Stars Over Surrey

Astronomy & Spaceflight News

30th April 2021

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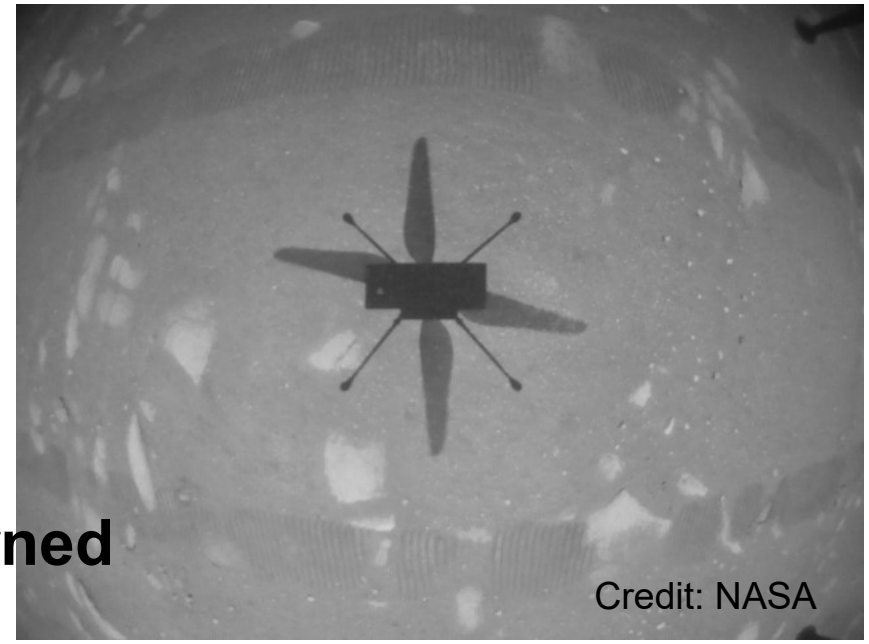
Perseverance & Ingenuity

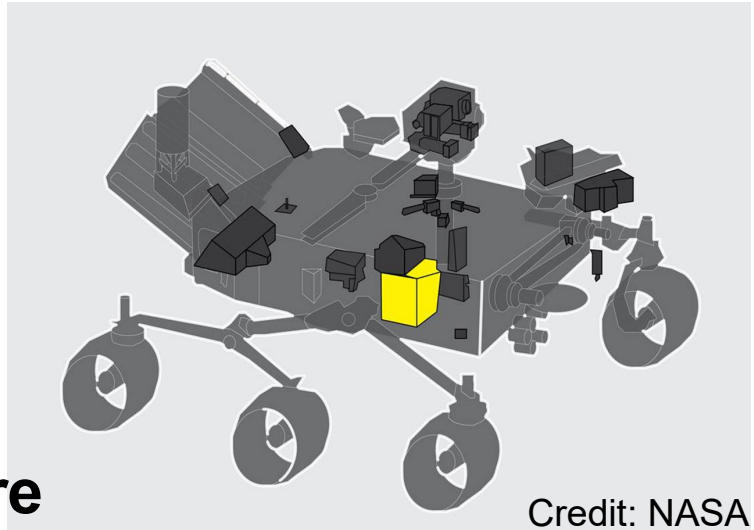
- **Ingenuity takes a "selfie" during its 1st flight**
  - actually its shadow
  - 10 feet up/rotate/down
  - 39 seconds



- **The 2nd flight took it 16' up then laterally 7', then returned to 'Wright Brothers Field'**
- **3rd flight took place on Sunday, it flew laterally 160' and back in just 80 seconds**
  - travelling faster at 4.5 mph (4x faster than 1st test)
- **It has two cameras, one black and white pointing down, and a colour one pointing sideways**
- **To handle the processing involved in autonomous flying, its processor is more powerful than Perseverance's**

Perseverance & Oxygen

- **MOXIE is one of seven instruments on board Percy**
  - Mars Oxygen In-Situ Resource Utilization Experiment
  - size of a toaster (in yellow)



Credit: NASA

- **Has already generated Oxygen directly from Mars's atmosphere**
  - does this by separating one of CO_2's Oxygen atoms leaving Carbon Monoxide which is pumped back out
- **In 60 mins it generated 5.4 grams, enough for a human to breathe for 10 minutes**
  - heats the gas up to 800^{o} C, oven made of heat resistant materials and uses gold foil to protect rest of rover.
- **Oxygen also important for use as a fuel component**
  - future mission might need seven metric tons of fuel and 25 metric tons of oxygen to launch, with one further metric ton of oxygen to last four crew for a year.

Full House at ISS

Credit: NASA

- **The arrival of the SpaceX Crew Dragon Endeavour brings complement up to 11**
  - 10 yrs since there's been so many
  - Crew-1 team of four to return in a few days time in Crew Dragon Resiliance
  - Crew-2 arrivals include NASA's Megan McArthur, wife of Bob Behnken who flew to ISS on the SpaceX test mission last year
    - Also in Endeavour and sitting in same seat!
  - First time a previously flown Falcon 9 has been used for a manned flight and first time a Crew Dragon has been reused.
  - They'll stay on board until early October
- **Second crew arrival at ISS this month**
  - Soyuz brought three crew on April 9th and another Soyuz left with previous three on board on 17th .
- **Truly 'International' - America, Russia, Japan, France**

NASA chooses SpaceX to land astronauts on Moon

- **SpaceX chosen ahead of Blue Origins and Dynetics**
- **All 3 had been commissioned to submit designs for NASA's Human Landing System as an integral part of Artemis**

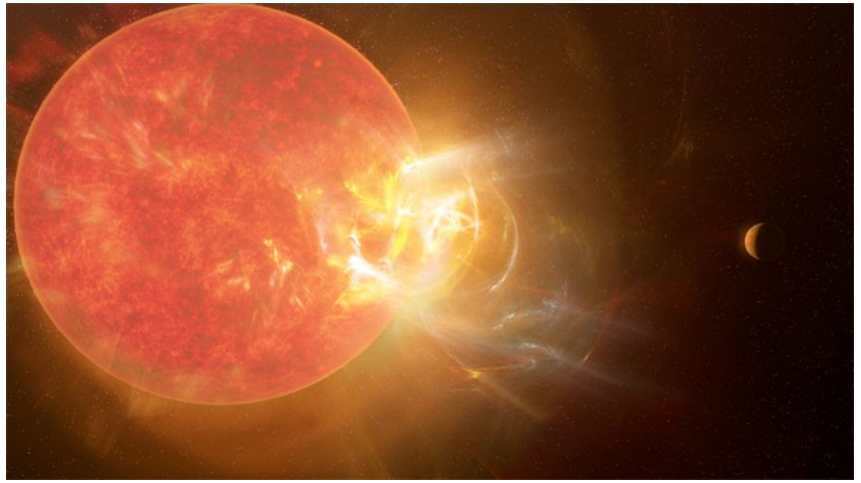
Credit: SpaceX

- **SpaceX's lander is a derivative of its Starship**
  - it will be refuelled with liquid oxygen and liquid methane in Earth orbit before departure to an elongated eliptical orbit around the Moon
  - Artemis crew will launch in an Orion capsule on NASA's SLS giant rocket into lunar orbit. There they will dock directly with Starship and transfer into it for landing. It has a spaceous cabin and 2 airlocks
  - Starship will stand 7½ times taller than the Apollo LEM and with the cabin at the top the astronauts will ride an elevator down to the exit hatch
  - Starship will launch from the Moon, back into Lunar orbit for crew transfer back into Orion for Earth return.
  - An unmanned test will take place first.

Misc Spaceflight News

- **April 12th as 60th anniversary of Yuri Gagarin's flight and also the 40th of the Space Shuttle's 1st flight**
- **One Web this week launched a further 36 of its broadband satellites, bringing total to 182 (650 planned)**
  - Amazon contracts ULA for 9 Atlas 5 launches for its Kuiper BB sats
- **Boeing's STS-100 Starliner crew capsule can't make its test flight to ISS until August/September**
  - docking ports fully occupied untill then
- **SpaceX's Starship prototype SN11 was lost prior to landing, exploded following a "small methane leak"**
  - SN15 set to launch within a week
- **Blue Origin rehearses full manned launch operations with latest sub-orbital launch of New Shepherd**
  - Bezos says "it's time"

Giant Flare seen at Proxima Centauri

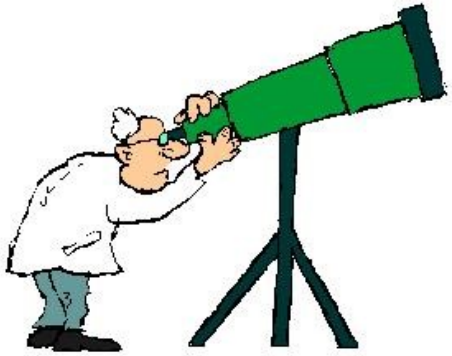


Credit: NRAO/S.Dagnello

- **Proxima Centauri is the nearest star to Solar System and is a red dwarf star**
- **These are known to flare more than stars like the Sun**
- **Nine different observatories monitored the star together over a period in 2019 and a paper outlines the findings**
  - observing in multiple wavelengths
- **One titanic flare lasted just seven seconds but its energy was 100+ times any flare observed on the Sun**
  - In ultraviolet wavelengths it went from normal to 14,000 times brighter over a few seconds
- **Proxima Centauri has two known planets, one approx. Earth-sized, so the study assesses the likely impact of such flares on any potential ecology.**
  - Nothing Earthlike could evolve under such a battering.

What's Up!

For May 2021



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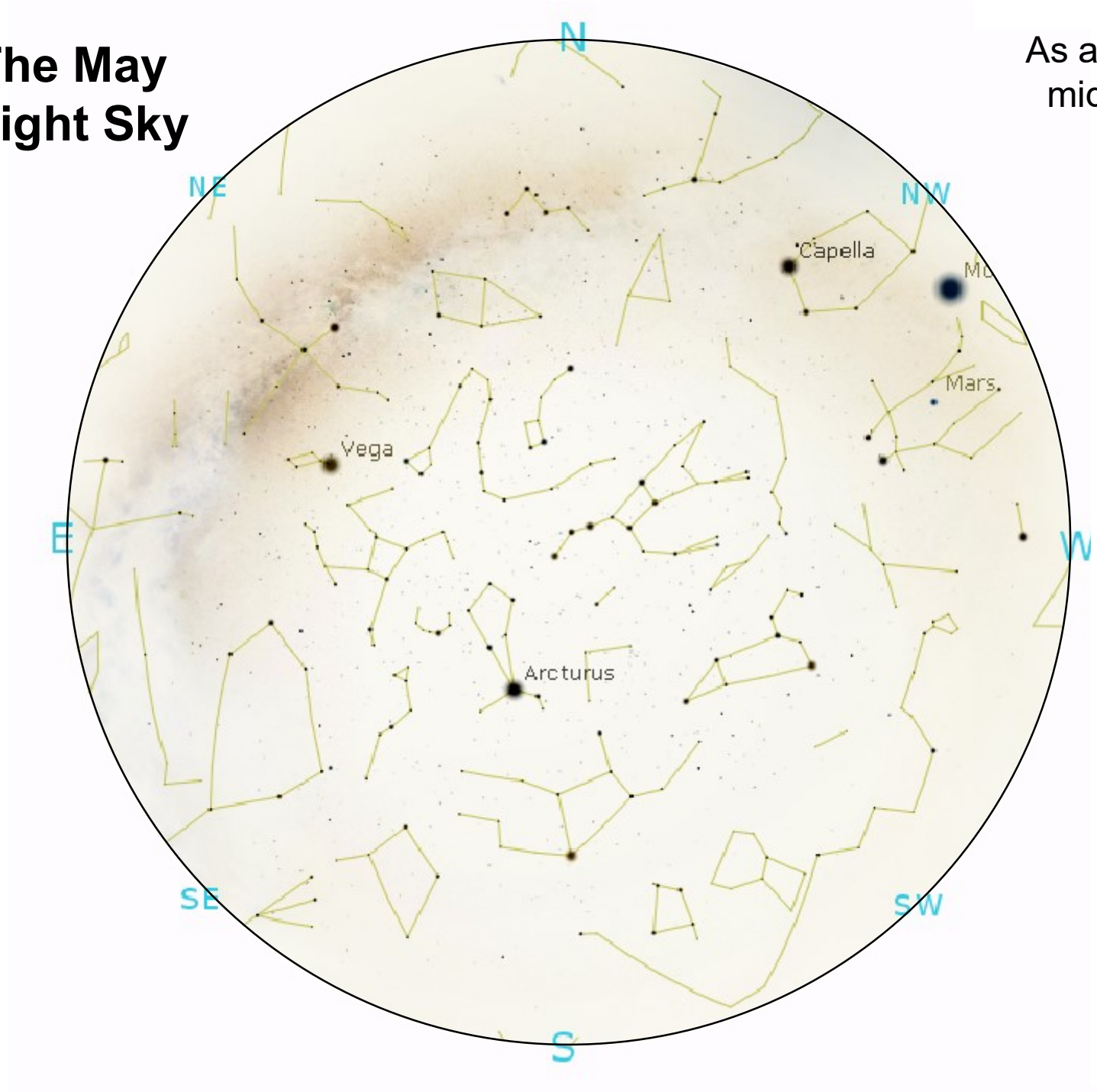
The May Night Sky

As at 11 p.m.
mid-month



Sun & Moon in May

- **Third Quarter 3rd**
- **New Moon 11th**
- **First Quarter 19th**
- **Full Moon 26th**

		Sun	Moon
1st	Rise	05.34	01.14
	Set	20.25	08.36
15th	Rise	05.11	07.15
	Set	20.47	00.42*
31st	Rise	04.52	23.58
	Set	21.08	07.42^

* following day

All times are BST

The Planets in May

Mercury

Mercury is now an evening object and is best seen at the start of the month, low in WNW, 30 mins after sunset.

Venus

Venus is also an evening object, visible all month but better towards the end of the month, shining at mag -3.9 in WNW from 30 mins after sunset

Mars

Continues to deteriorate but still easily visible in the first half of the month in the West, but gets lost in the twilight by month end

The Planets in May

Jupiter

Visible as a morning object, low in the SE, about 70 mins before Sunrise at the start of the month. By month end it will be rising some three hours before the Sun

Saturn

Like Jupiter Saturn is also a morning object, low in the SSE, rising about two hours before the Sun

.

Uranus

Not visible this month

Neptune

Not visible this month

Astronomical Phenomena in May

4th	Mercury will be approx 2° below the Pleiades and about 6° above Venus, low in NW, about 30 mins after sunset
6th	The Eta Aquarid meteor shower peaks this morning, best seen from 2.30 a.m. until morning twilight
13th	The Moon, Mercury and Venus form a nice triangular group in the West about 40 mins after sunset
18th	The clair-obscur effects Lunar X and Lunar Y form about midnight, best seen in the early hours of 19th
28th	Venus & Mercury will be only ½° apart low in NW, about one hour after sunset at mag -3.8 and +2.3 respectively
31st	Saturn will be 5° above the waning gibbous Moon in the pre-dawn Eastern 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.waltonastrogroup.co.uk/

Free Meetings & Talks On-line

- **British Astronomical Association**: Zoom webinars

  - "*Comet 29P/Schwassmann–Wachmann"*
    - Wednesday 12th May, 7.00 - 8.30 p.m.
      - Dr Richard Miles

  - *"George Alcock goes to Antarctica"*
    - Wednesday 26th May at 7.00 - 8.30 p.m.
      - Dr Jonathan Shanklin

- 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/

- (will also be viewable via SPA's YouTube Channel)

Free Meetings & Talks On-line

- **British Interplanetary Society**:

  – *"Building the UK's first Commercial Vertical Spaceport"*

    - Saturday 8th May at 2.00 - 3.15 p.m. via Zoom
      – Scott Hammond, Shetland Space Centre

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)
  - *"Mining the Moon"*
    - Wednesday 5th May, 7.30 - 9.30 pm
      - Dr Hannah Sargeant (Open University)
  - *"From Scotland to Space"*
    - Wednesday 26th May 7.30 - 9.30 pm
      - Robin Hague (Head of Launch, Skyrora)

www.gospacewatch.co.uk/

Astronomy on TV

The Sky at Night

"Mapping The Milky Way"

The European Space Agency's Gaia spacecraft is producing a 3D map of the Milky Way. Mission scientists hope the results from the sky survey will help reveal the galaxy's composition, formation and evolution. In this episode Chris and Maggie look at what the mission has discovered so far, and what the latest results might reveal about our galactic neighbourhood.

Sunday	9th	May	BBC 4, 10.00 pm
Thursday	13th	May	BBC 4, 7.30 pm


That's all Folks!