

General Data Protection Regulation

Unfortunately there are still some members who have not completed the GDPR form included in the last few NZ newsletters.

To ensure you receive future copies and information please complete the form now.

Please return it to the Membership Secretary or drop it in to the observatory.

Monthly Meeting Changes

Please read the Meeting Calendar on Page 2 of this edition as there have been a few changes.



The 2018 festival takes place over the weekend of 18th & 19th August and, as usual, VAS will have a tent/stand at the show between 10am and 6pm each day.

The weekend can be conveniently divided into 4 sessions (morning and afternoon on each day) and we would like to have 2 or 3 members available for each session.

If you can help over the weekend, please contact Richard Flux for further details.

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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Dennett Road
Bembridge
Isle of Wight PO35 5XF

Tel: **01983 872875** or email: editor@wightastronomy.org

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	Members (19.30hrs) and Public (20.00hrs). Informal meeting and observing

VAS Website: wightastronomy.org

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PLEASE NOTE

Monthly meetings are now held at the Newchurch Pavilion next to the Observatory. All meetings start at 19.30 unless stated.

2018 Monthly Meetings

Date	Subject	Speaker
Check http://www.wightastronomy.org/meetings/ for the latest information		
25 May	The Rise and Fall of the Herstmonceux Observatory	Keith Brakenborough
22 Jun		
27 Jul	The European Extremely Large Telescope	Dr Aprajita Verma
24 Aug	AGM from 19.00hrs Members BBQ	
28 Sep		
26 Oct	Dark Skies Stargazing Night	VAS/AONB
23 Nov	Noise Effects in Astronomical Processes	Dudley Johnson

Observatory Visits Booked

No current bookings.

BUT

There may be ongoing maintenance, painting and cleaning.

Please phone me for the current situation (number on the front page)

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

VAS Contacts 2017/18

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

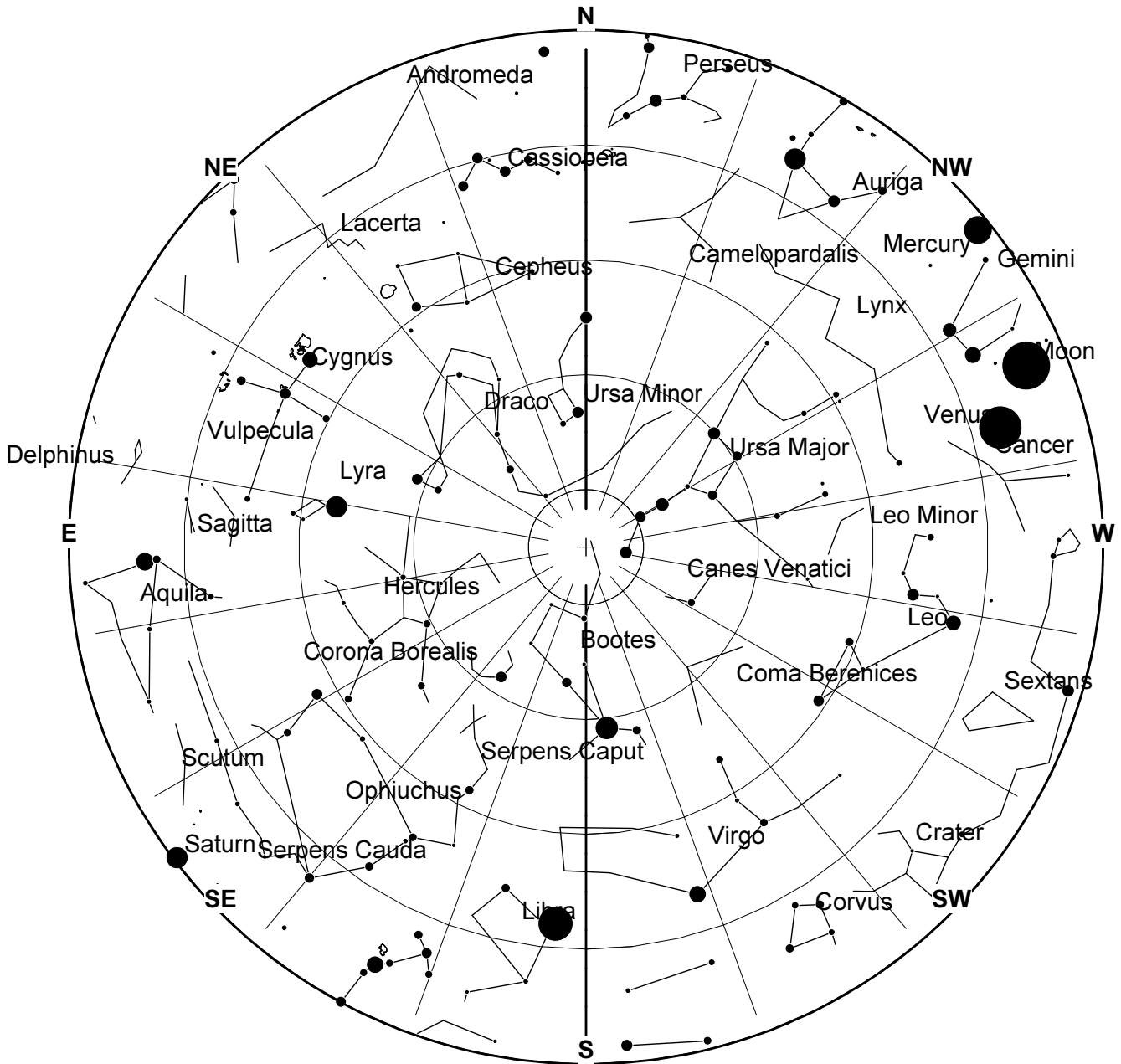
Important

Members using the observatory **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 **TURNT OFF**.

June 2018 Sky Map



View from Newchurch Isle of Wight UK - 2200hrs - 15 June 2018



M13 is about 145 light-years in diameter, and it is composed of several hundred thousand stars, the brightest of which is a red giant, the variable star V11, with an apparent visual magnitude of 11.95. M13 is 22,200 light-years away from Earth.

The Arecibo message of 1974, which contained encoded information about the human race, DNA, atomic numbers, Earth's position and other information, was beamed from the Arecibo Observatory radio telescope towards M13 as an experiment in contacting potential extraterrestrial civilizations in the cluster. While the cluster will move through space during the transit time, the proper motion is small enough that the cluster will only move 24 light years, only a fraction of the diameter of the cluster. Thus, the message will still arrive near the center of the cluster





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It uses material from the Simple Wikipedia article "".

June 2018 Night Sky

Summer Solstice

The summer solstice, the point at which the Sun reaches its most northerly point is on June 21 at 11:07UT, from that point on it starts to head back to the south and the days start to shorten again.

Moon Phases

New	First Qtr	Full	Last Qtr
			
13th	20th	28th	6th

Planets

Mercury

From mid month Mercury makes an unspectacular evening apparition. It can be seen low in the northwest just after sunset, see the table for altitude and azimuth values at 21:30BST

Altitude and Azimuth of Mercury at 21:30 June 2018					
Date	Az	Alt	Date	Az	Alt
14	304°	5°	24	295°	9°
16	302°	6°	26	294°	9°
18	300°	7°	28	292°	10°
20	298°	8°	30	291°	10°
22	297°	9°			

Venus

Venus continues this year's apparition as the Evening Star. Look for it in the west after sunset. As midsummer passes and autumn approaches the angle ecliptic makes with the western horizon at sunset decreases causing Venus become lower in the early evening sky making it increasingly more difficult to observe. We don't have to worry too much about this for a month or so yet.

Mars

This month Mars completes its move eastward and by the end of the month is stationary against the stars before over the next few months starting to race westward into the evening sky. It rises at about midnight and can be observed until daybreak, maybe after if the seeing is good and the sky is clear.

Jupiter

Jupiter is now past opposition, but is still fairly well placed for observation in the southern sky from the onset of darkness until the early hours when the planet sets.

Saturn

Saturn is approaching opposition; it rises at about 11pm and can be observed low in the south from about 1am. The rings are not fully open, but still put on an impressive show. If seeing is good it may be possible to see the shadow of the rings against the planet.

Uranus & Neptune

Both outer planets can be considered unsuitable for observation this month.

Neptune is potentially visible, but the sky even at its darkest is still rather too bright making it a challenge to find the 8th magnitude planet.

Deep Sky

M13 The Hercules Cluster **RA 16h 42' Dec 36° 26' mag 5.8**

On a dark night the Hercules globular can be seen with the naked eye as a fuzzy star part way down the right hand side of the keystone asterism. This is the brightest and many would argue the best globular visible from the northern hemisphere. It lies some 25,000 light years away from us, relatively close by globular cluster standards. As with all globular clusters the view improves with increasing aperture used to observe it. The view is of a sugar coated ball frozen in time, and surrounded by a flurry of sugar grains.

M80 Globular Cluster **RA 16h 17m Dec -22° 59' mag 8.5**

In contrast to M4 this cluster is a much smaller with a very condensed core. In 1880 a nova was observed here, one of only two novae ever seen in a globular cluster.

M92 Globular Cluster **RA 17h 17' Dec 32° 7' mag 6.5**

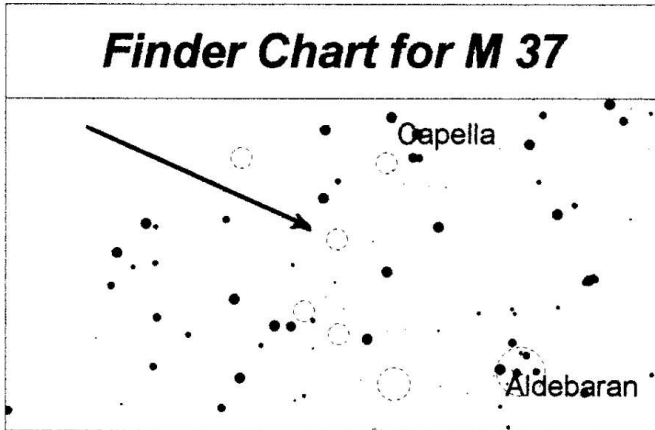
Hercules has two magnificent globular clusters, if it were not for M13 this would be the northern hemisphere's showpiece globular. It is overshadowed by its more famous companion. M92 has a slightly smaller, more condensed core surrounded by fewer halo stars, but should be a stop on anyone's tour of the night sky.

Peter Burgess

My 100 Best Night Sky Sights

Galactic Cluster

Coordinates RA: 05h 52m 24s, Dec: +32' 33"



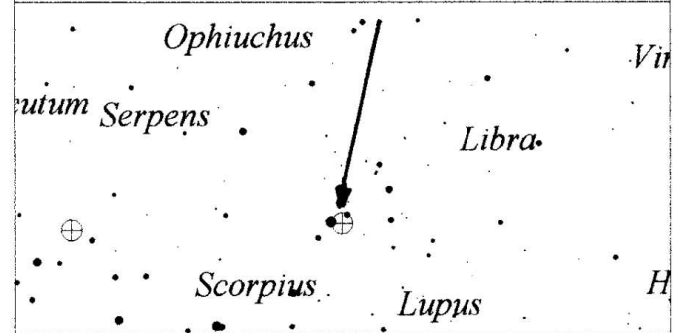
The constellation of Auriga contains no fewer than six open clusters, three of which can be seen easily through binoculars as faint, fuzzy patches of grey light. One of these, M37 is the largest and most densely populated of them all. It lies in the south of the constellation, outside the irregular polygon of bright stars which, with the brilliant yellow Capella at its head, form the most identifiable part of Auriga. Any telescope over 3" will give great views, the smallest resolving the outermost stars with the central area appearing as a bright haze. As aperture increases so does the spectacle - a 6" transforms the central area into a sprinkling of 'star dust' and an 8" reveals the complete cluster in all its glory. Countless stars huddle around the brightest member, a brilliant orange-red star dead centre, and myriad more extend in all directions but chiefly to the north and west. When first observing this lovely cluster use a low power (about 50 or 60x) to see it in its entirety as it covers a large area - about 40'. Then increase magnification to 100x or so and marvel at the brilliant-star-studded central region with its gleaming red eye - you won't forget M37 but, for a short while at least, the beauty of the scene will make you oblivious to the mid-winter chill.

Globular Cluster

Coordinates RA: 16h 23m 24s, Dec: -26' 32"

If your visible sky to the south doesn't extend to within 13° of the horizon move on to the Galaxy which follows. If you can see this far down you're in for a treat as we're now approaching the cream of the Globular Clusters in my list. Easy to locate as it's less than 1½° West of the brilliant red Antares in Scorpius is the magnificent globular M4, one of the closest to us - and it shows. Whereas most are shy, requiring moderate sized telescopes and fairly high powers to start revealing their constituent stars, M4

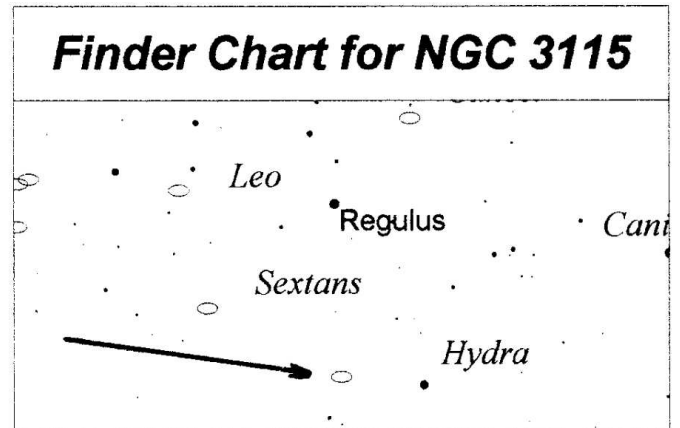
Finder Chart for M 4



unashamedly displays its true nature to the most modest apertures. Find it in your binoculars and you'll see a fuzz ball, but use even a 3" telescope and the outer edge becomes a scattering of minute individual points of light. Change to a 6" aperture and the cluster is resolved into stars right across the face. In my 10" at 100x, not only is the whole globular incandescent with stars, there's also the suggestion of a grainy globe behind the multitude and the peripheral stars give the appearance of being ejected from their parent as if by an explosion - a glorious sight which keeps me riveted to the eyepiece for long periods. You need to observe M4 at around 22.00 - 23.00 GMT in July as, due to its low elevation, it soon moves away from its high point into the less clean skies closer to the horizon.

Lenticular Galaxy

Coordinates RA: 10h 05m 12s, Dec: -07' 43"

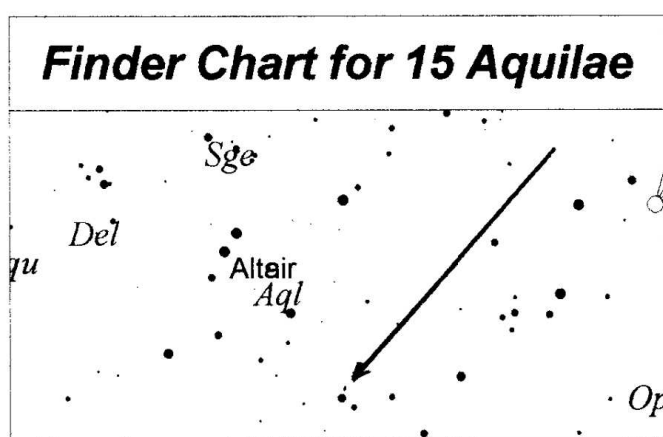


A diminutive constellation bordering magnificent Leo at its SW corner, poor little Sextans has very little to offer the amateur astronomer but it is home to a neat lenticular galaxy, NGC3115. Most spiral galaxies are rather dim affairs visually, needing large telescopes to see at all well but those edge-on to our line of sight are somewhat easier targets other things being equal (size, distance, etc.), because the light is concentrated in much smaller areas than its face-on brethren. NGC3115 at mag10 and only 4' x 1' in size is fairly easy to spot - much easier, for example,

than the face-on spiral galaxy M96 next door in Leo which has the same quoted brightness but spreads over 6 x 4 arc minutes - six times the area. So next time you're in the lion's den (open to visitors from February to April) take a peek under his chest at this little chap. Any telescope from 6" upwards will show the greyish-white, thin cigar-shape with its very much brighter centre. It can take moderately high magnification but this serves little purpose as there's no detail to be seen and it's at its best at modest powers of between 70x and 100x. I find such apparently linear objects in the night sky quite bizarre - straight lines should have no place in this universe of globes and curved space.

Double Star

Coordinates RA: 18h 05m 00s, Dec: -04° 02"



As the eye isn't very efficient at seeing colour in dim objects those who seek more than white or grey in the night sky are for the most part relegated to stars for their satisfaction. Fortunately many fine examples are available, one of the prettier being the attractive double star 15 Aquilae. Train any telescope on this pair mid summer to early autumn and you'll be delighted with the contrast between the very bright yellow primary and its less vivid, but still bright, blue companion (some see this as purple). The two are well separated by 38" so the brilliance of the main star (mag 5.5) doesn't saturate the secondary (mag 7.2). Any magnification can be used but I prefer low powers which, on this pair, seem to accentuate the colours and also introduce other neighbouring stars into the field of view, adding to the scenic beauty - but feel free to experiment. Aquila isn't the easiest constellation to find so locate it on a general star map, identify its brightest star, Altair then refer to the finder chart printed here. As a further aid, the two tiny but distinctive constellations, Delphinus the Dolphin and Sagitta the Arrow can be seen top left on the finder chart. Good hunting.

Bert Paice

Originally published in NZ - December 1998



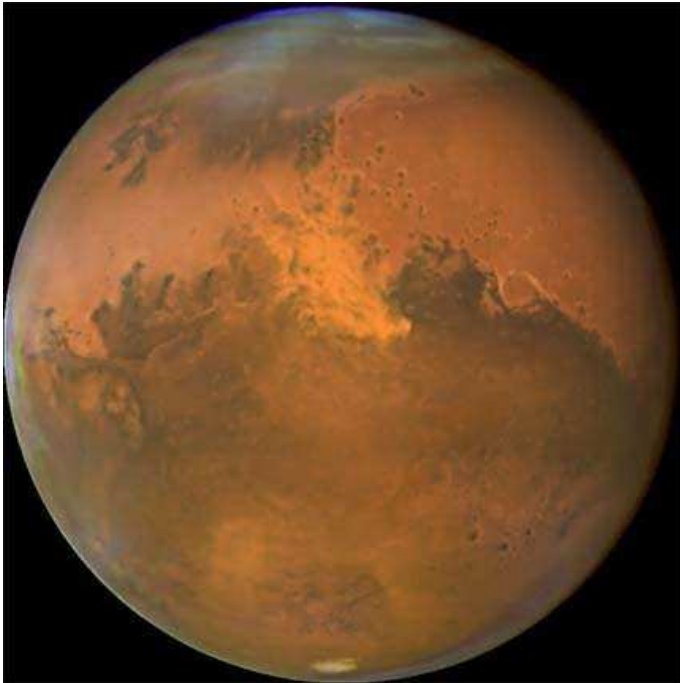
The largest and deepest body of water known to us has never been sailed upon; it has no islands or shores, no wind-churned waves, no sunlight-silvered surface. This dark ocean can't be found on any map of Earth – it's more than 300 million miles away, on Europa, one of at least 69 moons that orbit Jupiter. Data from the Galileo spacecraft, which flew past Europa 11 times between 1995 and 2003, revealed that an immense salty sea lies beneath this moon's smooth icy surface. Estimated to be 60 miles deep – about eight times the maximum depth of the Pacific – it has two to three times as much water as all of Earth's oceans combined.

And Europa isn't some singularly soggy outlier. At least two additional Jovian moons – Ganymede and Callisto – have subsurface oceans. Titan and Mimas, which orbit Saturn, probably do, too. And there's no doubt that another Saturnian moon, Enceladus, harbours water beneath its frozen crust, probably a volume comparable to the Great Lakes. Astonishing and irrefutable evidence for Enceladus's briny deep came in 2005 when the Cassini space probe captured images of geysers spouting ice and water vapour hundreds of miles into space. Cassini even flew right through the geysers in October 2015, skimming within 30 miles of the moon's surface to sample their contents.

To say that the abundance and ubiquity of liquid water in the outer solar system completely upended scientists' expectations doesn't do justice to the discoveries. Before the revelations provided by Cassini, Galileo and other probes, the consensus was stark: the moons around Jupiter and Saturn would look much like our own or those of Mars – rocky, crater-pocked wastelands utterly hostile to life. 'Nobody expected that there were subsurface oceans,' says Seth Shostak, an astronomer with the SETI Institute in Mountain View, California. 'It extends our concept of habitability and where you might find life to worlds that we hadn't considered before. We always assumed that it had to be on a planet. I reckon there are seven other places in our solar system where we have reason to think there might be life – at least the conditions for life. Seven! And most of them are moons!'

More at: <https://aeon.co/>

Study explains why Mars growth stunted



A University of Oklahoma astrophysics team explains why the growth of Mars was stunted by an orbital instability among the outer solar system's giant planets in a new study on the evolution of the young solar system. The OU study builds on the widely-accepted Nice Model, which invokes a planetary instability to explain many peculiar observed aspects of the outer solar system. An OU model used computer simulations to show how planet accretion (growth) is halted by the outer solar system instability. Without it, Mars possibly could have become a larger, habitable planet like Earth.

“This study offers a simple and more elegant solution for why Mars is small, barren and uninhabitable,” said Matthew S. Clement, OU graduate student in the Homer L. Dodge Department of Physics and Astronomy, OU College of Arts and Sciences. “The particular dynamics of the instability between the giant planets kept Mars from growing to an Earth-mass planet.”

Clement and Nathan A. Kaib, OU astrophysics professor, worked with Sean N. Raymond, the University of Bordeaux, France, and Kevin J. Walsh, Southwest Research Institute, to investigate the effect of the Nice Model instability on the process of terrestrial planetary formation. The research team used computing resources provided by the OU Supercomputing Center for Education and Research and the Blue Waters sustained peta-scale computing project to perform 800 computer simulations of this scenario.

The goal of this study was to investigate simulated systems that produced Earth-like planets with Mars

analogs as well. Recent geological data from Mars and Earth indicates that Mars' formation period was about 10 times shorter than Earth's, which has led to the idea that Mars was left behind as a 'stranded planetary embryo' during the formation of the Sun's inner planets. The early planet instability modelled in this study provides a natural explanation for how Mars emerged from the process of planet formation as a 'stranded embryo.'

The success of the terrestrial planetary formation simulations for this study were found to be tied to the detailed evolution of the solar system's two giant planets — Jupiter and Saturn. Systems in the study where Jupiter and Saturn's post-instability orbits were most similar to their actual current orbits also produced systems of terrestrial planets that resembled the current solar system.

More at: <https://phys.org/>

Statically Charged Lunar Dust Is Very, Very Bad for Your Lungs

Nobody said living in space was going to be easy. Beyond the actual difficulty of getting there, day-to-day living won't be a moonwalk in the park either. Even with oxygen habitats to breathe in, a new study finds, lunar dust could quickly infiltrate human lungs, leading to a host of health problems.

Prolonged exposure to lunar dust could impair airway and lung function and make diseases like bronchitis commonplace in a moon community, says the new study published in *GeoHealth* by Stony Brook University in New York. The dust could also induce inflammation in the lungs, increasing the risk of cancer.

Lunar dirt isn't like Earth dirt. Crucially, the Earth has a protective atmosphere, while the moon does not. The lunar soil is frequently and reliably beset by charged particles from the upper layers of the sun, known as solar wind. Once they hit the moon, the solar particles make the lunar soil electrostatically charged, similar to the static cling created by rubbing a balloon on someone's hair.

Scientists have known about lunar dirt's unusual properties for decades. During the Apollo 11 crewed landing, the astronauts noted that “particles covered everything and a stain remained even after our best attempts to brush it off.” The dust maintained a “distinct pungent odour like gunpowder noted when helmet removed.” While the Apollo astronauts suffered no serious ailments from the lunar dirt, that could be due to the fact that their time on the lunar surface was so brief.

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

THE BACK PAGE

LINKS, COMMENTS AND OBSERVATIONS

What if the Moon Suddenly Disappeared?



The moon is more than just a pretty face to gaze upon at night. It helps direct our ocean currents and tides, the movement of Earth's atmosphere and climate, and even the tilt of our planet's axis.

So what would happen to Earth, and us, if it promptly disappeared without notice? Would we survive it? Sadly, probably not.

Right away, we would notice that "nighttime" would be significantly darker. The moon's surface reflects the sun's light, brightening our night sky. Without that indirect glow, any areas that don't have access to artificial light, like country roads or wooded campsites, would become far riskier to travel through at night.

The moon's sudden absence would also confuse animals. In a 2013 review in the *Journal of Animal Ecology*, researchers found animals that use vision as their primary mode of interacting with the world benefit (survival-wise) from the moon's presence. That's no big surprise, but it does have interesting implications for the question at hand. Many predators, like owls and lions, rely on the cover of darkness with just a bit of moonlight to hunt effectively. With no moon, they would have trouble finding food. Rodents, on the other hand, tend to hide more when the moonlight is strong. It's easier for their predators to detect them. With no moon, they would thrive. "I think you'd see some shifts in which species are common and which species are rare in a system," says the study's lead author Laura Prugh, a wildlife ecologist at the University of Washington.

The next immediate difference would be the tides. Because the moon is so close to us, the pull of its gravity impacts our planet. That force is strong enough to pull our oceans back and forth, what we call "the tides." Without the moon, tides would rise and fall at a much slower rate, about one third of their current fluctuation, says Matt Siegler, a research scientist at the NASA Jet Propulsion Laboratory, who works on the Lunar Reconnaissance Orbiter. The tides wouldn't completely stop moving as the sun also has some gravitational pull on the oceans, too, but not nearly as much as the moon.

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

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

NZ needs letters, articles, reviews or pictures related to astronomy. Send to the Editor, contact details on the front page.

"We live in a changing universe, and few things are changing faster than our conception of it"

Timothy Ferris

"The earth is simply too small and fragile a basket for the human race to keep all its eggs in"

Arthur C Clarke

"The universe seems neither benign nor hostile, merely indifferent"

Dr Carl Sagan

"The condition of any backup is unknown until a restore is attempted"

Schrodinger's Backup