

Astronomy Group

2021/22 Session One

COGS

28th September 2021

Welcome to this first physical session!

- **Welcome to our new members**
 - Sue Dackham
 - Andy Grimshaw
 - David Browning (next month)
 - Ralph Brown
 - Peter Blanchfield
- **Admin**
- **Main Talk “The Basics”**
- **Break for tea/coffee**
 - and Constellation of the Month
- **Space & Astronomy News Review**
 - My review of the last month's astronomy and space flight events
- **What's Up for October**
 - Next month's night sky, on-line talks & TV

“Galactic Britain” ????

- **Yesterday Boris Johnson stated that the UK would be the first European nation to launch satellites from somewhere within Europe, “within a year”**
 - Spaceport Cornwall - Virgin Orbit can launch using Rocket1 which is air-launched from underneath a modified Boeing 747
 - Shetland Space Centre, Unst, base for Lockheed Martin
 - Sutherland Spaceport, A' Mhòine peninsular, Orbex
- **UK space industry: £16 B pa, employs 45,000 people**
 - Worldwide space industry expected to double to £500B in decade
- **“The days of the UK space industry idling on the launch pad are over.”**

Inspiration4: First all-private orbital mission

- Billionaire Jared Isaacman funded trip, charity raiser for St.Judes Hospital
- 3 day flight, in higher orbit than ISS, in SpaceX Crew Dragon
- Splashed down 30 miles NE of Cape Canaveral



SpaceX Super Heavy

- Space X temporarily stacked a Starship prototype onto a SuperHeavy booster prototype for a “fit” test (early August)
 - this was the tallest rocket ever at 120 metres
 - they were then decoupled for further engine installations
 - Starship SN20 will have 6 Raptor engines
 - SuperHeavy 4 has been fitted with 29 Raptors
- The first orbital test of the pair will take place Nov/Dec from Starbase on Texas coast, neither vehicle will be recovered.
 - After separation the booster will flip and head back to simulate a vertical landing in the Gulf of Mexico
 - The Starship will continue and descend to simulated landing off Hawaii
 - When operational the Super Heavy booster will be caught by “Mechzilla”, arms on the launch tower (now being attached).



Mars: Perseverance & Ingenuity

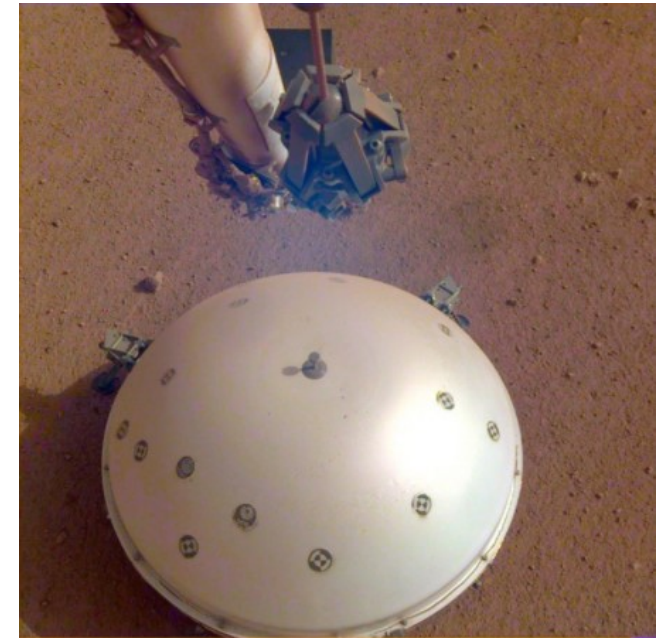
- Perseverance rover has successfully made a 2nd attempt to retrieve a core rock sample drilled out from the Martian surface
- The first attempt failed, mystifying NASA - the retrieval tube was empty after the drill automatically deposited “material” into it
 - It turned out the rock was so fragile it simply crumbled to powder on being drilled
- Ingenuity helicopter has now made a total of 13 flights!
- Its role now is to fly ahead of Perseverance to take stereo images of the ground ahead, helping NASA to plot the best path through to its next destination.
- Perseverance has now flown for a total of almost 25 minutes and about 1.5 miles. It was originally planned to make just 5 test flights



Credit: NASA

InSight detects largest Marsquake

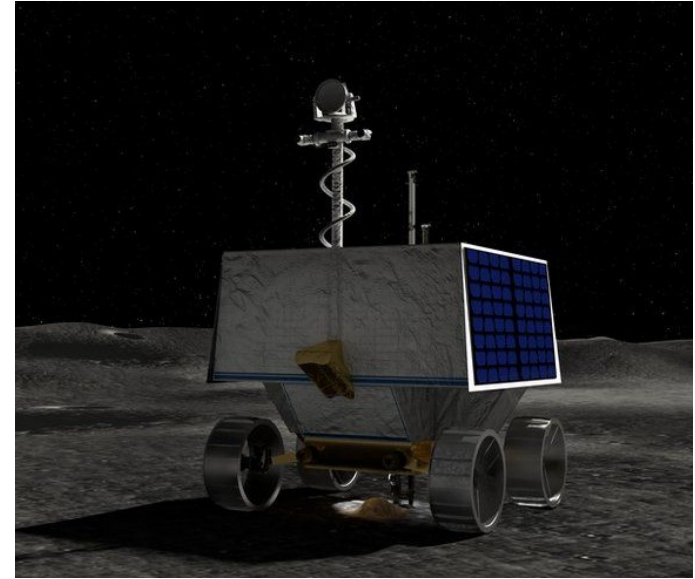
- **NASA's InSight lander has detected three major Marsquakes within a month**
 - One on 18th Sept, was at mag 4.2 and this is five times more powerful than the previous strongest tremor, and lasted for 90 minutes.
 - this happened to be on InSight's 1,000 day (sol) on Mars
- **One of the first two is known to have occurred 5,280 miles away**
 - the previous furthest quake was just 1,000 miles away
- **The latest one's data is being studied but it's thought it could have originated in the Vallis Marineris region, a huge canyon, over 6,000 miles away**
- **By studying data from quakes at different distances researchers can learn more about Mars's internal structure. InSight has already shown us that Mars still has a molten metal core**



Credit: NASA/JPL

NASA's next Moon rover will hunt ice

- **VIPER - (Volatiles Investigating Polar Exploration Rover)**
- **Golf-cart sized, to be launched on SpaceX Falcon Heavy in 2023**
- **Will land on top of privately built lander (Griffin) made by US company Astrobotics**
- **It will land near the edge of Nobile Crater which is almost permanently in shadow, near the Moon's South Pole**
- **It will descend into the crater to look for ice, feeding results data into the Artemis Moon landing programme**



Credit: NASA

Misc Spaceflight News

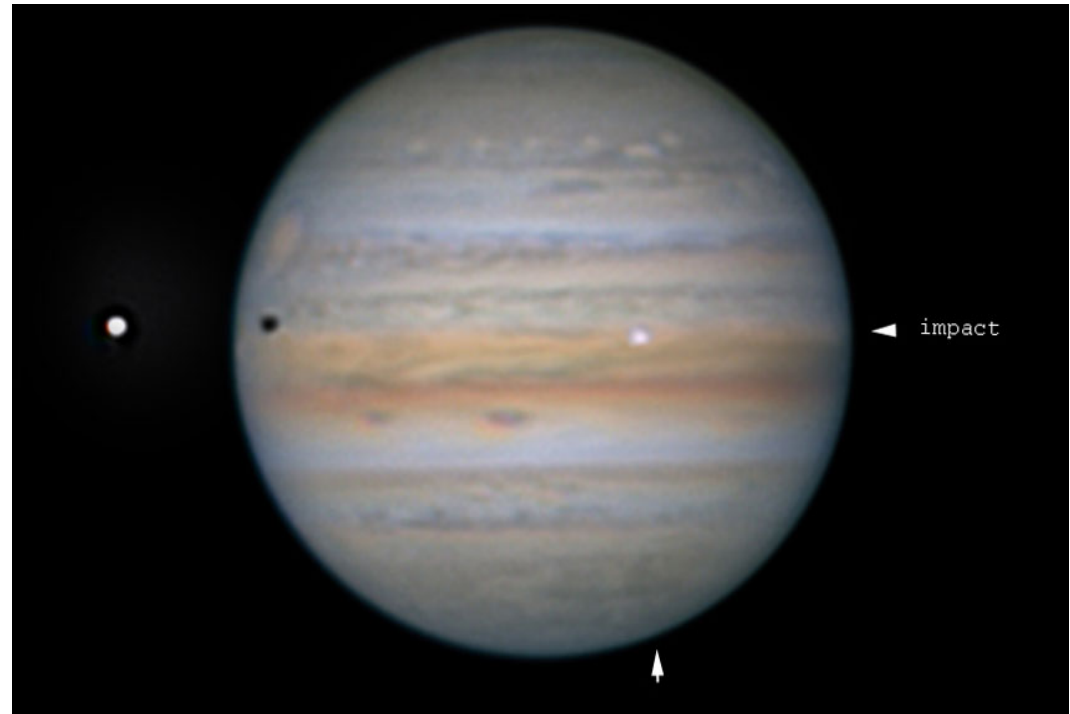
- **Blue Origin's New Shepard's second passenger carrying sub-orbital flight set for Oct 12th**
- **While Inspiration4's "Resilience" was in space that made three SpaceX Dragon's in orbit**
 - Crew Dragon "Endeavour" (Crew-2) and cargo Dragon at ISS
- **Record set in September with 14 humans in orbit at same time: 3x Chinese on Tiangong, 4x on Inspiration4 and 7 on ISS (2x Russia, 1x Japan, 1x France, 3x USA)**
- **The three Chinese astronauts landed back on Earth on 17th Sept, after a 92 day mission, China's longest.**
 - just three days after that a Tianzhou cargo mission launched with supplies for the next crew launching in Oct for 180 day flight.
- **NASA state Boeing's Starliner will not make its unmanned test flight to ISS until next year.**

Misc Spaceflight News

- **Russian actress and a film director will launch to ISS on Oct 5th in a Soyuz, together with two cosmonauts**
 - 12 day flight, making a film about a doctor saving a cosmonaut's life (beating Tom Cruise who will also fly to film aboard ISS)
- **James Webb Space Telescope to launch on 18th Dec**
 - From ESA's launch site at Kourou, French Guiana on Ariane 5
- **Landsat 9 successfully launched yesterday**
 - from Vandenberg AFB, California on Atlas V
 - arguably the most important satellite ever
 - 50 year continuous Earth-study programme
 - looks at city growth, farming spread, changes to coasts, forests, deserts and glaciers.

Amateurs spot Jupiter strike

- On 13th September 3 amateurs (Brazil, Romania, Germany) captured images of an asteroid impacting on Jupiter
- They were all imaging the transit of Io's shadow across the disc and spotted the flash which lasted one second
- It's thought that to make a flash that big, and to last as long as one second, the impactor would have been about 100 metres across



Credit: Harald Paleske

On this day in history

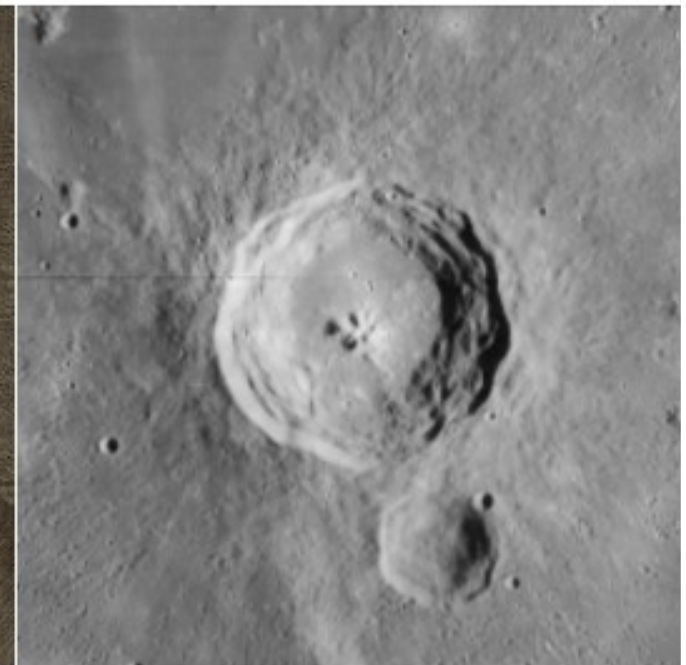


Brian Jones

5h · 🌐



Today is the anniversary of the birth, in Loudun, Vienne on 28 Sep 1605, of the French astronomer and mathematician Ismaël Bullialdus. A foreign associate of the Royal Society, and a friend and correspondent of astronomers Pierre Gassendi and Christiaan Huygens, Bullialdus was a defender of the views and ideas of Copernicus and Galileo. Often regarded as being 'the most noted astronomer of his generation' he wrote several books, the most famous of which is *Astronomia Philolaica*, published in 1645 and in which he supported Johannes Kepler's elliptical planetary orbits. The 61 km diameter lunar crater Bullialdus, located in the western regions of Mare Nubium, is named in his honour.

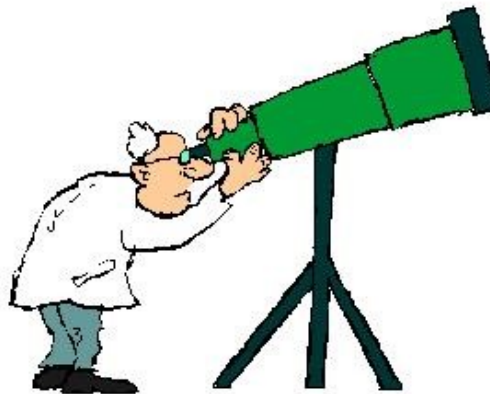


For Sale: Fullerscope 6" Newtonian Reflecting Telescope, on very solid Fullerscope Mark III pillar mount & (also wooden field tripod). 2x EPs, end caps, finder scope, resilvered mirrors, £250.00



What's Up!

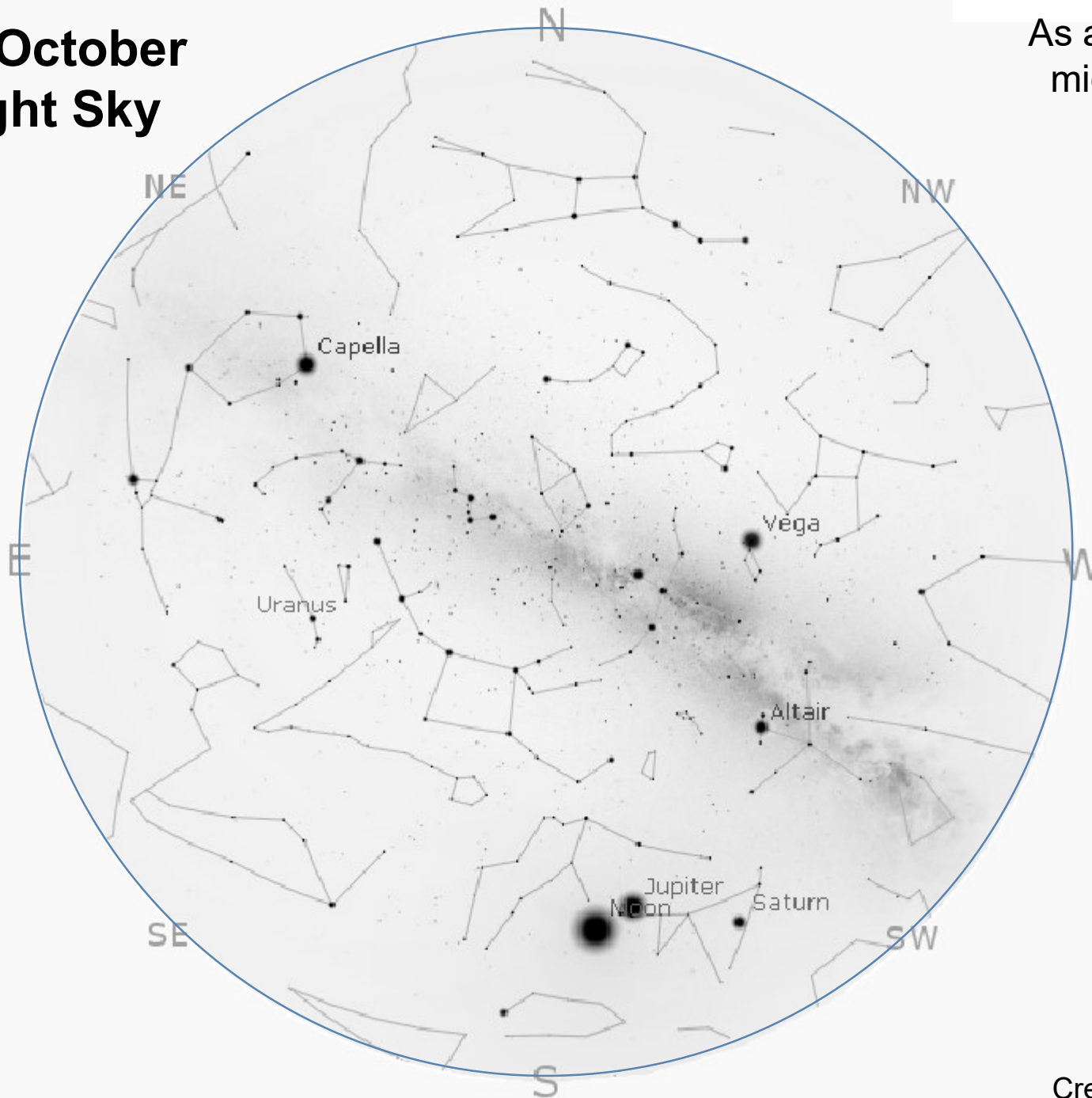
For October 2021



Woking Area U3A
Astronomy Group

The October Night Sky

As at 10 p.m.
mid-month



Credit: Stellarium

Sun & Moon in October

- **New Moon** **6th**
- **First Quarter** **13th**
- **Full Moon** **20th**
- **Third Quarter** **28th**

		Sun	Moon
1 st	Rise	07.03	00.13
	Set	18.39	17.12
15 th	Rise	07.26	16.15
	Set	18.08	02.08*
31 st	Rise	06.53	01.35
	Set	16.37	15.22

1st & 15th times are BST
31st shows GMT

* following
day

The Planets in October

Mercury

Mercury is a morning object from mid-month, low in ESE, best seen about 60 mins before sunrise. Brightens from magnitude +0.9 to -0.5 by month end.

Venus

Venus is a brilliant evening object, shining at mag -4.3 in SSW all month from 60 mins after sunset, low, but improving from middle of month onwards.

Mars

Not visible this month

The Planets in October

Jupiter

A brilliant object at mag -2.6, visible from early evening in the SSE and ideal for observing throughout the month.

Saturn

Saturn too is well placed for observing, slightly lower than Jupiter but only 15° West of it (to the right) in the South, shining at mag +0.5

Uranus

Actually the best placed planet to observe this month, but binoculars must be used to find this mag +5.7 evening object, nicely placed around 50° high in the South

Neptune

Visible all month and almost half way between Jupiter and Uranus in our night sky, but at mag +7.8 a telescope is needed

Astronomical Phenomena in October

4th	A double transit - Jupiter's moons Ganymede and Callisto cast their shadows onto its surface at the same time, from 18.00 to 23.25, but 20.50 optimum to see both (telescope needed)
8th	Peak of the Draconids meteor shower, relatively slow meteors and with a favourable Moon. Low usual rate of only 5 per hour, but this shower can have unexpected flurries.
9th	Thin crescent Moon just 2° from Venus low in SW after sunset
10th	Peak of the Southern Taurid meteor shower, again a low 5 per hour theoretical rate, but with slow bright trails
14th	Moon sits about 5° below Jupiter and Saturn, forming a triangle
21st	Peak of the Orionids meteor shower, the theoretical rate of 20 per hour marred by the near full Moon
29th	In the early hours the Beehive Cluster (aka Praesepe) can be found approx 3° below and to West of 3 rd quarter Moon
31st	End of BST, we revert to GMT (UCT)

World Space Week: 4th-10th October

“High Street Takeover”

Tunsgate, Guildford, Saturday 9th
(organised by local branch of The Institute of Physics)

There'll be local science & space companies involved with demos, talks, music and interactive sessions. There's also a Space-Art competition.

There's a talk in the Odeon Guildford from 5 pm to 7 pm by BBC Sky at Night presenter Chris Lintott together with his co-author Laura Nuttall followed by Q&A

All activities are free of charge and family oriented

World Space Week Guildford 2021

A high street takeover event to celebrate World Space Week, there will be a variety of daytime activities and evening lectures. It's completely free to attend and fun for all the family.



World Space
Week OCTOBER 4-10

When: 9th October 8.30am – 4pm
(evening lecture 5pm-7.30pm)

Where: Tunsgate Quarter Shopping Centre
(evening lecture at the University of Surrey)

Who: There will be something for everyone!

IOP Institute of Physics

Physics Demonstrations



Telescopes & Astronomy



f @IOPSCB
t @IOPSouthCentral
i @iopsouthcentral

Interactive Exhibits



Plus: Live music, a performance from Ensonglopedia, the award ceremony for the Space Art Competition, virtual walk/run/cycle the Solar System challenge, arts and crafts workshops, and more...

World Space Week 2021 Public Lectures



Prof Chris Lintott



Dr Laura Nuttall



**Virtual walk/run/cycle
the Solar System**

Hosted by



www.eventbrite.com (University of Surrey, World Space Week)

www.strava.com/clubs/743372



SPACE ART COMPETITION

SUBMISSION DEADLINE: 4PM, 1ST OCTOBER 2021
AWARD CEREMONY: 2PM, 9TH OCTOBER 2021

WE ARE SEEKING ARTWORK ON ANYTHING RELATED
TO SPACE IN ANY FORM YOU CHOOSE (E.G. PAINTING,
SCULPTURE, DIGITAL, ETC).

PRIZES WILL BE AWARDED TO TWO CATEGORIES:
KS1-2 AND KS3-4

WE ENCOURAGE ENTRANTS TO ATTEND THE
WORLD SPACE WEEK FESTIVAL ON 9TH OCTOBER
IN GUILDFORD TOWN CENTRE, WITH THE AWARD
CEREMONY AT 2PM IN TUNGATE QUARTER.

YOUR SUBMISSION MUST INCLUDE YOUR NAME, KEY-
STAGE GROUP, EMAIL ADDRESS AND 100 WORDS
DESCRIBING YOUR ENTRY.

DELIVER YOUR ENTRY TO:

TUNGATE QUARTER SHOPPING CENTRE, GUILDFORD. ANY DAY
BETWEEN 2PM AND 4PM.

ON ARRIVAL CONTACT EVA PAPAOIKONOMOU (01483 560800) WHO WILL
COLLECT ENTRIES.

IF YOU CANNOT SUBMIT YOUR ENTRY IN PERSON AND WOULD LIKE TO
SUBMIT DIGITALLY PLEASE CONTACT US USING THE EMAIL BELOW.

*T&C's APPLY. FOR MORE INFORMATION: SOUTHCENTRALBRANCH@PHYSICS.ORG

By entering the Competition, entrants agree to the processing of their personal data for the purpose of administering the Competition and in accordance with current UK data protection legislation, including the Data Protection Act and the EU General Data Protection Regulation.

Celebrate WSW 2021

Women in Space

Register your WSW 2021 Event
WORLDSPACEWEEK.ORG

OCTOBER 4-10, 2021



World Space
Week OCTOBER 4-10



IOP
Institute of Physics

Meetings at Local Societies

- Given the current Covid-19 situation, most physical meetings at our local astronomical societies have been cancelled until further notice, some continue via Zoom for paid-up members, but some are now returning to physical meetings.
- You might like however to see their websites for items of interest:
 - **Guildford AS** <http://www.guildfordas.org/>
 - **Farnham AS** <https://www.farnham-as.co.uk/>
 - **Croydon AS** <http://www.croydonastro.org.uk/>
 - **Ewell AS** <https://ewellastronomy.org/>
 - **Walton AG** <http://www.waltonastrogroupp.co.uk/>

Meetings at Local Societies

- **Ewell AS** *Nonsuch High School for Girls, Cheam*
 - Friday 8th October, 20.00 hrs
 - “Astro Tourism - It’s Alive!”
 - » Nigel Bradbury

Meetings at Local Societies

- **Croydon AS** *Sandison Room, Trinity School*
 - Friday 8th October, 19.30 hrs
 - “The Changing Face Of Amateur Astronomy”
 - » Keith Brackenborough

Free Meetings & Talks On-line

- **British Astronomical Association:** Zoom webinars
 - “*Live Observing*”
 - Wednesday 13th October, 7.00 - 8.30 p.m.
 - Dr David Arditti (Director, BAA Equipment and Techniques)
 - Stag Lane Observatory, Edgeware

<https://www.britastro.org/meetings>

(will also be viewable via BAA's YouTube Channel)

Free Meetings & Talks On-line

- **Society for Popular Astronomy:** (via Zoom)
 - “*Mercury - First Rock From The Sun*”
 - Saturday 30th October, 2.00 - 4.00 p.m.
 - Dr Suzie Imber (Uni of Leicester)
 - *Pop Astro Live with Vicky Video*
 - Weekly on SPA’s FaceBook page at 8.00 - 9.00 p.m.
 - Chat show rather than meeting
 - https://www.popastro.com/main_spa1/meetings-and-events/forthcoming-meetings/
- (will also be viewable via SPA's YouTube Channel)

Free Meetings & Talks On-line

- **British Interplanetary Society:**
 - *“World Space Week: Short Talks”*
 - Saturday 9th October via Zoom
 - 10.30: *From Paisley to Perseus*
 - 12.00: *The Pink Side Of The Moon*
 - 13.15: *Women In Space, Scotland*
 - 14.00: *Space Cluster Development*
 - 15.30: *Space Industry Leadership Panel*
 - *“A Modern Day Space Elevator”*
 - Thursday 21st Oct at 7.00, Hybrid - Lambeth/Zoom
 - 2 members from International Space Elevator Consortium

<https://www.bis-space.com/events//>

Meetings & talks on-line

- You can also pay £3.00 to watch these on-line talks run by **GoSpaceWatch**: (book via Eventbrite)
 - *“The NASA Lucy Mission to the Trojan Asteroids”*
 - Wednesday 6th Oct, 7.30 - 9.30 pm
 - Dr Cathy Olkin, South West Research Institute, USA
 - *“Mission Mars: Mars Analogue Mission Experiences”*
 - Saturday 9th Oct 12.00 -5.00 pm (Free)
 - *“Spaceport America”*
 - Wednesday 20th Oct, 7.30 - 9.30 pm
 - Alice Carruth, PR Co-ordinator, Spaceport America

www.gospacewatch.co.uk/

Astronomy on TV

The Sky at Night

“The Forgotten Solar System”

Jupiter, Saturn, Mars, Venus and Mercury have been explored by numerous spacecraft, but Uranus & Neptune have only been glimpsed once, by Voyager 2. Are the ice giants worthy of further investigation? Maggie and Chris find out what missions to the outer Solar System might discover, and the window of opportunity that could see a spacecraft arrive in 2043.

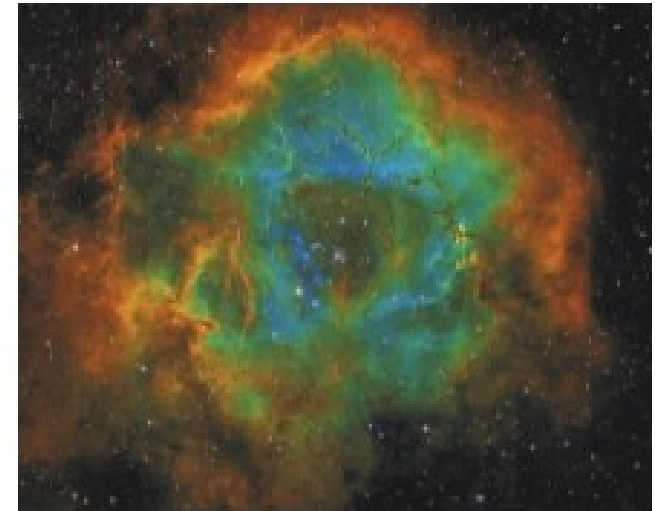
Sunday	10 th	Oct	BBC 4, 10.00 pm
Thursday	14 th	Oct	BBC 4, 7.30 pm



Stars Over Surrey

First Friday of the month 1:20 and 7:20 pm

Repeated the following Monday night at 11.0 pm and available after transmission as a podcast.



Available on DAB+ in some local areas or "Listen live" on-line

Next broadcast: Friday 1st Oct, 1.20, 7.20 pm
next repeat: Monday 4th October, 11 pm



That's all Folks!