

SOCIETY NEWS



Its that time of year again, everyone is supposed to feel filled with “goodwill to all men”. Well I am, perhaps not to all but certainly to all good men and women who have contributed VAS during the last 12 months.

There’s a fair old list but I’d really like to pick out a few people who have really helped in 2016. Let’s start with:

- John Gaudion
- Peter & Sheila Burgess
- Pam Ash
- Dudley Johnson
- Martyn Weaver
- Graham Osborne
- The members of the Committee
- and a lot more who just got stuck in!

Without you we couldn’t continue. I really hope I’ve not missed anyone out but if I have please come and tell me! Thank You all!



Brian Curd
Editor New Zenith

VAS Website: wightastronomy.org

Submissions or letters to New Zenith are always welcome and should be sent to:

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Material for the next issue by the 6th of the month please.

The Vectis Astronomical Society and the Editor of the New Zenith accept no responsibility for advice, information or opinion expressed by contributors.

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Observatory Diary

Monday, 19.30hrs	Members Only and by arrangement Telescope and night sky training. Please contact Martyn Weaver 07855 116490
Thursday, 19.30hrs	Members and Public. Informal meeting and observing

Contents this Month

<i>Society News</i>	1
<i>Sky Maps</i>	34
<i>Request for Images</i>	6
<i>Opposition and Conjunction</i>	7
<i>Brighstone Christmas Tree Festival</i>	8
<i>Anniversary Dinner</i>	8
<i>Observatory Progress</i>	9
<i>NGC2264, Cone Nebula, Fox Fur Nebula</i>	9
<i>Mars ice deposit</i>	10
<i>Martian Water as a Future Resource</i>	10
<i>ESA: Mars lander crash cause</i>	11
<i>NASA demonstrates EM Drive theor</i>	12

2016 Monthly Meetings

Date	Subject	Speaker
Please check wightastronomy.org/meetings/ for the latest information		
28 Oct	Simulations of Dwarf Galaxies	Dr David Williamson
25 Nov	Stellar population Modelling	Dr Claudia Maraston

2017 Monthly Meetings

Date	Subject	Speaker
Please check wightastronomy.org/meetings/ for the latest information		
27 Jan	Dark nebula - Shrouds of night	Owen Brazell
24 Feb	TBA	TBA
24 Mar	TBA	TBA
28 Apr	Radiation protection in space (for manned missions)	Dr Elizabeth Cunningham
26 May	Mapping orbits around black holes and neutron stars	Dr Diego Altamirano
23 Jun	"It's not all rocket science" - progression of The Needles 'Black Knight Rocket' site	Mike Kelleway
28 Jul	Pseudoastronomy: Planet X, Zetans, and Lost Civilisations	Stephen Tonkin
25 Aug	Citizen Science	Chris Lintott
22 Sep	TBA	TBA
27 Oct	TBA	TBA
24 Nov	TBA	TBA

Observatory Visits Booked

December

5th 6th Newport Scout Group 18.30-20.00

It would be appreciated if members could avoid using the observatory at these times.

VAS Contacts 2014/15

President	Barry Bates president@wightastronomy.org
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Membership Secretary	Norman Osborn members@wightastronomy.org
NZ Distribution	Graham Osborne
Others	Mark Williams, Nigel Lee & Stewart Chambers

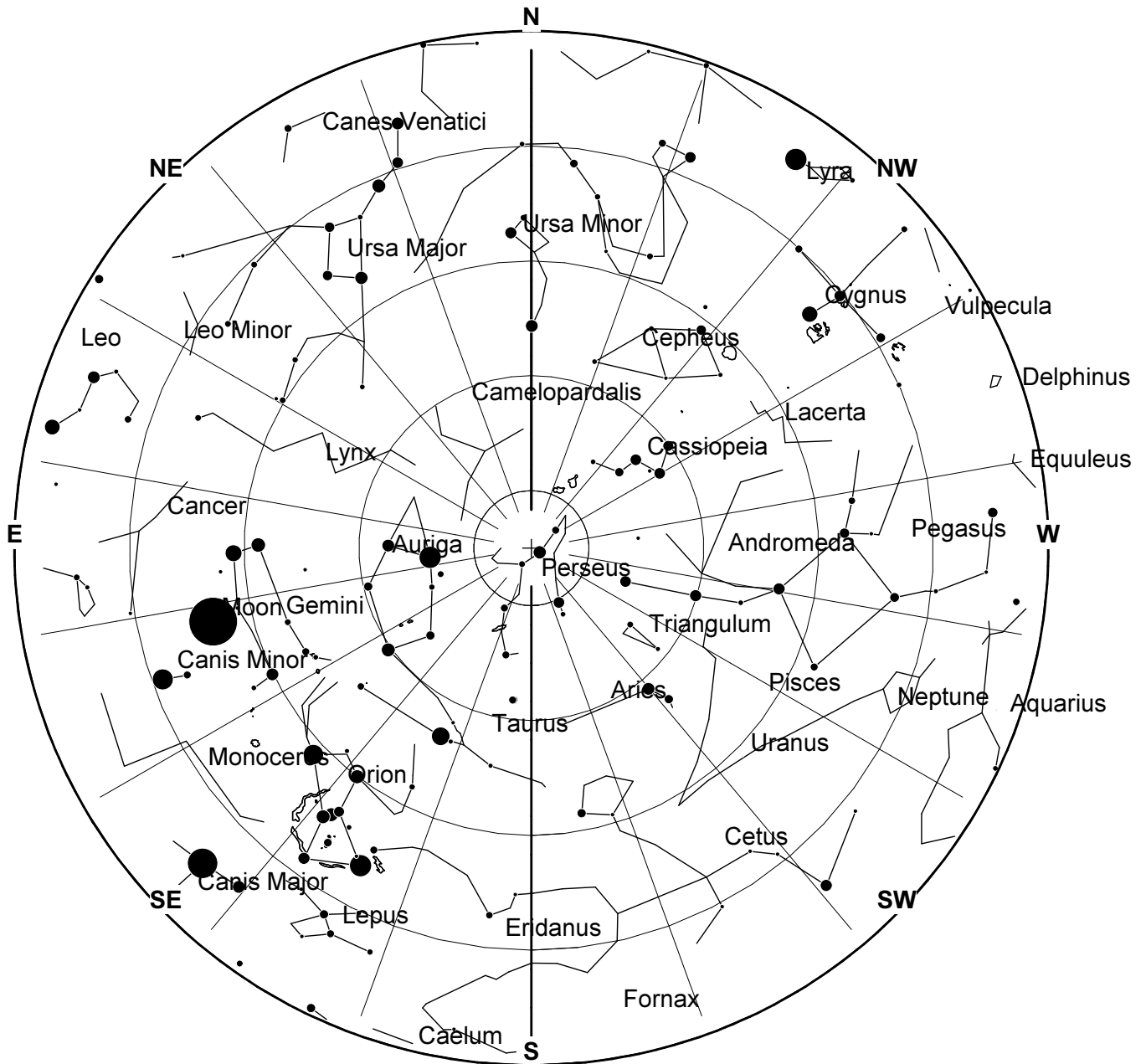
Important

Members using the observatory outside normal Thursday meetings **MUST** enter a line or two in the Observatory Log Book.

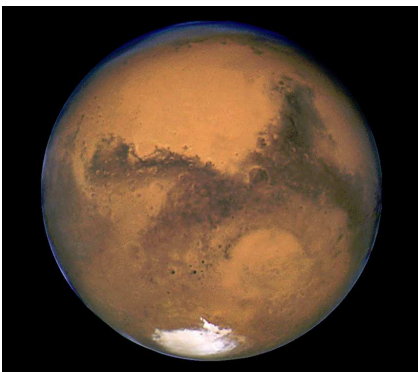
On several occasions, lights, heaters and the Meade LX200 have been left on!

When leaving, please ensure all is secure and all lights, heaters and telescopes are **TURNED OFF**.

DECEMBER 2016 SKY MAP



View from Newchurch Isle of Wight UK - 2200hrs - 15 December 2016



Mars is the 4th planet from the Sun and the second-smallest planet in the Solar System. Named after the Roman god of war, it is often referred to as the “Red Planet” because the iron oxide on its surface gives it a reddish appearance. Mars is a terrestrial planet with a thin atmosphere, having surface features reminiscent of the impact craters of the Moon and the valleys, deserts, and polar ice caps of Earth.





The rotational period and seasonal cycles of Mars are likewise similar to those of Earth, as is the tilt that produces the seasons. Mars is the site of Olympus Mons, the largest volcano and second-highest known mountain in the Solar System, and of Valles Marineris, one of the largest canyons in the Solar System. Mars has two moons, Phobos and Deimos, which are small and irregularly shaped.

This article is licensed under the [GNU Free Documentation License](#).

It uses material from the Wikipedia article “Mars”.

DEC 2016/JAN 2017 NIGHT SKY

Moon Phases

	New	First Qtr	Full	Last Qtr
				
Dec 2016	29th	7th	14th	21st
Jan 2017	28th	5th	12th	19th

The Winter Solstice, our shortest day and the point at which the Sun is at its most southerly declination occurs at 10:41 on December 21.

Planets

Mercury

Look for Mercury low in the southwest just after sunset around mid December; it is rather poor apparition being already quite low down at sunset and setting only about an hour after the Sun. There is a second opportunity to spot Mercury during the second and third week of January, this time low in the morning just before sunrise. Again it is a poor apparition; the orbital geometry is changing from favouring the planets in the morning sky to the evening sky.

To make up, weather permitting, Mercury will put on a good show in March.

Venus

Throughout both December and January Venus will be easily visible in the south western sky after sunset. It steadily improves getting higher in the sky during the period. On the 2nd & 3rd of January there is a nice grouping with the thin crescent moon and the much fainter Mars. During the last few days of January there is a fairly close conjunction with Mars and on the 31st another grouping with the Moon.

Mars

For the last few months Mars has changed its position in the evening sky only very slightly as it slides towards the Sun. It is the only bright object in that part of the sky and with its distinctly reddish colour it is easily recognised. Mars spends most of its time almost stationary either in the evening or morning sky, the only activity being to disappear for a short while behind the Sun or spending a brief period rushing from the eastern sky in the morning to the western evening sky where it is now.

Jupiter

Jupiter is visible in the morning sky with its position improving throughout the period. Look for it in the southeast at about 6 am at the beginning of December, and by the end of January to the west of south at the same time. Jupiter is one of the brightest planets, second only to Venus, this makes it an unmistakable object, there is nothing comparable in that part of the sky.

Saturn

During almost the whole of December and January Saturn is behind the Sun and not visible. During the last fortnight of January it may become visible low down in the pre dawn sky, but is not well placed for observation.

Uranus

Uranus is very slow moving in the constellation of Pisces quite close to the similar brightness stars 88 and Zeta Piscium. The three objects make a triangle with Uranus being at the eastern most point.

Neptune

Neptune can be found in the constellation of Aquarius located a little under 2° west of the star Lambda Aquarii. On the 12th of January it is just 22 arc seconds east of the very much brighter Venus. This would be a good opportunity to use Venus as a guide, but it is quite low down as the sky gets dark enough to see it. Venus being so much brighter and in the same field of view may make it difficult to see.

Deep Sky

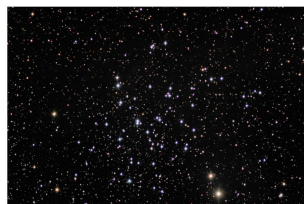


M76 The Little Dumbbell Nebula

RA 1h 43m

Dec 51° 37' mag 12

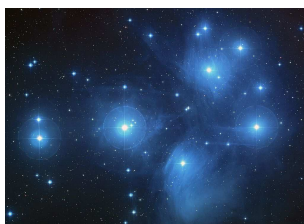
Just under one degree in the direction of Cassiopeia from Phi Persei lies one of the faintest of the Messier objects; a small bipolar planetary nebula that, as its name implies looks like a miniature version of the famous Dumbbell Nebula. At magnitude 12 it is beyond the reach of all but the largest binoculars, however in medium sized telescopes, with averted vision the two halves of the dumbbell can be seen. It was once considered to be two distinct objects and was given two NGC numbers NGC651 & 651.



NGC 1647 Open Cluster
RA 4h 46m Dec 19° 7'

Scanning with a pair of 10x50 binoculars from Aldebaran towards Elnath, (the star often shown shared with Auriga) just

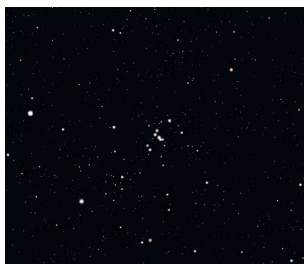
as Aldebaran is leaving the field of view there in the centre should be a fuzzy triangular patch of stars about the same size as the full moon. This is NGC 1647. Like many galactic clusters aperture is more important than magnification, an increased aperture will show more members of the cluster and allow them to be resolved whereas magnification will lessen the visual impact of the overall cluster.



M45 Pleiades
RA 3h 47m
Dec 24° 13' mag 1.4

Known since ancient times as a herald of the wet season, the Pleiades is probably the most famous of all star clusters. It is

an object that has something for all observers whether they are using naked eye, binoculars or a telescope.



NGC 1662 Open Cluster
RA 4h 49m
Dec 10° 54' mag 6.4

About 2 degrees towards the Hyades from the northern tip of Orion's shield can be found this large but rather sparse group of stars. About half way

along the lower edge is a small diamond of tenth magnitude stars that along with an 11th magnitude outsider, form a group that has a resemblance to a miniature, slightly squashed Delphinus.

Peter Burgess



REQUEST FOR IMAGES



Saturn captured using a Samsung CCTV camera attached to the VAS LX200. Credit: B. Curd

In an effort to attract new members to VAS and to show what can be achieved by amateur astronomers, we are going to have a picture gallery on the website.

In order for us to "hit the road running" we would like as many members as possible to contribute their astronomical photographs.

Simon Plumley is leading the project and will be the main contact at splumley69@gmail.com.

It is important that the gallery contains a complete range of images, beginners, intermediate and expert. It should also show common mistakes and equipment limitations - *see mine above* ;)

Of course if you'd like to contribute anonymously that's fine, just make it **very** clear when you email your images.

We'd prefer JPEG images with your name and brief details of what scope/camera you used.

You are welcome to embed copyright watermarks into your pictures and we will credit all images.

Please email your images and details to Simon

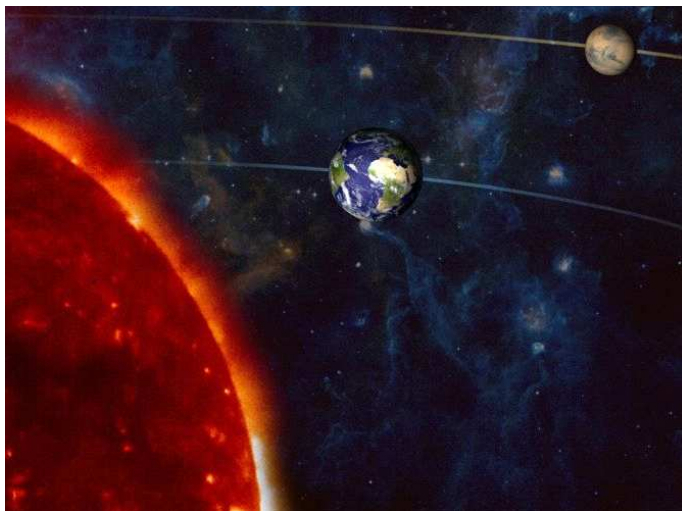
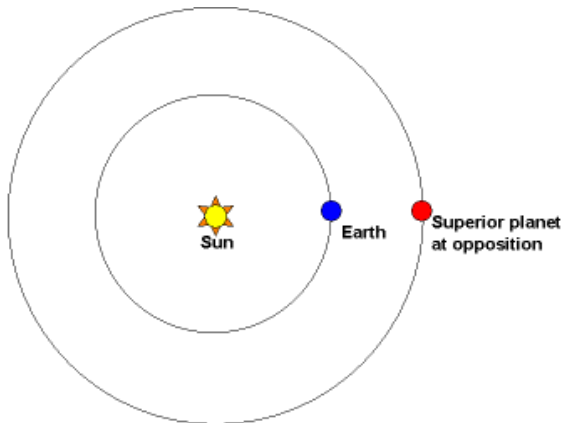


Orion Nebula Credit: Simon Plumley

OPPOSITION AND CONJUNCTION

In positional astronomy, two celestial bodies are said to be in opposition when they are on opposite sides of the sky, viewed from a given place (usually Earth). Opposition occurs only in superior planets (see the diagram). The Moon, which orbits Earth rather than the Sun, is said to be in opposition to the Sun at full moon; the Earth is then approximately between them. A superior planet (one with an orbit farther from the Sun than Earth's) is in opposition when Earth passes between it and the Sun.

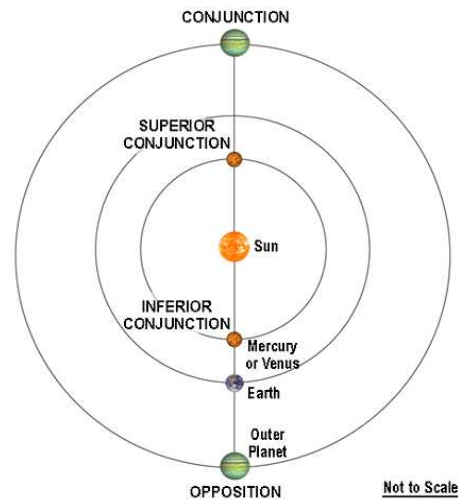
The opposition of a planet is a good time to observe it, because the planet is then at its nearest point to the Earth and in its full phase. The planets Venus and Mercury, whose orbits are smaller than Earth's, can never be in opposition to the Sun.



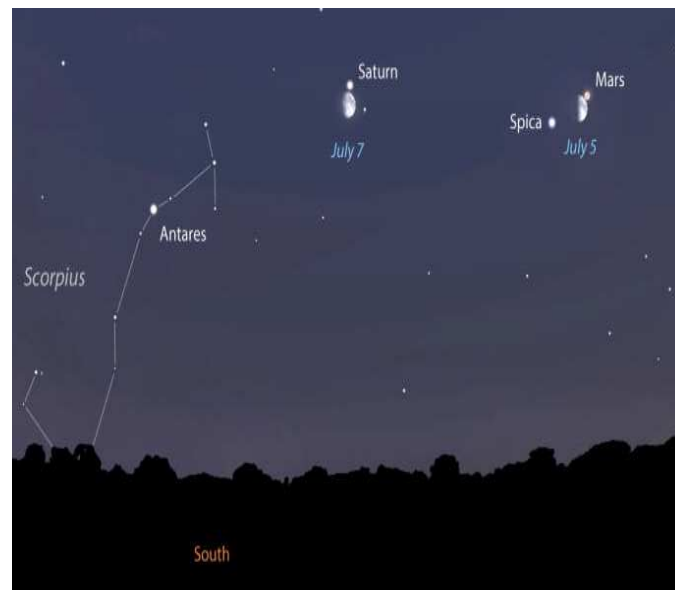
A conjunction is the apparent meeting or close approach of any two objects in the sky. This does not mean that they are physically close in space, merely that they appear along the same line of sight. One object may be vastly further away, and indeed this is usually the case.

The Moon is in conjunction with the Sun at the phase of New Moon, when it moves between the Earth and Sun and the side turned toward the Earth is dark.

Inferior planets—those with orbits smaller than the Earth's (Venus and Mercury)—have two kinds of conjunctions with the Sun.



An inferior conjunction occurs when the planet passes approximately between Earth and Sun; if it passes exactly between them, moving across the Sun's face as seen from Earth, it is said to be in transit. A superior conjunction occurs when Earth and the other planet are on opposite sides of the Sun, but all three bodies are again nearly in a straight line. Superior planets, those having orbits larger than the Earth's, can have only superior conjunctions with the Sun.



In this image Saturn and Mars are said to be in conjunction. This event can be defined when using either an equatorial or an ecliptic celestial coordinate system, in which any two astronomical objects (e.g. asteroids, moons, planets, stars) have the same celestial longitude, normally as when observed from the Earth (geocentric).

Elaine Spear

BRIGHSTONE CHRISTMAS TREE FESTIVAL



VAS has entered the Xmas tree festival this year, and our tree will be in the main St Mary's Church in Brighstone village. It is a lovely festival with over 200 trees on show, so do go along and try and spot our tree.

The Festival runs from 8th - 11th December 2016 10am to 5pm and trees are displayed at:

- *Brighstone Methodist Church*
- *St Mary's Church*
- *Brighstone Social Club*
- *The Wilberforce Hall*
- *The Three Bishops*
- *Brighstone Library*
- *Mottistone Church*
- *Isle of Wight Pearl*

The VAS tree will be on display until Boxing Day.

Elaine Spear



ANNIVERSARY DINNER



Over 20 VAS members came along to our anniversary dinner at Breeze, Island Harbour.

This was our first visit to this venue and by all reports received, it was impressive. For a function like ours it was good to have a room to ourselves (the extension on the right of the picture above).



Great to see everyone together.

OBSERVATORY PROGRESS

Here we are then, a couple of photos showing the new bit of the observatory. OK, so it's not quite finished but we really aren't very far away now. There is a little bit of floor levelling and fitting of carpet tiles but otherwise the area is pretty much finished.



Astro-Photography

The right hand side is the new astro-photography area and to the left is the maintenance area. We need to box in the meters and fuseboard but the area there is dedicated to astro-photography. Please respect the space as this is possibly the current centre of interest for the whole Society.

Repairs Area

The left hand side of this space will be allocated to equipment repair and maintenance as well as a central storage space for all the bits and pieces which seem to be distributed around the building at the moment. You may spot the new drop down screen at the top right. It may need moving a bit nearer the window but has already paid for itself from recent donations from the Scouts and Townswomen's Guild.

NGC2264, GONE NEBULA, FOX FUR NEBULA



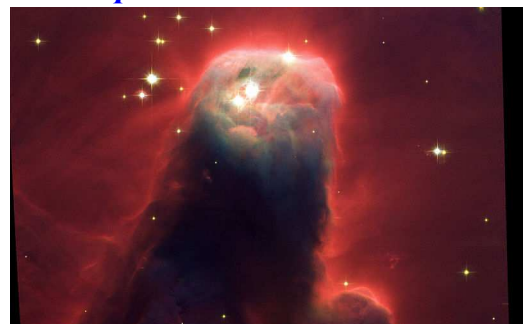
This wide-field image of the Christmas Tree Cluster was taken at the National Science Foundation's 0.9-meter telescope on Kitt Peak with the NOAO Mosaic CCD camera.

Also known as NGC2264, it is an open cluster of stars embedded in a diffuse nebula. It is located in the constellation of Monoceros, the Unicorn. The image also contains two famous nebula. At the bottom center of the image is the Cone Nebula, and to the upper left is the Fox Fur Nebula.

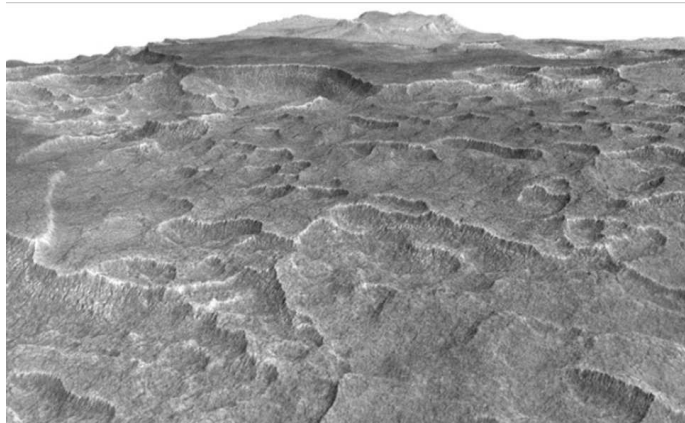
The bright star just above the center of the image is known as S Mon. The gentle arcs in orange and blue near the center of the image are Herbig Haro objects, jets of gas from protostars embedded in the nebula. In this image north is up and east is to the right.

This image was created by combining emission-line images in Hydrogen-alpha (red-orange), Oxygen [O III] (light blue) and Sulfur [S II] (blue-violet).

Source: <https://www.noao.edu/>



MARS ICE DEPOSIT HOLDS AS MUCH WATER AS LAKE SUPERIOR



Frozen beneath a region of cracked and pitted plains on Mars lies about as much water as what's in Lake Superior, largest of the Great Lakes, researchers using NASA's Mars Reconnaissance Orbiter have determined.

Scientists examined part of Mars' Utopia Planitia region, in the mid-northern latitudes, with the orbiter's ground-penetrating Shallow Radar (SHARAD) instrument. Analyses of data from more than 600 overhead passes with the onboard radar instrument reveal a deposit more extensive in area than the state of New Mexico. The deposit ranges in thickness from about 260 feet (80 meters) to about 560 feet (170 meters), with a composition that's 50 to 85 percent water ice, mixed with dust or larger rocky particles.

At the latitude of this deposit -- about halfway from the equator to the pole -- water ice cannot persist on the surface of Mars today. It sublimates into water vapor in the planet's thin, dry atmosphere. The Utopia deposit is shielded from the atmosphere by a soil covering estimated to be about 3 to 33 feet (1 to 10 meters) thick.

"This deposit probably formed as snowfall accumulating into an ice sheet mixed with dust during a period in Mars history when the planet's axis was more tilted than it is today," said Cassie Stuurman of the Institute for Geophysics at the University of Texas, Austin. She is the lead author of a report in the journal *Geophysical Research Letters*.

Mars today, with an axial tilt of 25 degrees, accumulates large amounts of water ice at the poles. In cycles lasting about 120,000 years, the tilt varies to nearly twice that much, heating the poles and driving ice to middle latitudes. Climate modeling and previous findings of buried, mid-latitude ice indicate that frozen water accumulates away from the poles during high-tilt periods.

Martian Water as a Future Resource

The name Utopia Planitia translates loosely as the "plains of paradise." The newly surveyed ice deposit spans latitudes from 39 to 49 degrees within the plains. It represents less than one percent of all known water ice on Mars, but it more than doubles the volume of thick, buried ice sheets known in the northern plains. Ice deposits close to the surface are being considered as a resource for astronauts.

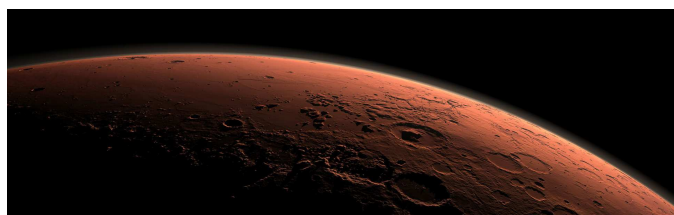
"This deposit is probably more accessible than most water ice on Mars, because it is at a relatively low latitude and it lies in a flat, smooth area where landing a spacecraft would be easier than at some of the other areas with buried ice," said Jack Holt of the University of Texas, a co-author of the Utopia paper who is a SHARAD co-investigator and has previously used radar to study Martian ice in buried glaciers and the polar caps.

The Utopian water is all frozen now. If there were a melted layer -- which would be significant for the possibility of life on Mars -- it would have been evident in the radar scans. However, some melting can't be ruled out during different climate conditions when the planet's axis was more tilted. "Where water ice has been around for a long time, we just don't know whether there could have been enough liquid water at some point for supporting microbial life," Holt said.

Utopia Planitia is a basin with a diameter of about 2,050 miles (3,300 kilometers), resulting from a major impact early in Mars' history and subsequently filled. NASA sent the Viking 2 Lander to a site near the center of Utopia in 1976. The portion examined by Stuurman and colleagues lies southwest of that long-silent lander.

Use of the Italian-built SHARAD instrument for examining part of Utopia Planitia was prompted by Gordon Osinski at Western University in Ontario, Canada, a co-author of the study. For many years, he and other researchers have been intrigued by ground-surface patterns there such as polygonal cracking and rimless pits called scalloped depressions -- "like someone took an ice-cream scoop to the ground," said Stuurman, who started this project while a student at Western.

More at: <https://www.sciencedaily.com>



ESA: MARS LANDER CRASH CAUSED BY 1 SECOND INERTIAL MEASUREMENT



PARIS — *The European Space Agency on Nov. 23 said its Schiaparelli lander's crash landing on Mars on Oct. 19 followed an unexplained saturation of its inertial measurement unit, which delivered bad data to the lander's computer and forced a premature release of its parachute.*

Polluted by the IMU data, the lander's computer apparently thought it had either already landed or was just about to land. The parachute system was released, the braking thrusters were fired only briefly and the on-ground systems were activated.

Instead of being on the ground, Schiaparelli was still 3.7 kilometers above the Mars surface. It crashed, but not before delivering what ESA officials say is a wealth of data on entry into the Mars atmosphere, the functioning and release of the heat shield and the deployment of the parachute — all of which went according to plan.

Awaiting a December go-ahead for ExoMars 2020

Schiaparelli was never intended to survive more than a few days on the Mars surface, but the crash-and-die scenario has nonetheless made for bad press in Europe, raising concern that ESA governments might struggle to find the 300 million euros (\$330 million) needed to finish funding a 2020 mission with Russia.

That mission is the second half of the ExoMars program. The first half's main component is the Trace Gas Orbiter, which was successfully placed into Mars orbit and is functioning well. It will begin a series of maneuvers to reach its operational orbit at the end of 2017.

In addition to taking readings from the Mars atmosphere, the orbiter will be used to relay data from the European-built rover vehicle that is the showcase payload for the 2020 mission, to be launched by Russia. Russia is providing a landing package for that mission.

ESA governments are scheduled to meet Dec. 1-2 in Lucerne, Switzerland, to decide on a three- to five-year

spending package covering most of the agency's programs. But ExoMars will be one of the hot topics as not all member states are eager to invest more in it.

Government officials said ESA is in fact missing about 400 million euros but would ask its member states for 300 million and find the remaining funds from within ESA existing budget. It was not clear where those funds would be found.

The Italian Space Agency (ASI), which is ExoMars's lead sponsor at ESA, has said the fate of the Schiaparelli lander has not dimmed its enthusiasm for ExoMars and that it would finance its expected 40 percent of the ExoMars package.

"ExoMars is extremely important for European science and exploration," ASI President Roberto Battiston said in a Nov. 23 statement. "Together with all the participating states in the program, we will work towards the successful completion of the second ExoMars mission."

The Russian space agency, Roscosmos, has also said it sees no reason to scrap the 2020 mission just because of a computer error that tarnished the lander mission's last moments.

A one-second glitch and a 3,700-meter freefall

In its Nov. 23 statement, ESA said the saturation reading from Schiaparelli's inertial measurement unit lasted only a second, but was enough to play havoc with the navigation system.

"[T]he erroneous information generated an estimated altitude that was negative," ESA said. "That is, below ground level. This in turn successively triggered a premature release of the parachute and the back shell, a brief firing of the braking thrusters and finally activation of the on-ground systems as if Schiaparelli had already landed.

"In reality, the vehicle was still at an altitude of around 3.7 kilometers."

ESA said the sequence of events "has been clearly reproduced in computer simulations of the control system's response to the erroneous information."

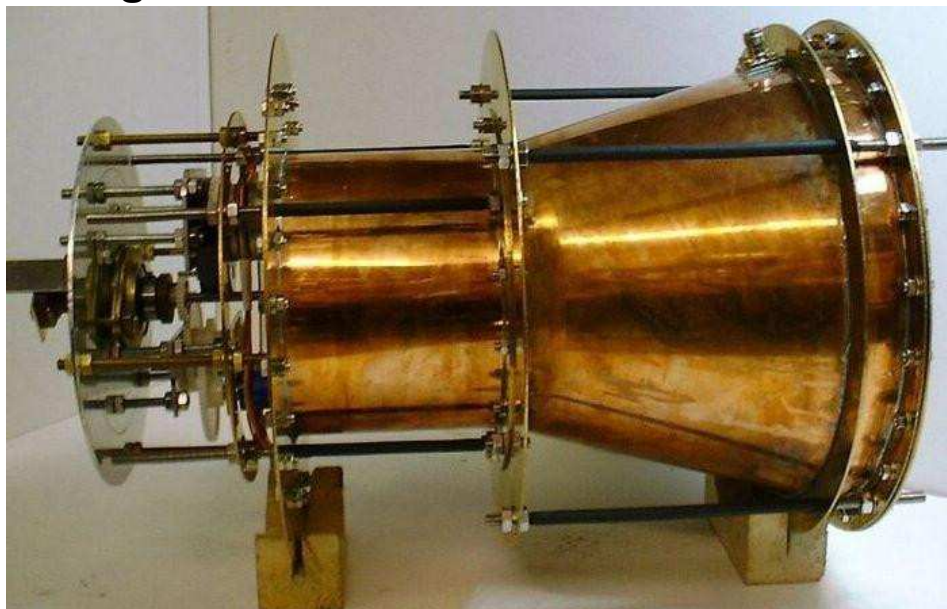
ESA's director of human spaceflight and robotic exploration, David Parker, said in a statement that ExoMars teams are still sifting through the voluminous data harvest from the Schiaparelli mission, and that an external, independent board of inquiry, now being created, would release a final report in early 2017.

More at: <http://spacenews.com/>

THE BACK PAGE

LINKS, COMMENTS AND OBSERVATIONS

NASA demonstrates EM Drive theory, but don't get too excited



The methodology behind a fuel-free 'impossible drive' is solid enough for a peer-reviewed paper.

A fuel-free engine is the stuff of science fiction for now, but scientists at NASA Eagleworks have published a peer-reviewed paper that suggests the ideas behind an EM Drive are worth testing further. Researchers at Eagleworks, a small NASA team tasked with testing humanity's wildest theories of spaceship propulsion, were able to produce thrust without any kind of propellant, in a vacuum, as they published this weekend in ARC.

An EM Drive produces thrust without fuel, instead using microwaves that bounce around a conical, enclosed device. According to the theory, the momentum of those bouncing microwaves is higher at the wide end of the engine, which means the whole system should experience thrust. Eagleworks researchers demonstrated this theory with their recent experiments, generating a force of 1.2 ± 0.1 mN/kW, which is "significantly higher than what you would expect from photon thrust," according to astronomer Scott Manley.

Now that the methodology has passed peer review, the debate over the feasibility of an EM Drive is back in full swing. If humans harnessed this kind of power, it could enable rapid-fire space travel. We're talking trips to Mars in 41 days here. However, this thing is called the "impossible drive" for good reason: It breaks a few laws of physics, including conservation of momentum and Newton's Third Law.

The Eagleworks paper is not proof that the EM Drive is possible. Researchers note that they can't account for all potential sources of error and there's still no explanation for the thrust they observed. A peer-reviewed paper is, if nothing else, a flicker of hope and a call for more experimentation.

Read More at: <https://www.engadget.com/>

This has been reported previously, perhaps sceptically, in NZ. Please read it and, if you like, send us your opinion of this "breakthrough".

Observatory

When visiting the VAS observatory, for your own safety, please bring a torch. Also, please make sure you close and lock the car park gate if you are the last to leave - if you need the combination to the lock, please contact a member of the committee.

Articles Needed

New Zenith needs letters, articles, reviews or pictures related to astronomy. Contributions to the Editor at the email or postal address on the front page.

"Life is tough, but it's tougher if you're stupid"

John Wayne

"Men are born ignorant, not stupid. They are made stupid by education"

Bertrand Russell

"Stupid people are ruining America"

Herman Cain

"It is impossible to travel faster than the speed of light, and certainly not desirable, as one's hat keeps blowing off"

Woody Allen

You!! Out Of The Pool!

Gene Police