

Stars Over Surrey Astronomy & Spaceflight News

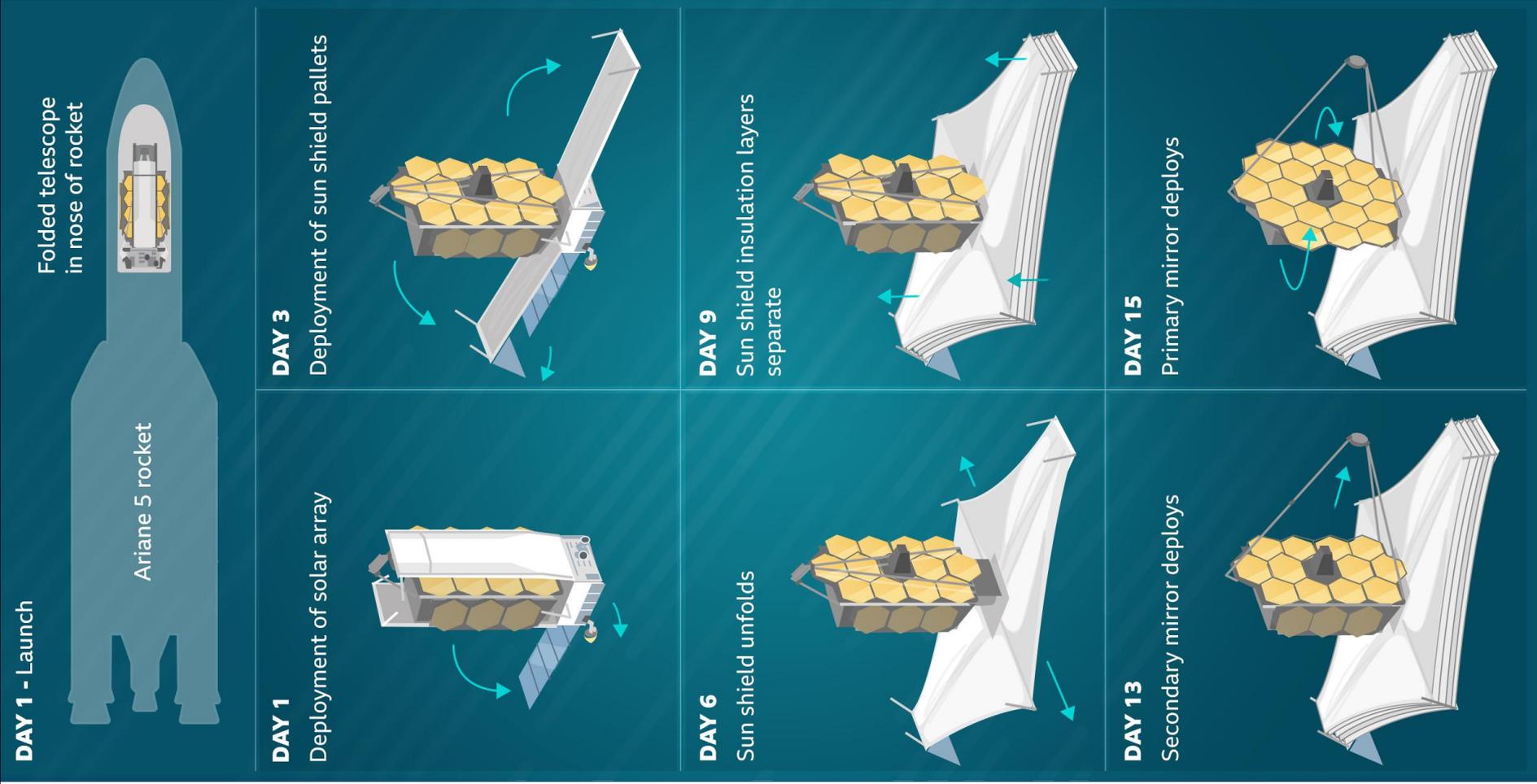
7th January 2022



JWST Mission is Hunky Dory!

- **Following its launch on Xmas Day the James Webb Space Telescope is going well in its set-up phase**
- **Launch by ESA's Ariane 5 was so accurate that it will add years to instrument's life**
- **First the antennae were successfully deployed**
- **The 5 layers of Solar Shield now fully deployed**
 - tennis-court sized sunshield necessary to bring temperature down to ultra cold levels for sensitive IR instruments to work
 - tightening of individual layers performed on Weds 4th Jan
- **The mirror “wings” are to be unfolded this weekend**
- **There are 344 “single point of failures”!**
- **Will take a month to reach Lagrange point L2**
- **Then there'll be a calibration & testing phase and cooling period, “first light” in June**

How the JWST will unfold in Space



Perseverance Finds Oldest Rocks



Credit: NASA JPL-Caltech

- The rover is investigating an area on the floor of Jezero Crater named Séítah, and has drilled into what was thought to be sedimentary rocks.
- The abraded samples have been analysed on board and found to contain olivine crystals surrounded by pyroxene, as in magma.
- This indicates that the rocks were volcanic in origin, presumably from the crater once holding a lake of lava
- Ground penetrating radar shows that the Séítah rocks dive under the nearby Fractured Rough area, and will be the oldest rocks in Jezero
- Samples have been stored in sterile tubes for later caching and return.

Elsewhere on Mars

- **NASA's other Martian Rover, Curiosity, has detected organics compounds on the surface in Gale Crater**
 - not proof of life but an indicator of the possibility, and also a pointer to experiment and instrument design on future missions
- **The rover's "Wet Chemistry Experiment" had been scheduled to run some time ago, but the rover's drill broke, so scientists had to come up with another way of conducting the test**
 - instead of pulverised rock from drilling they used sand that had been collected from dunes, fed that into a chamber in its on-board laboratory where solvents were added, yielding derivatised forms.
- **Benzoic Acid and Ammonia were found, with other compounds indicated**
 - not proof of life but an indicator of the possibility, and also a pointer to design of experiment and instruments on future missions



Red Sunset
on the
Blue Planet

Blue Sunset
on the
Red Planet

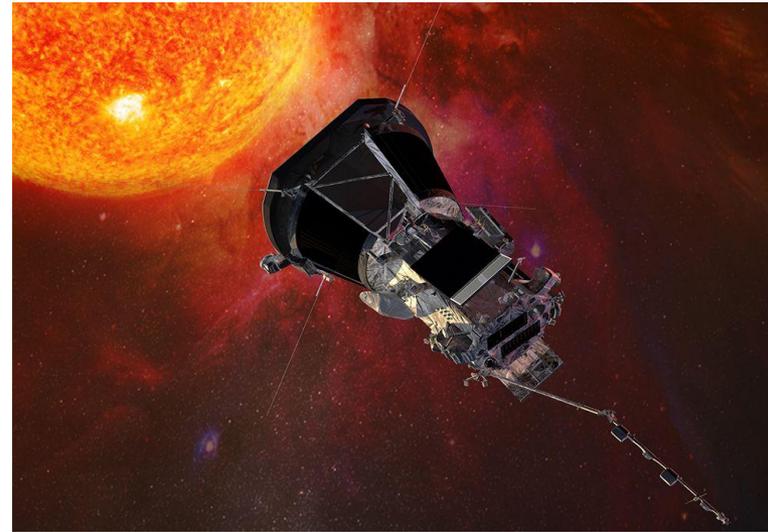
From Earth

From Mars

IG: Astronomy_Eye

Parker Solar Probe “touches” the Sun

- On 15th Dec it was announced that NASA’s Parker Solar Probe had briefly entered the Sun’s Corona for the first time
 - this actually occurred in April but the data took three months to return and then months more to verify
 - the craft actually passed through the boundary three times in the course of five hours, 7 million miles above the Sun’s surface. On later approaches it will reach 4 million miles
 - The probe is travelling at 350,000 mph so it can get in quick, take measurements and get out again quickly. There’s a thick heat-shield that protects it from the 1+ million degrees in the Corona, the instruments working at about 30°
- It’s hoped Parker will help explain the currently unknown mechanism whereby the Corona is so much hotter than the visible surface of the Sun (the Photosphere) at 6,000° C
 - Another mystery to be solved is how the Corona’s charged particles of electrons, protons and heavy ions get accelerated into Solar Wind



Credit: NASA-JHU-APL

Japanese Billionaire Visits ISS

- On 8th Dec a Russian Soyuz piloted by a veteran cosmonaut ferried Yusaka Maezawa and his production assistant to the ISS for 12-day stay, returned on 19th
 - Founder of Zozotown, Japan's largest on-line fashion retailer
- The visit is being filmed by the assistant for his YouTube channel
- This is merely a prelude to his trip around the Moon which should take place in 2022/3 on a Space X Starship
 - he'll invite up to eight "creatives" to fly with him to interpret the flight
- First fare-paying "space tourists" at ISS for over a decade
- Roscosmos earned a lot by ferrying US astronauts to ISS after the Shuttle cancellation. Now they have lost their monopoly because NASA uses Space X and eventually Boeing, so this type of trip, and last month's filming visit recovers some of that lost revenue.

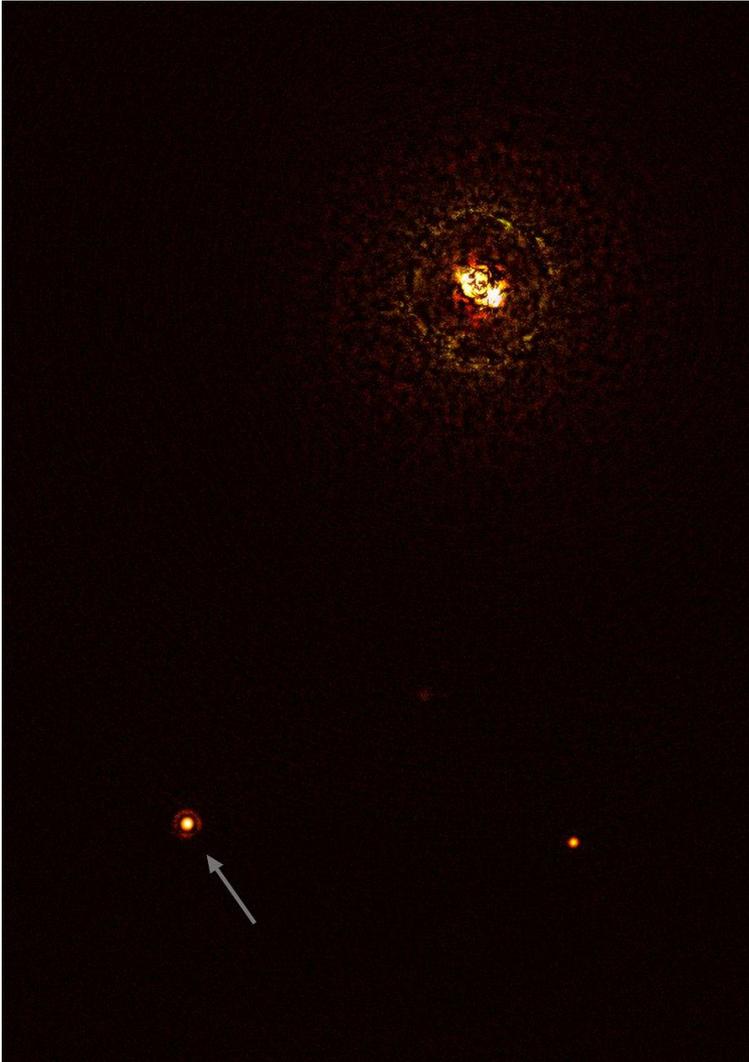


Credit: NASA TV/Spaceflight Now

Miscellaneous Spacflight News

- **Blue Origin's New Shepard sub-orbital rocket has flown again, this time with six passengers**
 - including the eldest daughter of Alan B Shepard
 - they'll still get the FAA's "Commercial Astronaut Wings" which will be discontinued from 2022
- **SpaceX has for the first time launched two Falcon 9 rockets on the same day. One took 52 Starlink satellites into orbit from Vandenberg Air Force Base in California. The other, just 15 hours later, was from Cape Canaveral and carried a Turkish comms satellite into geostationary orbit**
 - the Vandenberg launch also set a record as the 11th time that particular Falcon 9 booster has flown and been recovered.

Massive Exoplanet at b Centauri



Credit: ESO NB Rings are optics artifacts, arrow indicates planet, other object is background star.



Credit: ESO (artist impression)

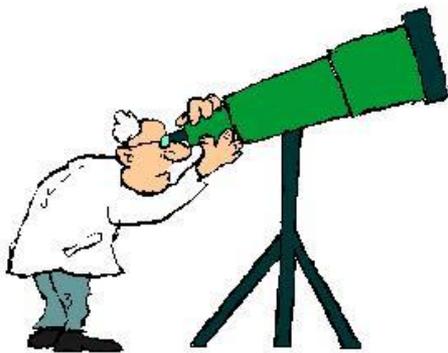
Massive Exoplanet at b Centauri

- **b Centauri is a binary star, 6 times as massive as Sun**
- **Relatively few binary systems have as yet been discovered to have planets, especially one so massive**
- **European Southern Observatory has identified a giant exoplanet (b Centauri (AB) b) orbiting the pair**
 - it's a “super-Jupiter” with mass between 9 - 12x that of Jupiter
 - but orbits 100x further out, at 560 a.u.
- **It's not yet known how such a massive planet could form there. Planets form from the material in the star's gas & dust disk, but that far out the disk material would be too tenuous to form such a massive planet**
 - possibly it formed closer then got ejected
 - possibly there was a hollowing out of the protoplanetary disk
 - possibly gravitational irregularities led to dense clumpings in disk

Stars Over Surrey

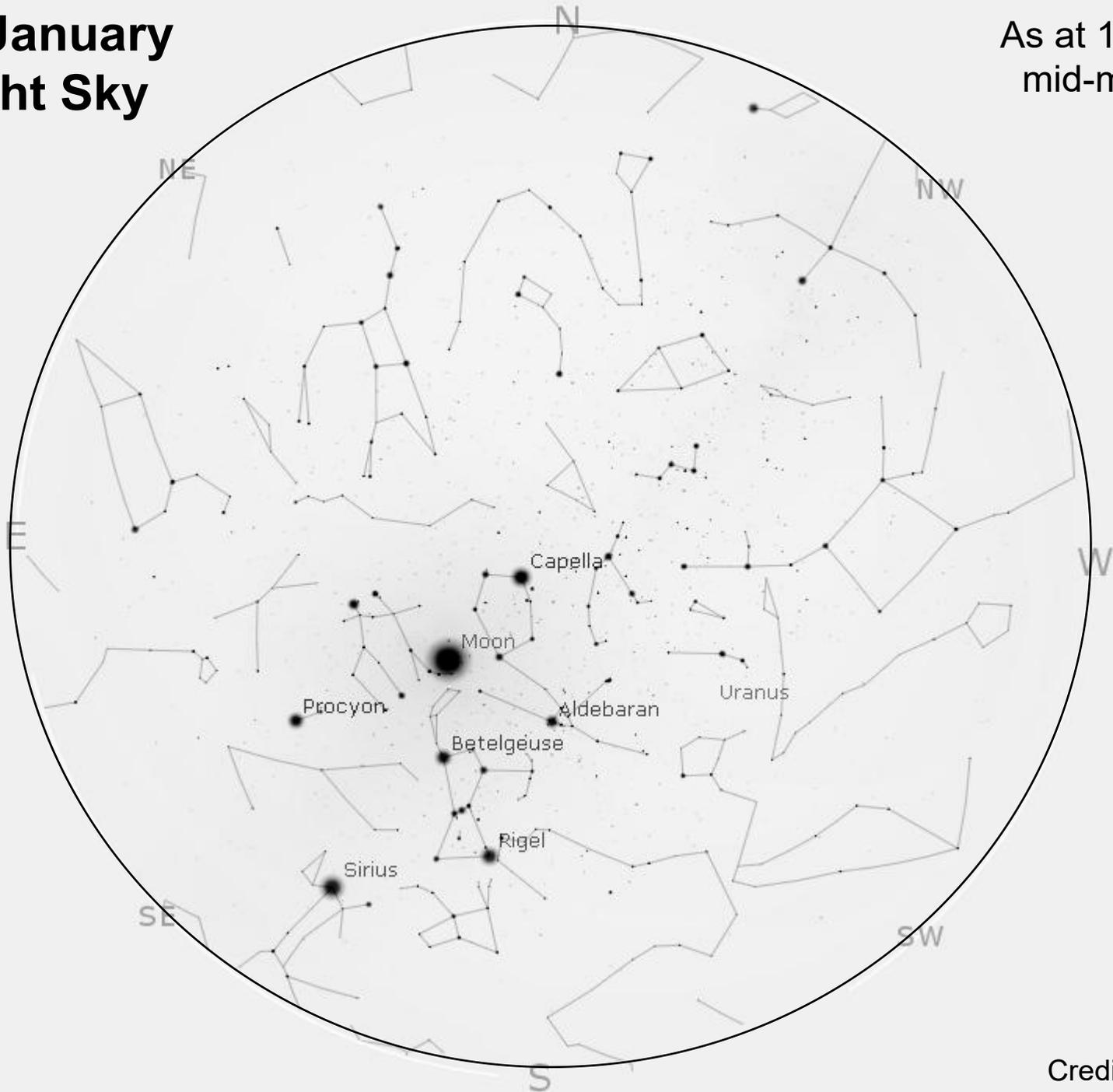
What's Up!

For January 2022



The January Night Sky

As at 10 p.m.
mid-month



Credit: Stellarium

Sun & Moon in January

- **New Moon** **2nd**
- **First Quarter** **9th**
- **Full Moon** **17th**
- **Third Quarter** **25th**

		Sun	Moon
1 st	Rise	08.06	06.55
	Set	16.04	14.26
15 th	Rise	08.00	13.38
	Set	16.23	07.24*
31 st	Rise	07.41	17.49
	Set	16.50	15.32

All times are GMT

* following day

The Planets in January

Mercury

Mercury is still an evening object in the SW, setting just over an hour after the Sun. Best seen in the first two weeks of the month, before it starts to fade.

Venus

For the first few days of the month Venus will be a brilliant but low evening object, setting in SSW shortly after the Sun. By mid month it will have emerged into the morning sky rising about an hour before the Sun. It will be easier to find by month end, higher in SE and rising two hours before sunrise.

Mars

Rising two hours before the Sun at month start Mars remains low and difficult in SE for the whole of January.

The Planets in January

Jupiter

At its best early in the month, very bright in SSW. By month end it will be low in SW as the Sun sets

Saturn

Saturn is only visible in SW for first half of month, but is challenged by the twilight

Uranus

Still well placed for most of the 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 in the SSW, but at mag +7.9 a telescope is needed. Its height deteriorates from 30° above horizon to 15° by month end.

Astronomical Phenomena in January

3rd	The peak of the annual Quatrants meteor shower occurs this evening. The near new Moon will not interfere
4th	The thin crescent Moon, Mercury and Saturn form a tight triangle in the SW just after Sunset.
5th & 6th	Jupiter quite close to the waxing crescent Moon both nights, to its right on 5 th , to its left the following day
14th	Mercury and Saturn are just 4° apart, from 30 mins after sunset.
26th	The waning crescent Moon occults 2 nd magnitude double star Zubenelgenubi (α Librae). α -1 disappears at 05.25, α -2 at 05.34, then α -1 reappears at 06.35, α -2 at 06.43.
29th	Mars can be found approx 4° of the crescent Moon 80 mins before sunrise, low above SE horizon. Venus is a further 10° NE from Mars.

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 14th January, 20.00 hrs
 - *Subject tba*
 - Prof Brad Gibson, Uni of Hull

Meetings at Local Societies

- **Croydon AS** *Sandison Room, Trinity School*
 - Friday 21st January, 19.30 hrs
 - “tba”
 - » tba

Free Meetings & Talks On-line

- **British Astronomical Association:**
 - *“Observing the Satellites of the Giant Planets”*
 - Wednesday 12th January, 7.00 - 8.00 p.m. via Zoom
 - Mike Foulkes, Dir BAA Saturn, Uranus & Neptune Section
 - *“BAA Meeting”*
 - Saturday 22nd 2.30 pm to 5.30 pm
 - Macnamara Suite, London Irish Centre, Camden Square, NW1
 - Observing Variable Nebulae - Grant Privett
 - The Greatest Sunspot Groups - Peter Meadows

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

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

Meetings & Talks On-line

- **Royal Astronomical Society:**
 - *“Exploring Space and Astronomy Through Philately: A Brief Introduction”*
 - Katrina Raynor-Evans FRAS
 - via Zoom
 - Tuesday 18th January, 1.00 pm to 2 pm.00 pm

[www.https://ras.ac.uk/events-and-meetings/External-Meetings](https://ras.ac.uk/events-and-meetings/External-Meetings)



Meetings & Talks On-line

- **British Interplanetary Society:**
 - *“SSTL: Past, Present and to the Moon”*
 - Marc Casson, SSTL December via CrowdCast
 - free to members, otherwise £10.00
 - Wednesday 19th January, 19.00 to 20.30:

<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)
 - *“Seaborne Launch: Optimal Launch Solution for the UK”*
 - Wednesday 26th January, 7.30 - 9.30 pm
 - Paul Williams, Black Arrow Technologies

www.gospacewatch.co.uk

Astronomy on TV

The Sky at Night

“Dark Skies”

Light Pollution can make life very difficult for astronomers. In this episode the team speak to ecology experts, radio astronomers and dark-sky rangers to find out why light pollution is such an issue, whether it's getting worse and what we can do about it. Plus the London-based Baker Street Irregular Astronomers reveal how they observe the night sky from a light polluted area.

Sunday 9th Jan BBC 4, 10.00 pm

Thursday 13th Jan BBC 4, 7.30 pm

