious center, placed right overhead! Now, that would be a great observing experience.”

I had heard from astro-imager, Johannes Schedler, that the Namibian Desert rivals both the Australian Outback, and the Atacama Desert of Chile, as an observing Nirvana for stargazers. Our planning process began, and a year and a half later, on June 17th, 2014, Paula and I, along with 6 other Canadians, flew from Toronto to Cape Town, South Africa, and from there, to Windhoek, Namibia. The trip became a natural history adventure of a lifetime.

For the astronomy portion of our adventure we had arranged accommodation at the Namib Naukluft Lodge, which is located on a private game reserve adjacent

to both the huge Naukluft National Park and the world

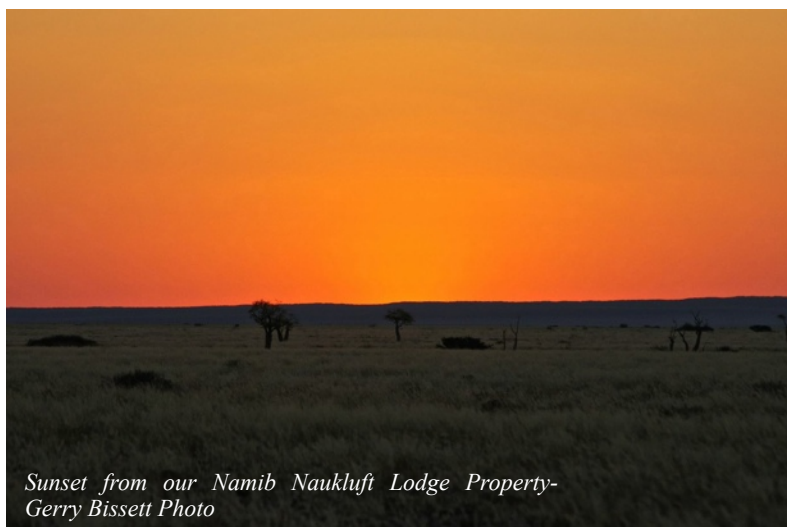
class Sossusvlei sand dunes. The sunsets in themselves were outstanding and usually promised exceptional observing conditions later in the night. Although our lodge had dark sky friendly lights, we still chose an observing site located some distance away and visually protected by huge hill of petrified sand dunes. Except for a distant light when a Safari vehicle was returning from a sunset drive there was not a light on the horizon! Really, these dark Namib desert skies



Location of Namibia

must be seen to be believed! Paula and I had previously observed the Milky Way from the Atacama Desert of Chile, the Outback Desert of Australia, the Karoo Desert of South Africa, the Sonoran Desert of Arizona, and the Gobi Desert of China. We were interested in seeing how the Namibian night skies compared to these other world class sites.

Our group had previously arranged with Robert Johnstone, executive director of SOLNA (Space Observation Learning Namibia), to provide three GoTo Meade telescopes for our use at this location. The telescopes were delivered in the early morning and when we arrived at our observing site they were all set up. Paula and I had brought our Canon Image-Stabilized binoculars and placed them, along with our detailed star maps of the southern constellations, on the empty chair beside our seats. As the



Sunset from our Namib Naukluft Lodge Property- Gerry Bissett Photo

sunset progressed, our friends, Gerry Bissett, Don Hladiuk, and

Claire Menzies, set up their tripods for Milky Way photography. As Paula and I watched the darkening sky, the planets Jupiter, Mars, and Saturn joined with Canopus, Sirius, Antares and Arcturus to penetrate the astronomical twilight. Even the zodiacal light made an appearance. The astronomical stage was now in place and the main actor, the Milky Way, became the prominent night sky feature.

In the northern hemisphere we only get to see part of our galaxy with its center poorly placed on the southern horizon. But, in Namibia, as the night progressed, the center of our Milky Way, in Sagittarius, climbed high overhead. No averted vision was required! Our galaxy's star clouds spilled over from Sagittarius into Scutum, Scorpius, Ophiuchus, and Centaurus. Amazingly, this was the first time I have really seen our home galaxy appear as it is .. an edge-on spiral with a distinctive galactic bulge! My photos of the central

and Carina constellations that we don't see from our northern home. A multitude of wonderful star clusters and gaseous nebulae were revealed... especially around the Eta Carina complex. Only the wide fields of view of our IS binoculars did this region justice. The coloured stars, dazzling galactic clusters, rifts of dark nebulae, and the gaseous emission and reflection nebulae were splendid binocular sights. Most of our observing involved naked eye and binocular astronomy. Houston expressed the same sentiment when he said after viewing the Milky Way from the Texas Star Party in 1990 " *I just observed the Milky Way with that marvelous and often ignored optical instrument, the human eye.*"

So, how does the Namibian desert compare with the Atacama Desert and the Australian Outback as a stargazing destination? Our Namibian observing experience was first rate- the trip of a lifetime- ;



*Milky Way Over the Namib Desert just after Sunset at Naukluft Lodge, Namibian Desert Photo by Don Hladiuk
Canon 6D, 12 mm Fish Eye 25 s, f/5.6, ISO 4000*

bulge of the edge-on spiral galaxy, NGC 4565 (called the Needle Galaxy), which is located in Coma Berenices and is about 43 million LY away, provides a more distant model of the closer Milky Way views that we were experiencing that night. The actual Milky Way detail visible this night was impressive. The Milky Way's luminous star clouds, which extended through Centaurus and Carina in the south, and Aquila and Cygnus in the north, acquired a 3-dimensional quality as they were framed by adjacent contrasting dark nebulae. These dark nebula have fanciful names, such as; the Prancing Horse, the Coal Sack, the Emu, and the Great Cygnus Rift and they were easily seen with direct vision. Don Hladiuk's 25 second Milky Way image captured the essence of what we were seeing.

Paula and I spent most of our observing time just soaking in the sights. The rented telescopes got little use. We used our binoculars to scan those southern portions of the Milky Way through Centaurus

but really, I think it's a toss up! When we observed from the Atacama desert the astronomy was quite good, but the night sky transparency was compromised by suspended dust from wind storms; and, as well, there was some light pollution from nearby San Pedro de Atacama. I think that, if we had observed from the Paranal region of the Atacama, we would have had an observing experience the equal of Namibia. When we attempted to observe from both Alice Springs and Uluru (Ayers Rock), both located in the Australian outback, freak rain storms ended each of our observing sessions, so, no comparison is possible. However, on another Australian visit, we observed from the Coonabarabran region, located near the Siding Spring National Observatory, and we had a marvelous observing session... the equal of Namibia. So, really, take your pick, Namibia, Chile, or Australia - each one is Nirvana for both amateur and professional astronomers.

Rosetta Sees Double Nucleus !

July 24, 2014: As the European Space Agency's Rosetta probe approaches Comet 67P/Churyumov-Gerasimenko (67P) for an August rendezvous, the comet's core is coming into sharper focus. Today, ESA released a new set of images and a striking 3D model of 67P's nucleus. The resolution of the latest images taken by the spacecraft's OSIRIS imaging system on July 20th is 330 feet (100 meters) per pixel. At that resolution, 67P appears to consist of two parts: a smaller head connected to a larger body. The connecting region, the neck, is proving to be especially intriguing.

"The only thing we know for sure at this point is that this neck region appears brighter compared to the head and body of the nucleus," says OSIRIS Principal Investigator Holger Sierks from the Max Planck Institute for Solar System Research in Germany. This collar-like appearance could be caused by differences in material or grain size, or could be a topographical effect--no one knows.

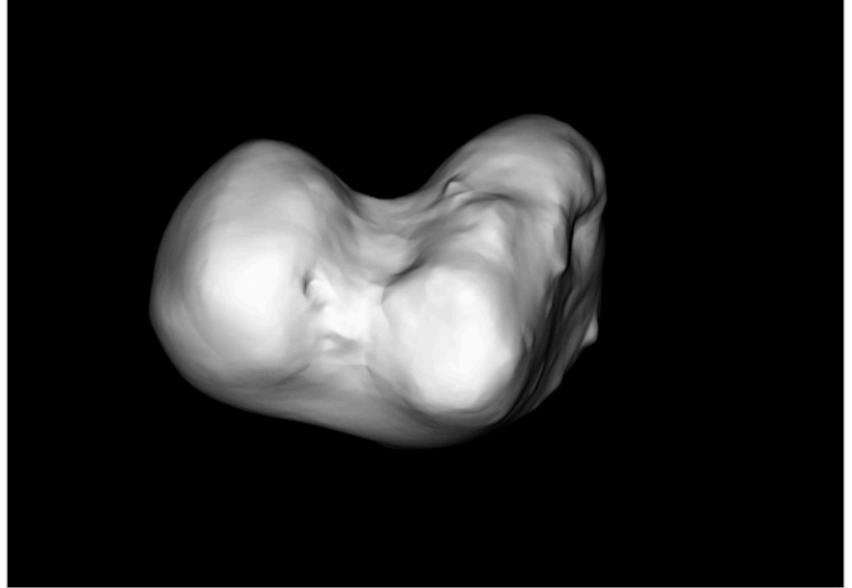
The appearance of 67P reminds mission scientists of comet 103P/Hartley, which was visited in a flyby by NASA's EPOXI mission in 2010. While Hartley's ends show a rather rough surface, its middle is much smoother. Scientists believe this waist to be a "gravitational low." Because it contains the body's center of mass, material kicked up by, say, meteoroid impacts, that cannot leave the comet's gravitational field is most likely to be re-deposited there. Whether this also holds true for 67P's neck region is still unclear. Another explanation for the high reflectivity could be a different surface composition. In coming weeks, the OSIRIS team hopes to analyze the spectral data of this region obtained with the help of the imaging system's filters. These can select several wavelength regions from the reflected light, allowing scientists to identify the fingerprints of certain materials and compositional features.

Rosetta will be the first mission in history to rendezvous with a comet, escort it as it orbits the sun, and deploy a lander to its surface. ESA says the next high-resolution OSIRIS image will be published on July 31st. Stay tuned!

See the MOVIE from NASA/ESA here:

<http://www.nasa.gov/jpl/rosetta/pia18419/#.U9JjxyhQfDV>

Rosetta's Philae lander is provided by a consortium led by the German Aerospace Center, Cologne; Max Planck Institute for Solar System Research, Göttingen; French National Space Agency, Paris;

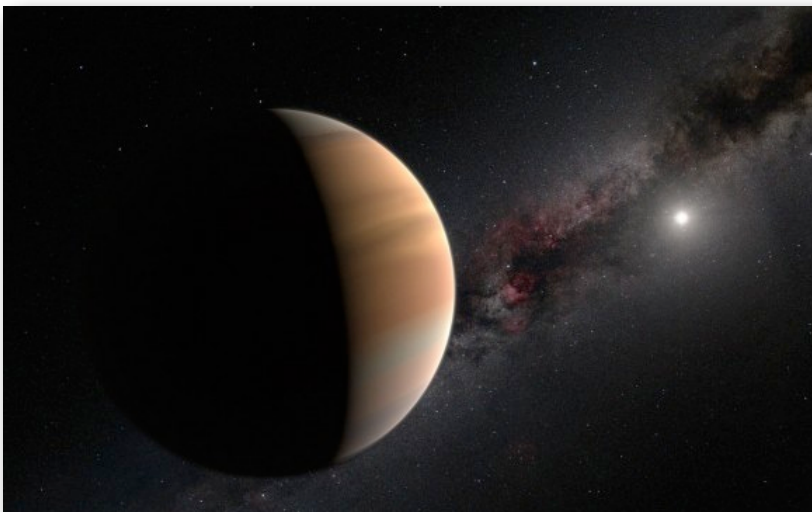


Images of comet 67P/Churyumov-Gerasimenko taken on July 14, 2014, by the OSIRIS imaging system aboard the European Space Agency's Rosetta spacecraft have allowed scientists to create this three-dimensional shape model of the nucleus. Image Credit: ESA/Rosetta/MPS for OSIRIS Team/MPS/UPD/LAM/IAA/SSO/INTA/UPM

and the Italian Space Agency, Rome. The Jet Propulsion Laboratory, a division of the California Institute of Technology, Pasadena, manages the U.S. participation in the Rosetta mission for NASA's Science Mission Directorate in Washington. Rosetta carries three NASA instruments in its 21-instrument payload. [The Rubber Duckie shape commented on earlier has been supplanted by a "weird potato" -ed]

Author: [Dr. Tony Phillips](#) | Production editor: [Dr. Tony Phillips](#) |
Credit: Science@NASA

NameExoWorlds: An IAU Contest to Name Exoplanets and Host Stars



For the first time, in response to the public's increased interest in being part of discoveries in astronomy, the International Astronomical Union (IAU) is organizing a worldwide contest to give popular names to selected exoplanets along with their host stars. The proposed names will be submitted by astronomy clubs and non-profit organisations interested in astronomy, and votes will be cast through the web platform NameExoWorlds. currently under development by the IAU and Zooniverse. The intention is that millions of people worldwide will be able to take part in the vote. Once the votes are counted, the winning names will be officially sanctioned by the IAU, allowing them to be used freely in parallel with the existing scientific nomenclature, with due credit to the clubs or organizations that proposed them. The main steps of the contest are described at <http://www.iau.org/news/pressreleases/detail/iau1404/> and involve a registration process for clubs and organizations followed at specific times by name submission. The naming process will take place on www.NameExoWorlds.org website. Stay tuned for more.

Long Live Cassini

It has been a decade since a robotic traveler from Earth first soared over rings of ice and fired its engine to fall forever into the embrace of Saturn. On June 30, 2014, the Cassini mission celebrated 10 years of exploring the planet, its rings and moons.

The Cassini spacecraft, carrying the European Space Agency's Huygens probe, arrived in the Saturn system on June 30, 2004, for a 4-year primary mission. Since 2008, NASA has granted the mission three extensions, allowing scientists an unprecedented opportunity to observe seasonal changes as the planet and its retinue completed one-third of their nearly 30-year-long trek around the sun.

"Having a healthy, long-lived spacecraft at Saturn has afforded us a precious opportunity," said Linda Spilker, Cassini project scientist at NASA's Jet Propulsion Laboratory in Pasadena, California. "By having a decade there with Cassini, we have been privileged to witness never-before-seen events that are changing our understanding of how planetary systems form and what conditions might lead to habitats for life."

After 10 years at Saturn, the stalwart spacecraft has beamed back to Earth hundreds of gigabytes of scientific data, enabling the publication of more than 3,000 scientific reports.

Ten of Cassini's top accomplishments and discoveries are:

- Huygens -first landing on a moon in the outer solar system (Titan)
- Discovery of active, icy plumes on the Saturnian moon Enceladus
- Saturn's rings revealed as active and dynamic
- Titan revealed as Earth-like world with rain, rivers, lakes and seas
- Studies of Saturn's great northern storm of 2010-2011
- Radio-wave patterns not tied to Saturn's interior rotation
- Vertical structures in the rings imaged for the first time
- Study of prebiotic chemistry on Titan
- Mystery of dual, bright-dark surface of the moon Iapetus solved
- First complete view of N. polar hexagon and discovery of giant hurricanes at both of Saturn's poles

In celebration of the 10th anniversary, members of the Cassini team selected some of their favorite images for a gallery, describing in their own words what makes the images special to them. The gallery is available at address at upper right.

<http://saturn.jpl.nasa.gov/news/cassinifeatures/10thannivimages/>

More information about Cassini is available at the following sites:

<http://www.nasa.gov/cassini>

<http://saturn.jpl.nasa.gov>

Preston Dyches/Whitney Clavin

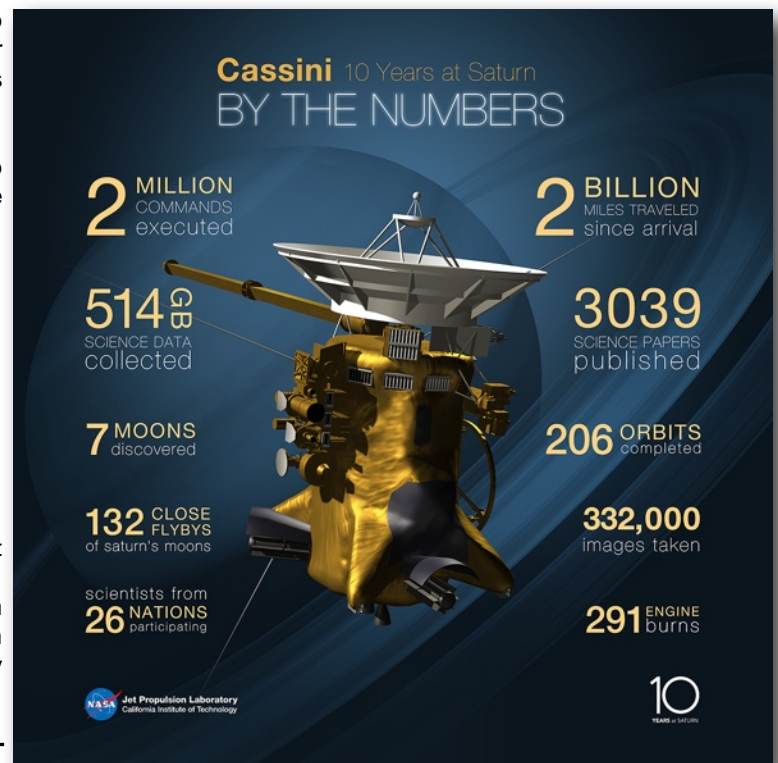
Jet Propulsion Laboratory, Pasadena, Calif.

818-354-7013 / 818-354-4673

preston.dyches@jpl.nasa.gov / whitney.clavin@jpl.nasa.gov

Further details about these top-10 discoveries are available at:

<http://saturn.jpl.nasa.gov/news/cassinifeatures/10thannivdiscoveries/>

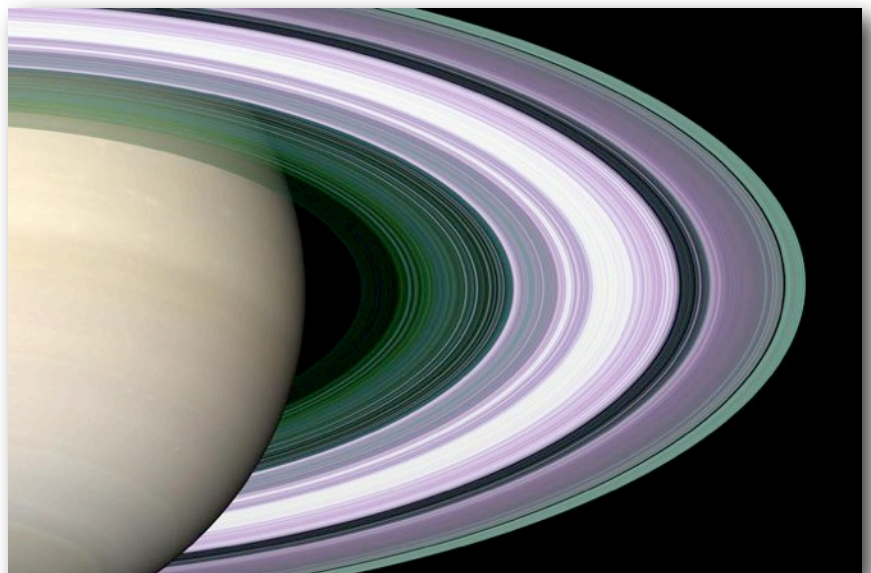


Radio Observations Reveal Ring Structure

Specially designed Cassini orbits place Earth and Cassini on opposite sides of Saturn's rings, a geometry known as occultation. Cassini conducted the first radio occultation observation of Saturn's rings on May 3, 2005. Three simultaneous radio signals of 0.94, 3.6, and 13 cm wavelength (Ka-, X-, and S-bands) were sent from Cassini through the rings to Earth. The observed change of each signal as Cassini moved behind the rings provided a profile of ring material distribution as a function of distance from Saturn.

This simulated image depicts the observed ring structure at about 10 kilometers (6 miles) in resolution. Color is used to represent information about ring particle sizes. Purple indicates a lack of particles less than 5 cm in size. Green and blue indicate particles smaller than 5 cm and 1 cm. The saturated broad white band near the middle of ring B is the densest region of ring B, where 2 of 3 radio signals were blocked at 10-km resolution, preventing accurate color representation. From other evidence, all ring regions appear to be populated by a broad range of particle size distribution that extends to boulder sizes (several to many meters across).

More at <http://saturn.jpl.nasa.gov>. Credit: NASA/JPL



Ocean on Saturn Moon Titan Could be as Salty as Dead Sea

Scientists analyzing data from NASA's Cassini mission have firm evidence the ocean inside Saturn's largest moon, Titan, might be as salty as the Earth's Dead Sea.

The new results come from a study of gravity and topography data collected during Cassini's repeated flybys of Titan during the past 10 years. Using the Cassini data, researchers presented a model structure for Titan, resulting in an improved understanding of the structure of the moon's outer ice shell. The findings are published in this week's edition of the journal *Icarus*.

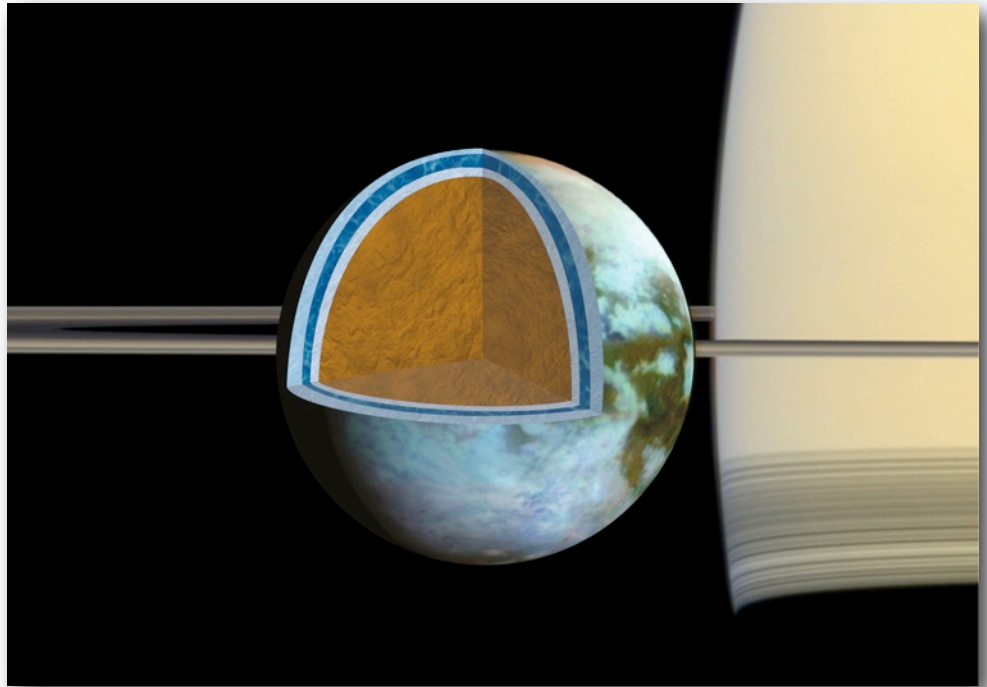
"Titan continues to prove itself as an endlessly fascinating world, and with our long-lived Cassini spacecraft, we're unlocking new mysteries as fast as we solve old ones," said Linda Spilker, Cassini project scientist at NASA's Jet Propulsion Laboratory (JPL) in Pasadena, California, who was not involved in the study.

Additional findings support previous indications the moon's icy shell is rigid and in the process of freezing solid. Researchers found that a relatively high density was required for Titan's ocean in order to explain the gravity data. This indicates the ocean is probably an extremely salty brine of water mixed with dissolved salts likely composed of sulfur, sodium and potassium. The density indicated for this brine would give the ocean a salt content roughly equal to the saltiest bodies of water on Earth.

"This is an extremely salty ocean by Earth standards," said the paper's lead author, Giuseppe Mitri of the University of Nantes in France. "Knowing this may change the way we view this ocean as a possible abode for present-day life, but conditions might have been very different there in the past."

Cassini data also indicate the thickness of Titan's ice crust varies slightly from place to place. The researchers said this can best be explained if the moon's outer shell is stiff, as would be the case if the ocean were slowly crystallizing, and turning to ice. Otherwise, the moon's shape would tend to even itself out over time, like warm candle wax. This freezing process would have important implications for the habitability of Titan's ocean, as it would limit the ability of materials to exchange between the surface and the ocean.

A further consequence of a rigid ice shell, according to the study, is any outgassing of methane into Titan's atmosphere must happen at scattered "hot spots" -- like the hot spot on Earth that gave rise to the



Hawaiian Island chain. Titan's methane does not appear to result from convection or plate tectonics recycling its ice shell.

How methane gets into the moon's atmosphere has long been of great interest

to researchers, as molecules of this gas are broken apart by sunlight on short geological timescales. Titan's present atmosphere contains about five percent methane. This means some process, thought to be geological in nature, must be replenishing the gas. The study indicates that whatever process is responsible, the restoration of Titan's methane is localized and intermittent.

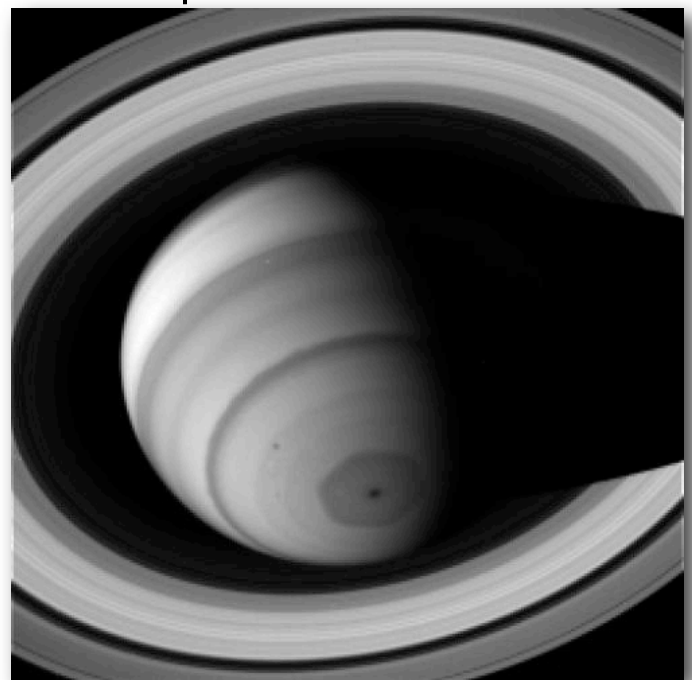
"Our work suggests looking for signs of methane outgassing will be difficult with Cassini, and may require a future mission that can find localized methane sources," said Jonathan Lunine, a scientist on the Cassini mission at Cornell University, Ithaca, New York, and one of the paper's co-authors. "As on Mars, this is a challenging task." For more about Cassini, visit <http://www.nasa.gov/cassini>

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Image below: Saturn's Polar Hexagon

We space people are very lucky to get glimpses of Saturn (and other planets!) regularly through the raw images feature on a few spacecraft websites. This allows anyone



to get a hold of the pictures as they come back from afar, almost live.

In an era where we are so used to high-definition pictures, examining these blurry, black-and-white shots feels novel. It makes the spacecraft seem like it is [in] action somehow: catching a glimpse of a ringed planet as it swings by, for example.

Link below has some of the latest gifts from the Cassini spacecraft, which is [celebrating 10 years in Saturn's system](#).

This page will feature on a regular basis, stories that are best viewed as video clips (or heard as audio) rather than read as text. Most are viewable in Youtube or as a video posted on the various astronomy information sites like **One-Minute Astronomer**, **EarthSky**, **Space.com**, **Physics World** or one of many **NASA space news** websites. See the BAS website LINKS page or the box at right for links to the sources used by SGN for much of the information in these pages. All have free subscription services that will send astronomy and space news directly to your email inbox.

Clicking on each link in blue below the articles on this page should take you directly to the video which you can then view in your web browser. If that doesn't work, then copy the entire address that is underlined (leave out any periods at the end of a sentence) open your web browser and paste it into address box.

Astronomy & Space News Sources:

- NASA: <http://science.nasa.gov/>
- EarthSky: <http://earthsky.org>
- Physics World: <http://physicsworld.com/>
- Universe Today: <http://www.universetoday.com/>
- Sky News: <http://www.skynews.ca/>
- Sky & Telescope: <http://www.skyandtelescope.com/>
- Astronomy: <http://www.astronomy.com/>
- Spaceweather: <http://spaceweather.com>
- One-Minute Astronomer: <http://oneminuteastronomer.com/>



Ten more Years for ISS

ScienceCasts: 10 More Years

http://science.nasa.gov/science-news/science-at-nasa/2014/14feb_10years/



Apollo 11 celebrates 45th Anniversary

Buzz Aldrin wants to know what you were doing on the July 20th, 1969 when he and Neil Armstrong stepped onto the Moon. Share your stories on his social media site by visiting the link below:

<http://www.youtube.com/Apollo45>



One Year to Pluto: New Horizons Approaches Target

ScienceCasts: One Year to Pluto

<http://www.youtube.com/watch?v=RDIsbN-e1qU&feature=youtu.be>



CBS coverage of Apollo 11 landing July 20, 1969 anchored by legendary broadcaster Walter Cronkite

CBS Coverage of Apollo 11 Lunar Landing(42:28)

<http://www.youtube.com/watch?v=E96EPHqT-ds#t=66>

Sagittarius (Sgr)

α Sagittarii - Rukbat
β Sagittarii - Arkab

γ Sagittarii - Al Nasl δ Sagittarii - Kaus Meridionalis
ε Sagittarii - Kaus Australis ζ Sagittarii - Ascella
σ Sagittarii - Nunki λ Sagittarii - Kaus Borealis π Sagittarii-Al Baldah

Sagittarius (the Archer) is the southernmost of the zodiacal constellations, lying between Capricornus to the east and Scorpius to the west. The central part of Sagittarius has a group of stars [an asterism] resembling in shape a giant teapot complete with spout and handle, an aid in identifying this constellation. The stars forming the handle and dome of the teapot comprise a group of stars known as the "Milk Dipper," another distinguishing feature. Sagittarius lies directly in the plane of the brightest part of the Milky Way; the Galactic Center is located in this constellation. The region is very rich in star clusters and nebulae. An enormous number of stars also lie in this region of the sky; it is a grand area for scanning with fieldglasses. Observe in binoculars the dark areas in the Milky Way around γ and δ Sagittarii; these are clouds of cosmic dust with no nearby stars to illuminate them. M 24 is an open cluster, impressive in binoculars, while M 8, the "Lagoon Nebula", is visible to the naked eye. M 22 is a magnificent globular cluster; its stars are of the 10th magnitude and fainter, but so compact they form an object barely visible to the naked eye.

DOUBLE STARS

	Mag.	Sep'n (s)	Location	Remarks
ζ	3.3-3.5	1	190030	
η	3.2-10	4	181537	
μ	4.0-11.0-9.5-9.5	17-48-50	181021	Quadruple.
π	3.7-3.8-6.0	1	190721	Triple.
54	5.4-8.9	46	190381	Yellow-Blue.

MESSIER OBJECTS

	Mag	Location	Remarks
M 8	-	180124	Diffuse Neb. "Lagoon Nebula", visible to naked eye.
M 17	-	181816	Diffuse Neb. "Horseshoe Neb", "Swan" or "Omega"
M 18	7.5	181717	Open Cl.
M 20	-	175923	Diffuse Neb. "Trifid Nebula"; very large, bright, several doubles, multiple stars
M 21	6.5	180223	Open Cl.
M 22	5.9	183324	Globular Cl. Called the finest after M13.
M 23	6.9	175419	Open Cl.
M 24	4.6	181618	Open Cl. Beautiful field.
M 25	-	182919	Open Cl.
M 28	7.3	182223	Globular Cl. Very condensed.
M 54	-	185231	Globular Cl.
M 55	-	193731	Globular Cl.
M 69	8.9	182832	Globular Cl.
M 70	9.6	184032	Globular Cl.
M 75	8.0	200322	Globular Cl. Most "open" of large glob.

Other Objects of Interest (Sag)

- NGC 6723** - Globular Cl. Loc'n. 185637
NGC 6822 - Irr. Gal. mag. 11. 194315.
R Sagittarii - Long per. (269 d) var. max mag 7.3. Location 191319
T Sagittarii - Long per. (392 d) var. max mag 8.0. Location 191317
W Sagittarii - Cepheid var., mag range 4.3-5.1. per. 7 d 15 h 55 min. Location 180230

A Messier check list can be found on the BAS website if you go to MAPS/CHARTS or here: <http://messier.seds.org/xtra/similar/dataRASC.html> for a list ordered by season. Try the Summer one.

Scorpius (Sco)

λ-Scorpii - Shaula

α-Scorpii - Antares ε-Scorpii - Wei v-Scorpii - Jabbah
 β-Scorpii - Graffias θ-Scorpii - Sargas σ-Scorpii - Al Niyat
 δ-Scorpii - Dschubba* κ-Scorpii - Girtab υ-Scorpii - Lesath
 [Note: γ-Scorpii is now σ-Librae -ed

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 v-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
NGC 6124- Open Cluster- Location 162240.
NGC 6231 -Open Cluster - Many doubles and triples in this field. Location 165142.

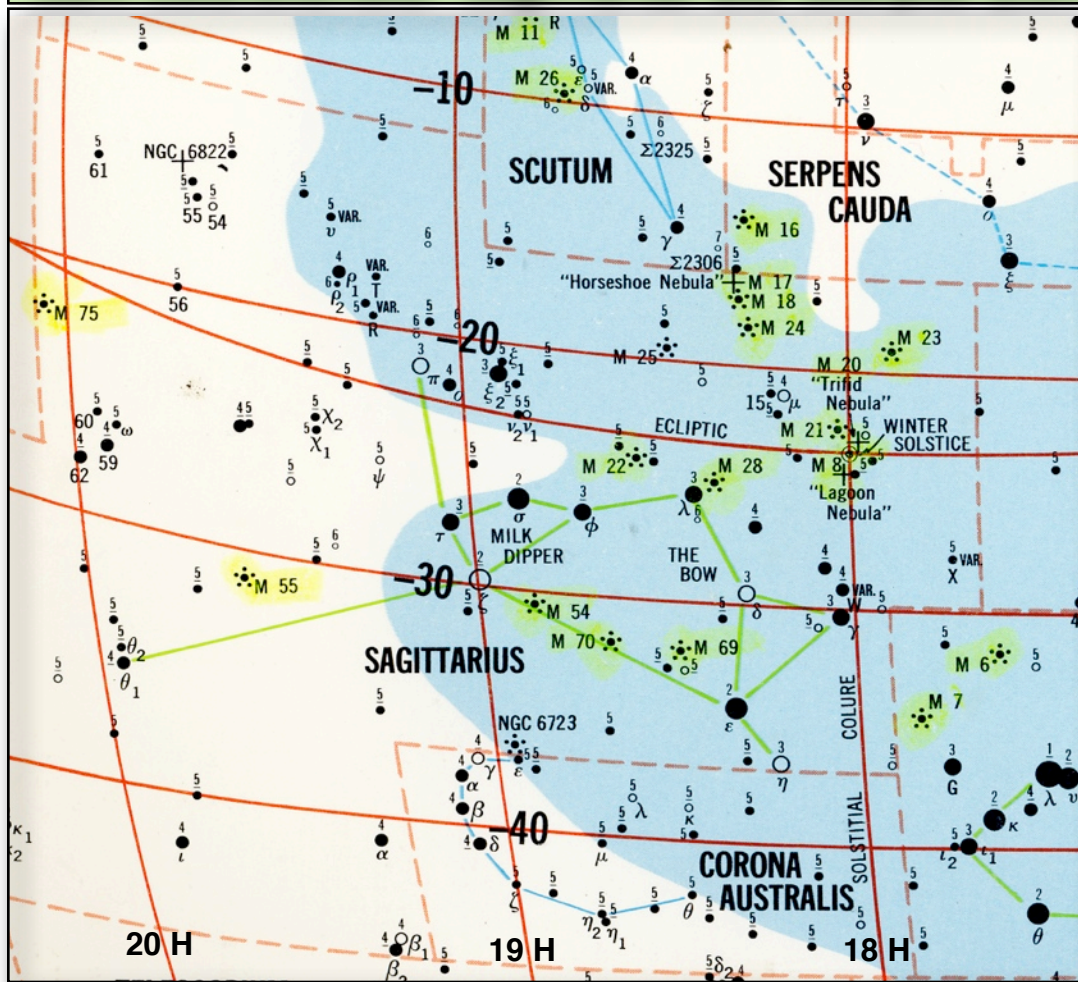
***Dschubba or δ-Scorpii**, flared in Aug 2000 from its usual 2.32 to 1.9 and reached 1.6 or 1.7 in 2003. It has since varied from 1.6 to 2.1 and brightened to 1.6 in July 2011. Dschubba is still 0.2 of a magnitude brighter than its original magnitude and bears watching.

A Messier Mini-Marathon Challenge

The summer Milky Way sky is the perennial favourite "hunting ground" for stargazers, and is especially rich in clusters of stars, particularly globular clusters. No less than **16 globular clusters** are found out of 30 Messiers that can be seen in Sgr, Sco, Oph/Ser and Scu, the constellations featured in this issue.

The result of a real physical distribution of globular clusters, they are found in a spherical volume with the gravitational centre being the nucleus of the MW. Since our Sun and planets are orbiting some distance from the nucleus (thank goodness!) we see globulars swarming around the core like moths to a streetlight.

We have BAS viewings at the Fox scheduled for June 28 and Aug 30, the Dark Sky Weekend July 25/26 and Starfest Aug 21-24. All are opportunities to see 30 Messiers in one night. Try it, you'll like it!



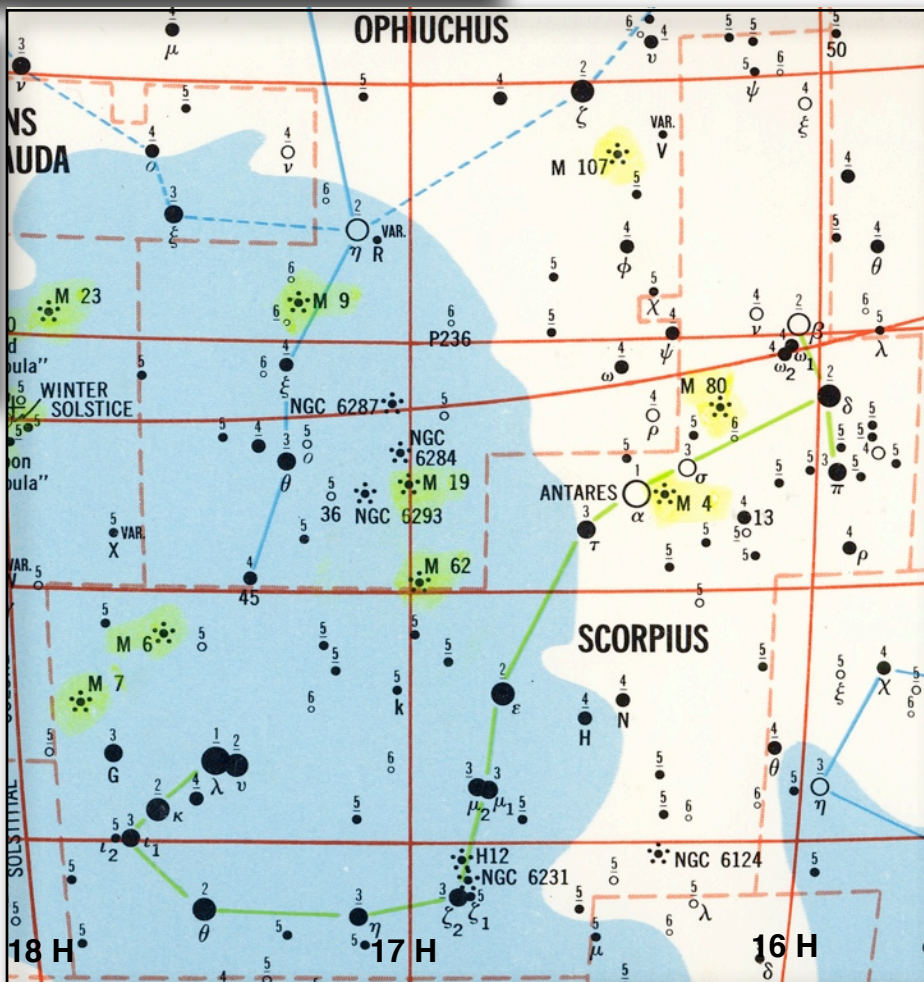
Sagittarius and Scorpius are in the sky such a short time that they are being presented this month at the time when they are at their best for viewing. What have been called the “Guardians of the Milky Way” are straddling the meridian in the southern sky in August and are as high as they get at our latitude in the northern hemisphere at this time. Add to that the fact that the Moon brightens the view in the first ten days or so of August. Furthermore, the stars are setting farther westward each night and by the end of the month, Sagittarius is low in the west by midnight. The best time to view these constellations is NOW -about the time you get this issue in the last week of July before the Moon gets too bright. What are you waiting for, the Milky Way is up there waiting...

Chart Legend	
●	Star Location
○	Double Stars
+	Nebulae
★	Clusters
●	Variable Stars
Var	

Messier Objects Galore: Sagittarius and Scorpius are home to 19 of the 110 objects in Messier’s list - about 17% -more than any other area of the sky. If you include two or three adjacent constellations that are also on or near the meridian, Scutum and Ophiuchus/Serpens, add 11 more. In a few hours of viewing, an observer could easily do a Messier Mini-Marathon and bag 30 Messier objects or over one-quarter of the list. Scu/Ser/Oph were featured in the Aug and Oct 2013 SGN issues which are still available on the BAS website. Here is the list of 11 objects in those three areas you could try for:

- Scutum** (see Oct 2013 SGN)
M 11 6.3 Open Cluster. Called semi-globular. “Wild Duck” cluster. [or “Borg Cube” -ed]
M 26 9.3 Open Cluster. Coarse.
- Ophiuchus** (see Aug 2013 SGN)
M 9 7.3 Globular Cl. Many minute stars.
M 10 6.7 Globular Cl. Rich in stars; easy to resolve.
M 12 6.6 Globular Cl. Very fine, bright, condensed center. Easy to resolve.
M 14 5.7 Globular Cluster. Very large.
M 19 6.6 Globular Cluster.
M 62 6.6 Globular Cluster.
M 107 9.2 Globular Cluster.

- Serpens** (see Aug 2013 SGN)
M 5 6.2 Globular Cl. Almost as good as M13 in Her a very beautiful object. [Yes Indeed! -ed]
M 16 6.4 Open Cluster. [Eagle or Star Queen Nebula surrounds this cluster. -ed]



- August**
- 02 09:27 Spica 2.3°S of Moon
 - 03 06:02 Mars 2.2°S of Moon
20:50 **FQ** Moon rises locally at 1:51 pm DST
 - 04 06:54 Saturn 0.0°N of Moon: Occultation (not visible in N.America, try SE Asia, Australia).
 - 06 18:29 Venus 6.5°S of Pollux
 - 08 12:00 Mercury Superior Conj. (invisible behind Sun)
 - 10 13:43 Moon at Perigee: 356 897 km
14:09 **FM** rises locally at 8:19 pm DST
 - 12 20:00 Perseid Meteor Shower
 - 17 08:26 **LQ** Moon rises locally at 12:33 am DST
 - 18 01:05 Venus 0.9°S of Beehive Cl. M 44
02:48 Jupiter 1.1°S of Beehive Cl. M 44
13:46 Aldebaran 1.6°S of Moon
 - 24 02:09 Moon at Apogee: 406 523 km
 - 25 10:13 **NM** rises locally at 5:46 am DST
 - 27 01:33 Mercury 3.4°N of Moon
 - 29 09:00 Neptune at Opposition (mag 7.8) visible all night
15:08 Spica 2.5°S of Moon
 - 31 15:21 Saturn 0.4°S of Moon: Occultation from 1:28 pm to 1:55 pm DST -daytime event may be visible?
19:43 Mars 4.1°S of Moon

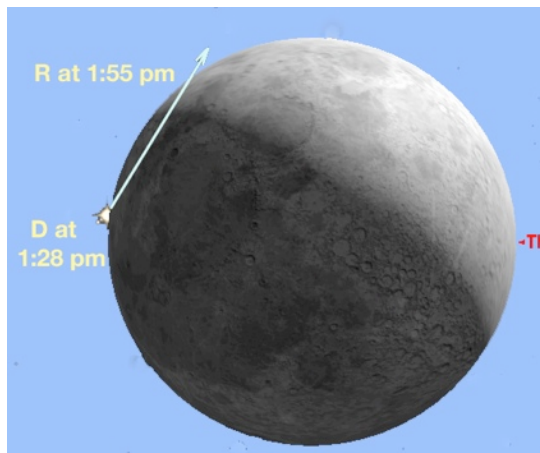
BAS Events

- Aug 2 (FQ) Moongaze at Inverhuron Pk.** Share the **Moon, Mars and Saturn** with campers after dark (9 pm). BAS members with scopes interested in helping contact John H. for details.
- Aug 6 Wed BAS meeting** at ES Fox Observatory 7 pm Topic: Meteorites with Mike Tettenborn. Bring a lawn chair.
- Aug 8 Fri (FM-2) Public viewing** Grey Roots Museum parking lot, 9 pm. Members with scopes appreciated. Contact stargazer@wightman.ca or lrodgers@bmts.com to confirm.
- Aug 12 Tue (FM+2) PERSEIDS viewing** at ES Fox Observatory after dark, gibbous Moon rises by 9:30 pm, 90/h. Come dressed for a cool evening and bring bug spray.
- New: Aug 16 (LQ) Stargaze at MacGregor Pk.** Share **Mars, Saturn, Milky Way** with campers after dark (9 pm). BAS members with scopes interested in helping contact John H. for details.
- Aug 21-24 Starfest 2014** More information at <http://www.nyaa.ca/index.php?page=/sf14/sf.home14> The best annual star party in North America organized by the North York AA
- Aug 30 Sat (FQ-3) BAS viewing @Fox** -the regular NM viewing night at the Fox, viewing Saturn, Mars and objects in Milky Way.

Special Events

Daytime Occultation of SATURN August 31

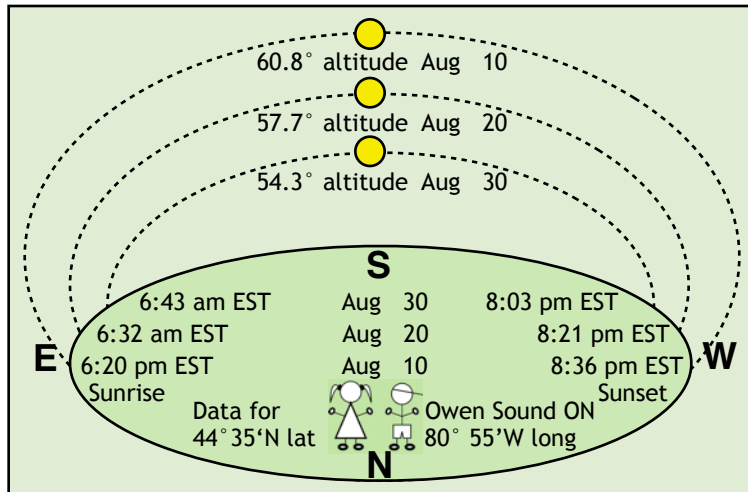
A daytime occultation of Saturn occurs for North America on Sunday August 31. Starry Night Pro shows Saturn behind the Moon from 1:28 pm to 1:55 pm DST. Moonrise occurs about 12:44 pm and Saturn follows a few minutes later. The occultation starts when they are about 6° up and ends with the pair about 10° up. Having a flat eastern horizon is critical to viewing this event. A GOTO scope is not absolutely essential as the fat crescent should be visible above the eastern horizon as long as it is clear in that direction. Saturn's apparent magnitude is 0.60. Disappearance occurs on the dark limb and reappearance is on the bright limb of the Moon. Good luck!



Planets

MERCURY, brightens from 2.5 to -0.6 mag in August and on August 12 is 21° from the Sun. It stays near Venus from August 12 to 20. Both eastward before sunrise. **VENUS**, brightness drops to -3.8 by mid-month. A thin last crescent Moon is closest to Venus on August 24 and on the 25th the crescent appears near Mercury. **MARS** (mag. 0.2) is now setting around 1 am and by mid-month will be setting before midnight. Now less than 10 arc-seconds across, it shrinks to 8.4" by month end. **JUPITER**, (-1.8) is very low (10°) at sunset and passes behind the Sun on August 24. It reappears as a morning object later this summer. **SATURN**, (mag 0.5) is on the downward slide towards the western horizon this month. By month end it is setting around midnight. Ring tilt is closing but still 21 degrees in July. Both **URANUS**, (5.8) and **NEPTUNE**, (7.8) rise after midnight at the start of July, but by the end they are rising before midnight (Neptune first). Both **asteroid, Vesta (6.1)** and dwarf planet, **Ceres (7.0)** are in the same part of the dawn sky as Mars. They are **very** close to each other on August 5. Charts are available on the BAS website. **PLUTO** (mag. 14) is above the horizon all night long reaching opposition August 4. On August 22, it is only 2.5 minutes away from 5.2 magnitude star 29 Sag. Pluto finder charts for 2014 are now found on the BAS website.

The diagram below gives the sunrise/sunset times and the Sun's altitude on three dates this month. The Sun continues slowly losing elevation during August after reaching solstice a month ago.



Daytime astronomy is covered in detail at the Calgary RASC website here: <http://calgary.rasc.ca/daystars/index.htm>

Aug 2014

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

By permission Univ. of Texas McDonald Obs.

BAS Member Loaner Scopes

Solar H-alpha scope now out on loan.

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

One 12-inch Dob available.

Only one 12-inch loaner telescope is available for the summer. (The other is at Lion's Head "POD") Two of our two **8-inch dobsonians** are presently out on loan. Contact Brett T. or Aaron T. for on availability. Scopes come in periodically so keep checking with Brett or Aaron if you are interested in a loaner.



SGN Classified Ads Section

(Now also on our website)

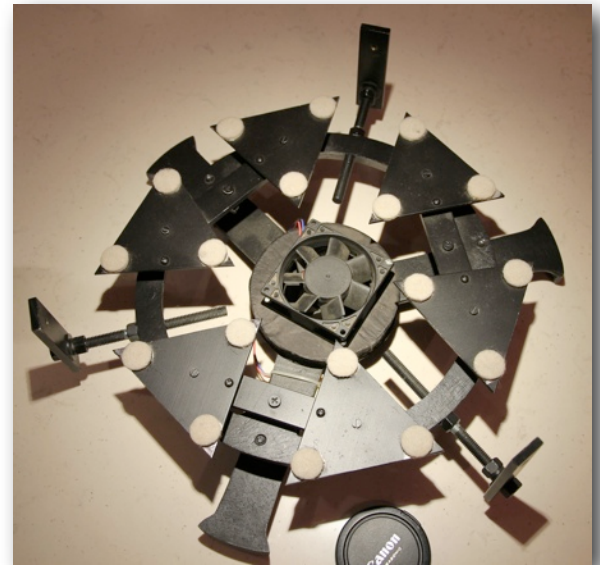
FOR SALE: Televue Pronto Price reduced to \$600 !

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 \$ 600.-- Contact Anton VanDijk 519 376-9912 ravand@rogers.com



FOR SALE: 16-inch mirror cell

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



September meeting FREE Stuff and SWAP Table

Lots of odds and ends have been donated to BAS that are surplus to our needs. At the Sep meeting we will have those items on display. Bring your own items as well (clearly identified) and indicate your asking price or just put them on the FREE table. Contact John (stargazer@wightman.ca) if you have any questions.

Here is a partial list of components that are available:

- several 2-inch refractors with 0.965 eyepieces,
- wood and aluminum tripods for previously-mentioned refractors
- eyepieces, barlows, extension tubes for 0.965 focusers,
- 90° and 45° diagonals (1.25 inch),
- 90° diagonals (2 inch),
- 1.25 inch short focuser (curved base, not adaptable for 2-inch)
- 2 and 3 inch telescope tubes,
- miscellaneous small finder scopes and brackets,
- miscellaneous adapters.

You are welcome to bring your own stuff to give away or to sell. Contact John H. if you have something to bring.

Col. Chris Hadfield at Jasper Dark Sky Festival



If you happen to be out in Jasper Park this October, here is an opportunity you will not want to miss. The 10-day dark sky celebration which includes lots of stargazing during that time, also features other events. Edmonton's Symphony String Orchestra will play, so will Chris Hadfield on the last weekend. Jay Ingram, Alan Dyer, Peter McMahon, (Wilderness Astronomy Contributing Editor for Sky News), Wilfred Buck, (Cree Aboriginal Story Teller) will be there too.

Although nighttime viewing at various dark sky sites is featured, daytime solar viewing is also available. The October 23 partial solar eclipse will be observed and from Jasper, the event runs from 2:38 to 5:14 and the sun is still 10° high at the end. At maximum, about 65% of the sun will be covered. There are many free events, but tickets for the Hadfield event are steep. Expect to shell out over \$100 plus HST for the cheap seats. VIP seating is twice that.

Relativity

