



Woking Area



THE UNIVERSITY OF THE THIRD AGE

# Astronomy Group

2020/21 Session Nine

via Zoom

25<sup>th</sup> May 2021

# Welcome to this zoom session

- **Astro Software and Apps**
- **Break for tea/coffee**
  - and Constellation of the Month
- **Space & Astronomy News**
  - My review of the last month's astronomy and space flight events
- **What's Up for June**
  - Night sky, TV & On-line talks.



# Surrey At The Moon

- **ESA announces plans to establish Moonlight, a GPS & telecomms network around the Moon**
  - has set up a feasibility study to assess viability and enable the business case to be built
- **Concept is that astronauts would know exactly where they are as they travel round or on the Moon and to land with precision**
- **Two consortia have been invited to submit proposals and SSTL heads one of these**
  - the other is headed by Telespazio and includes UK's Inmarsat
- **Three, possibly more, orbiters required plus probably some ground stations to give accuracy within 30 metres**
- **SSTL's Lunar Pathfinder is scheduled to be in Lunar orbit in 2023/4 and could act as the network's first node**
  - highly elliptical orbit to give it loitering time over South Pole where NASA's Artemis plans to land



Credit: ESA

# Ingenuity Mission Extension

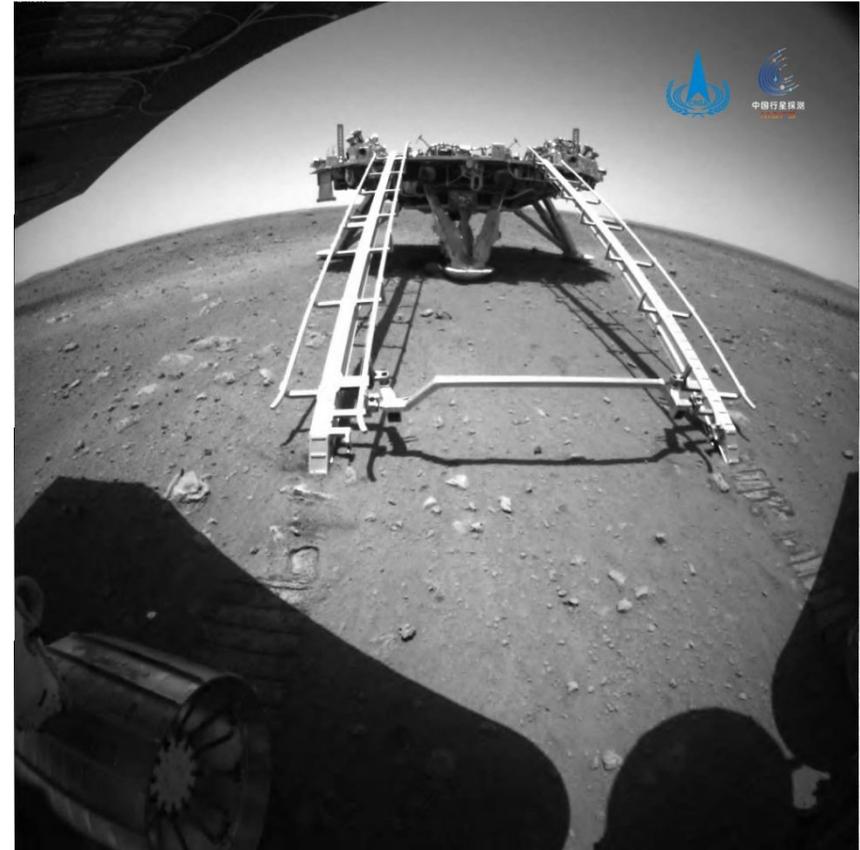
- The initial mission plan for Ingenuity was for five flights as a technology demonstrator in 30 days, which it has now completed
- After its 4th flight NASA announced the flights have gone so well that its mission has been extended for a further 30 days and in an “operations demonstration” mode
- In its 5<sup>th</sup> flight it flew one way to a new ‘airfield’ it selected 129 metres away, rising to a new record height of just over 10 metres
- It’s now preparing for its 6<sup>th</sup> flight. It will fly 150 metres to a site of interest, take colour images to demonstrate that stereo images can prove of survey use, then fly a further 50 metres to a new landing area
  - Perseverance won’t be imaging it as it’s preparing for survey work



Credit: NASA

# China's Mars Lander Touches Down

- **China has become the third country to soft land on Mars following USSR & USA and the second to deploy a rover onto the surface**
- **The lander separated from the Tianwen 1 orbiter on Friday 14th May**
  - combination of aeroshell braking, parachute then retro-rockets
  - Landed in Utopia Planitia
  - Zhurong Rover has now sent back its first pictures
  - At 240 kg Zhurong is a little larger than the NASA rovers Spirit and Opportunity which landed in 2004
  - It has an expected lifetime of about 90 days
  - the orbiter will continue to operate for two years



Credit: CNSA

# China Starts New Space Station

- **Core module Tianhe of new space station has been launched by Long March 5B**

- “Harmony of the Heavens”
- Length 16.6m Diam 4.7m
- Weight 22.5 metric tons
- 11 missions to complete by end 2022, starting with arrival of Tianzhou cargo vessel
- First expected manned mission possibly in June for three month tour
- Final size expected to be similar to Soviet Mir
  - 1/6 that of ISS
- To be permanently manned by crew of three, catering for six on board during changeover



Credit: CNSA

- **World wide condemnation of China allowing giant core stage to re-enter in an uncontrolled manner**

- 30 metres long, 5 metres wide, massing 21.5 metric tons
- eventually came down over Indian Ocean, but reports state some debris may have come down across Arabian peninsular (20-40%)
- NASA accuses China of failing to meet “responsible standards”

# SpaceX News

- **SpaceX completes first Commercial Crew mission by bringing back four astronauts from the ISS with a night time landing of Crew Dragon off the Florida coast**
- **Starship Prototype SN15 sticks successful soft landing**
  - First of new bloc of prototypes incorporating hundreds of improvements gleaned from SNs 8-11
  - Tweet from Musk suggests that they might re-fly the same prototype
- **Space X announce plans for first orbital flight of Starship, launched by Super Heavy 1<sup>st</sup> stage**
  - to test launch, separation and orbital procedures in 90 mins flight
  - neither rocket will be recovered, but will simulate soft landings
    - Super Heavy - off the Florida coast
    - Starship - off Hawaii (possibly by end of this year)
- **One of SpaceX's Falcon 9s reaches 10 launches & recoveries ferrying another batch of 60 Starlinks**
  - incredible launch rate of five Falcon 9s in just three weeks!

# Misc Spaceflight News

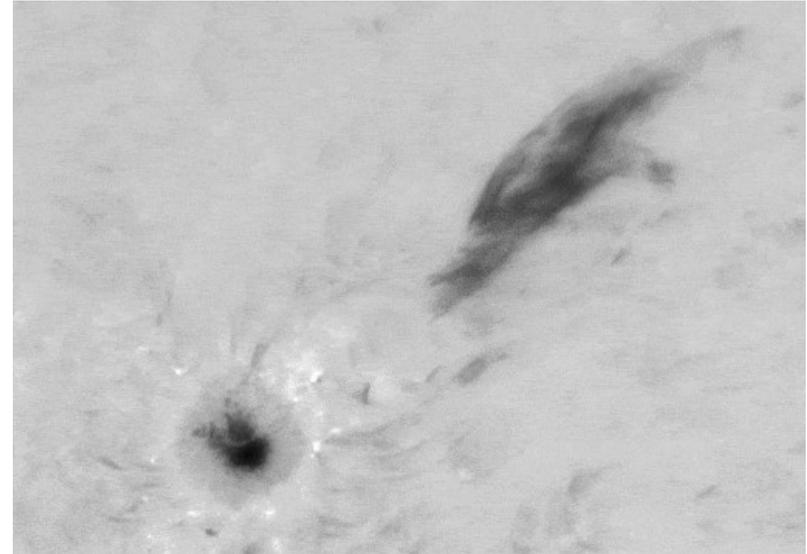
- **July 20<sup>th</sup> set for first passenger carrying sub-orbital flight of Blue Origin's New Shepard rocket**
  - one seat will be filled by winner of on-line auction (currently @ \$2.8M)
  - remainder likely to be Blue Origin personnel (maybe Geoff Bezos?)
- **Richard Branson hints he expects to fly on a sub-orbital hop soon following the first flight of VSS Unity spaceplane from its new Spaceport America operating base in New Mexico**
  - Two further proving flights before passenger flights commence
- **Russian actress and Japanese film-maker to fly on Soyuz to ISS on Oct 5<sup>th</sup> for 12-day film scene mission**
- **Another 12-day mission for two Japanese on Dec 8<sup>th</sup>**
  - knock-on impact is that NASA's Mark Vande Hei will stay on-board for a record breaking 353 days till there's a return seat for him.

# Misc Spaceflight News

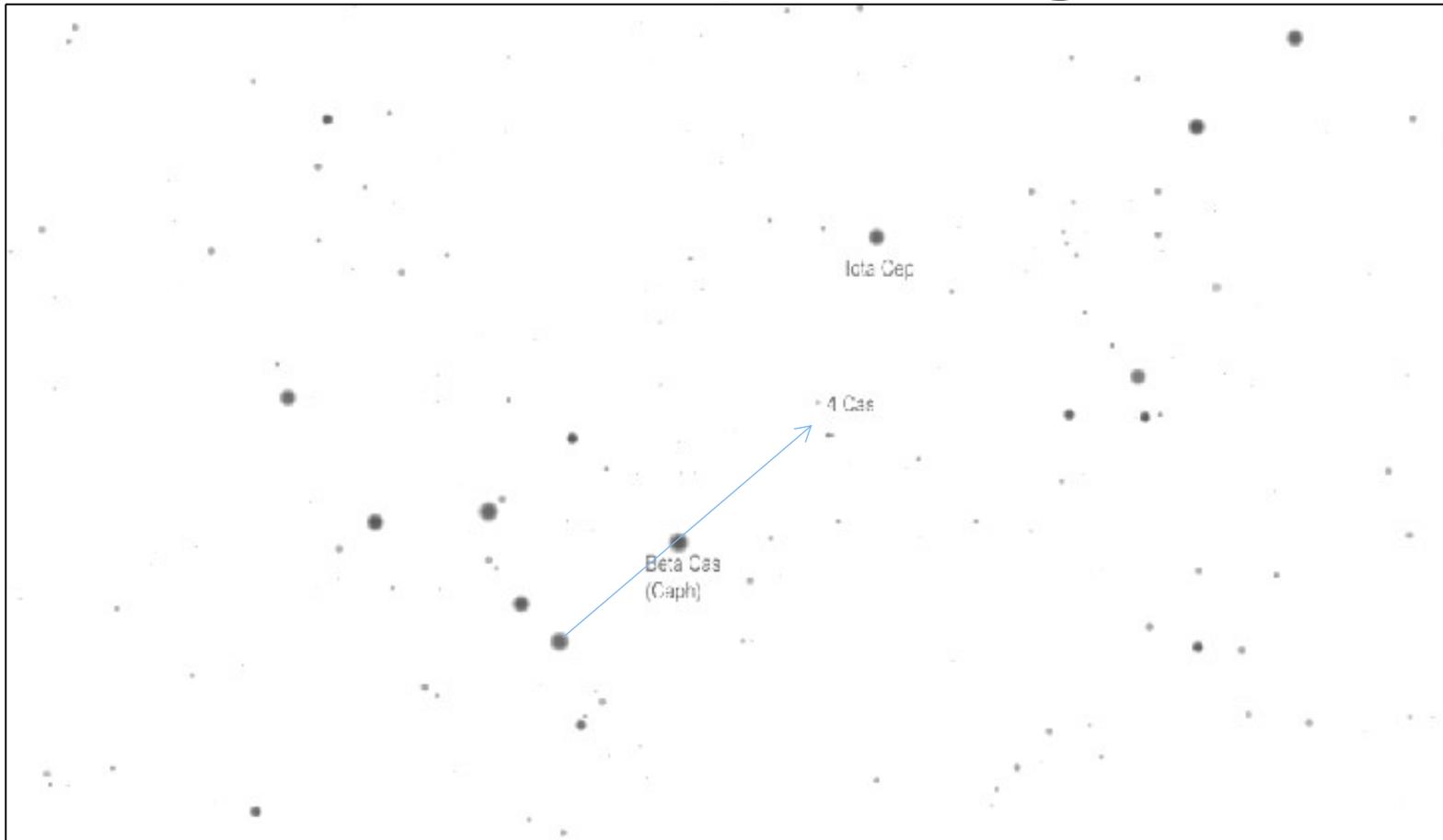
- **We're entering a domain of private astronauts in orbit!**
  - Over the next seven months there'll be 12 private astronauts reaching orbit, the same number of prof'l astronauts sent by USA, ESA, Russia, China
    - Sep: SpaceX flying four in Crew Dragon in LEO charity mission
    - Oct: Roscosmos taking Russian & Japanese to ISS in Soyuz
    - Dec: Roscosmos taking two Japanese to ISS in Soyuz
    - Jan: Axiom Space/SpaceX taking four to ISS in Crew Dragon
- **Osiris-Rex has set off from Asteroid Bennu with its 60 grams of pristine dust**
  - Its 1.4 billion mile journey will take 2½ years, the sample capsule will parachute onto the Utah desert on 23 Sept 2023

# The Sun Seems To Be Waking Up!

- On 22<sup>nd</sup> May a sunspot (AR2824) unleashed 12 solar flares over a 24 hour period
- One of the explosions generated a radio signal so strong that it drowned out the signal being recorded at a radio telescope of a local thunderstorm. Credit: Jozef Cukas
- These ejected matter from the Sun's chromosphere out into space, in events known as Coronal Mass Ejections
  - At least one of these is likely to brush Earth's atmosphere causing aurorae on Wednesday 26<sup>th</sup>.

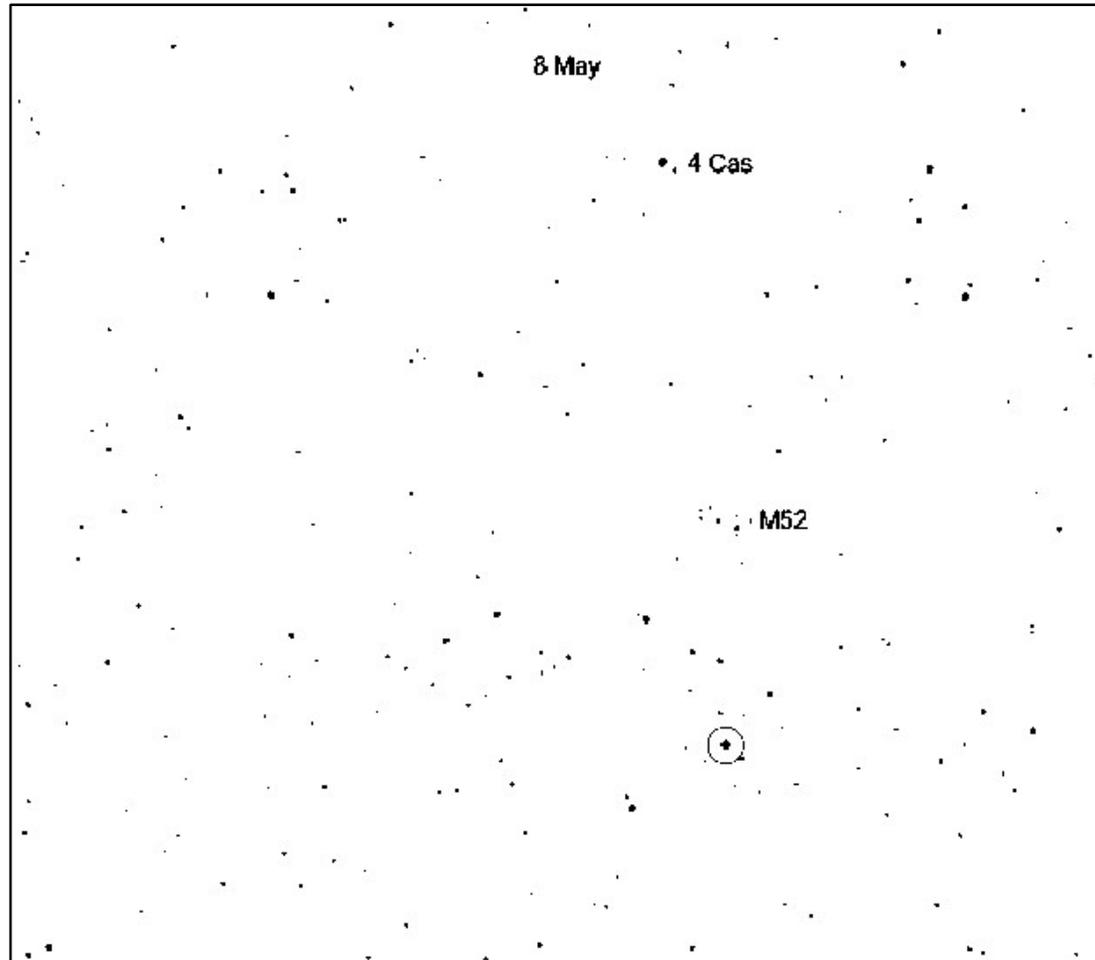


# Nova in Cassiopeia Brightens



- **The Nova in Cassiopeia has brightened by 2 magnitudes during May and is now (in theory) naked-eye visible at Mag +5.3 and can certainly be found in binoculars (at + as above, so project a line through the two ends stars of Cassiopeia to get you roughly there)**

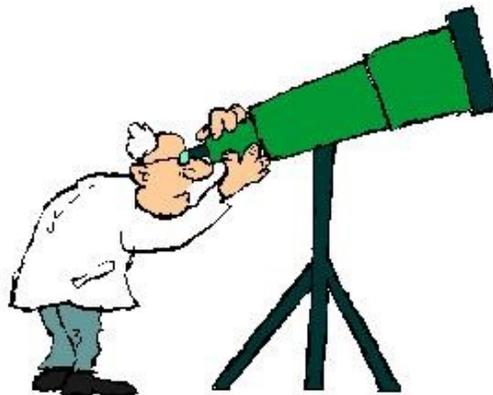
V1405 Cas can be found just 24 arc minute  
(approx one Moon's width) below open cluster M52



Credit: Robin Scagell, SPA

# What's Up!

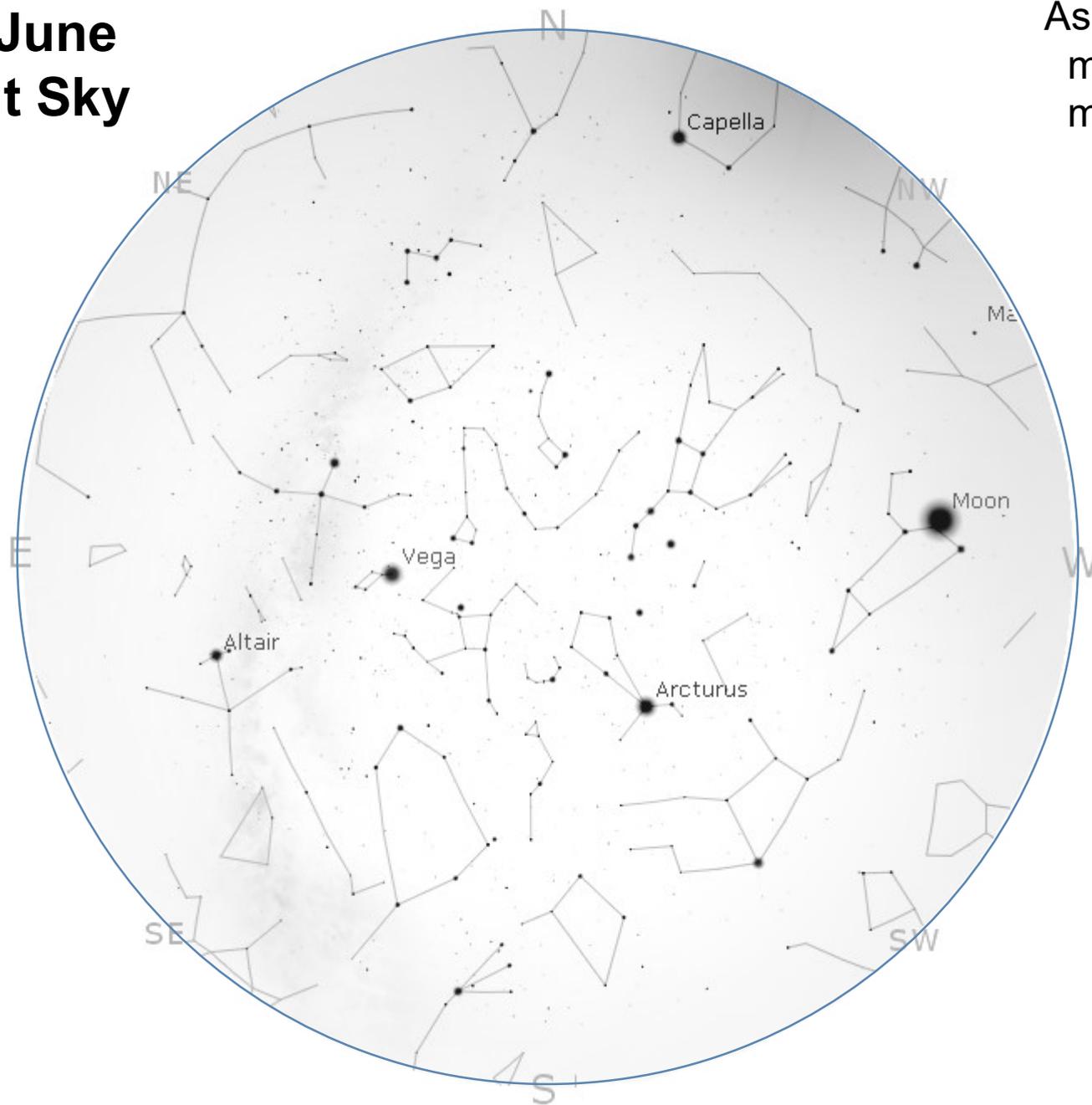
For June 2021



Woking Area U3A  
Astronomy Group

# The June Night Sky

As at 11 p.m.  
mid-month  
mid-month



Credit: Stellarium

# Sun & Moon in June

- **Third Quarter** 2<sup>nd</sup>
- **New Moon** 10<sup>th</sup>
- **First Quarter** 18<sup>th</sup>
- **Full Moon** 24<sup>th</sup>

		Sun	Moon
1 <sup>st</sup>	Rise	04.51	01.57
	Set	21.09	11.14
15 <sup>th</sup>	Rise	04.45	09.18
	Set	21.20	01.02*
30 <sup>th</sup>	Rise	04.49	00.39
	Set	21.21	11.26

All times are BST

\* following day

# The Planets in June

## Mercury

Mercury is an evening object for the first few days of the month, low in WNW, 30 mins after sunset. Becomes a morning object at month end, best seen about 40 mins before sunrise ENE.

## Venus

Venus is an excellent evening object, shining at mag -3.9 in WNW all month from 30 mins after sunset, setting about 1.5 hours after sunset

## Mars

Now virtually lost in the summer twilight

# The Planets in June

## Jupiter

Visible as a brilliant morning object at mag -2.5, low in the SE, rising some three hours before the Sun at the start of the month, five hours by month end.

## Saturn

Like Jupiter Saturn is also a morning object, low in the SSE, rising about two hours before the Sun to begin with but before midnight by the end. Mag +0.4

## Uranus

Effectively not visible this month

## Neptune

Effectively not visible this month

# Astronomical Phenomena in June

<b>1<sup>st</sup></b>	Jupiter will be close to the waning gibbous Moon in early hours
<b>10<sup>th</sup></b>	Partial Solar Eclipse (Annular in Greenland & Siberia)
<b>11<sup>th</sup></b>	Try to find the 1% illuminated crescent Moon $5^{\circ}$ from Venus
<b>12<sup>th</sup></b>	Crescent Moon and Venus make a nice pair, $6\frac{1}{2}^{\circ}$ apart
<b>21<sup>st</sup></b>	Summer Solstice
<b>29<sup>th</sup></b>	Jupiter $6^{\circ}$ from the Moon in the pre-dawn sky

# Meetings at Local Societies

- Given the current Covid-19 situation, all physical meetings at our local astronomical societies have been cancelled until further notice, some continue via Zoom for paid-up members.
- 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.waltonastrogrouop.co.uk/>

# Free Meetings & Talks On-line

- **British Astronomical Association:** Zoom webinars
  - *“Sketching Deep Sky Objects”*
    - Wednesday 9<sup>th</sup> June, 7.00 - 8.30 p.m.
      - Howard Banich
  - BAA Summer Webinar
    - Saturday 26<sup>th</sup> June at 11.00 - 17.30 p.m.
      - *“The Earliest Stages of Stellar Cluster Formation”*
        - Dr Jonathan Shanklin
      - *“Planet-eating White Dwarfs”*
        - Dr Amy Bonsor
- <https://www.britastro.org/meetings>

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

# Free Meetings & Talks On-line

- **Society for Popular Astronomy:**
  - *Friday Night 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/](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:**
  - *“Sino/Russia Technical Forum - Celebrating 50 years of Salyut and ISS Operations”*
    - Saturday 5<sup>th</sup> June at 2.00-4.00 p.m. via Google Meet
  - *“A Simple Combined Cycle Engine”*
    - Saturday 5<sup>th</sup> June at 5.00 - 6.15 p.m. via Zoom
      - Lucas Beveridge

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

# Meetings & talks on-line

- You can also pay £3.00 to watch these on-line talk run by **GoSpaceWatch**: (book via Eventbrite)
  - *“Virgin Orbit – The Premier Satellite Launch Service”*
    - Wednesday 2<sup>nd</sup> June, 7.30 - 9.30 pm
      - Stephen Eisele, Vice President
  - *“An Experimental Flying Machine”*
    - Wednesday 23<sup>rd</sup> June 7.30 - 9.30 pm
      - Ben Evans (Author)

[www.gospacewatch.co.uk/](http://www.gospacewatch.co.uk/)

# Astronomy on TV

## The Sky at Night

### *“UK Space Engineering Special”*

Britain plays a significant role in space engineering, from its membership of the European Space Agency to its work designing and building robots that explore the Solar System. In this episode Maggie and Chris delve into the ways in which British engineering is helping us explore space, from Mars rovers in Stevenage to satellite testing in Oxfordshire.

Sunday 13<sup>th</sup> June BBC 4, 10.00 pm

Thursday 17<sup>th</sup> June BBC 4, 7.30 pm



*That's all Folks!*