Stars Over Surrey

Astronomy & Spaceflight News

28th February 2020

Heather Couper RIP

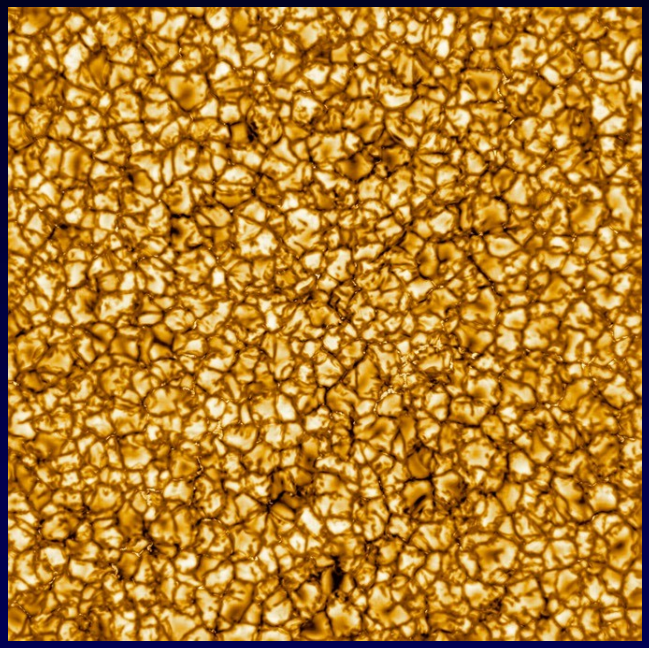
- Heather passed away 19th Feb aged 70
- She was one of the most prolific astronomy presenters and writers, and the 1st female one
  - She presented Channel 4's *The Planets* (1985) and *The Stars* (1988)
  - On Radio she co-led *Seeing Stars* on BBC World Service with Nigel Henbest
- 1st female president of BAA & SPA
- 1st female Professor of Astronomy at Gresham College
- She inspired many people to develop an interest in astronomy

Solar Orbiter launched!

- Solar Orbiter was launched by an Atlas V on 20th Feb from Cape Canaveral
- It will complement the work done by NASA's Parker Solar Probe
- It will use a complicated series of planetary fly-bys for gravity-assist changes to it's trajectory, first being Venus in Dec this year
- Highly elliptical orbit, 0.28 AU to 0.91 AU but will be able to see “down” onto the polar regions of the Sun
- Orbit brings it to the Sun every 6 months on a 7 year mission
  - will have to withstand 500°

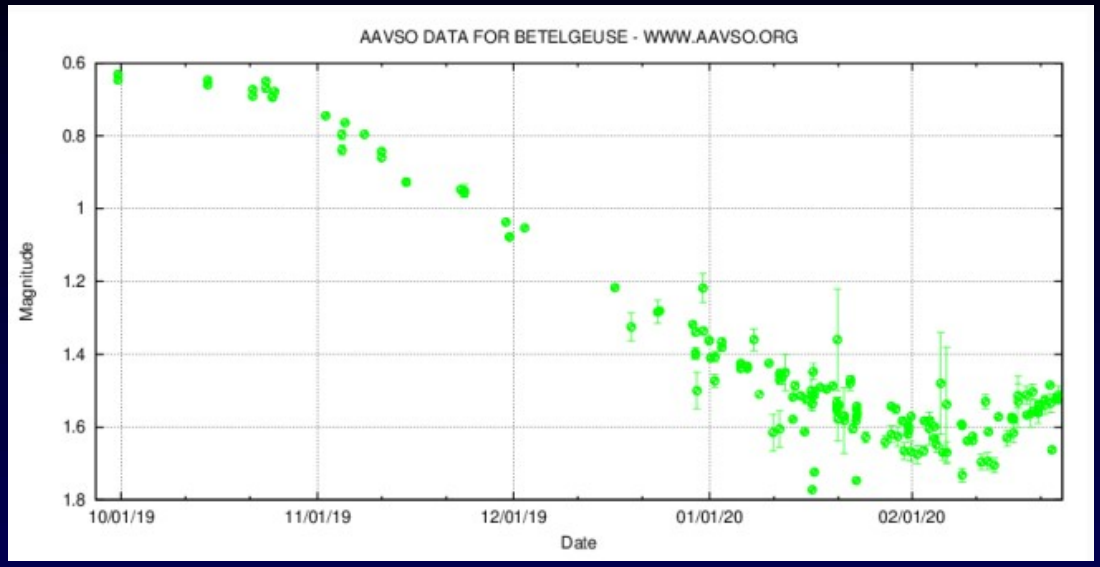
First images from new Solar telescope

- The Daniel K. Inouye 4 metre solar telescope sits on Mt. Haleakala in Hawaii
- It uses 7 miles of piping and uses a swimming pool of ice per day to keep cool
- It's first-light images show the most stunning detail
  - plasma cells as big as France
  - details as small as 18 miles across
- Between the cells bright areas can be seen caused by magnetic storms
  - possibly channeling heat up to the Corona?



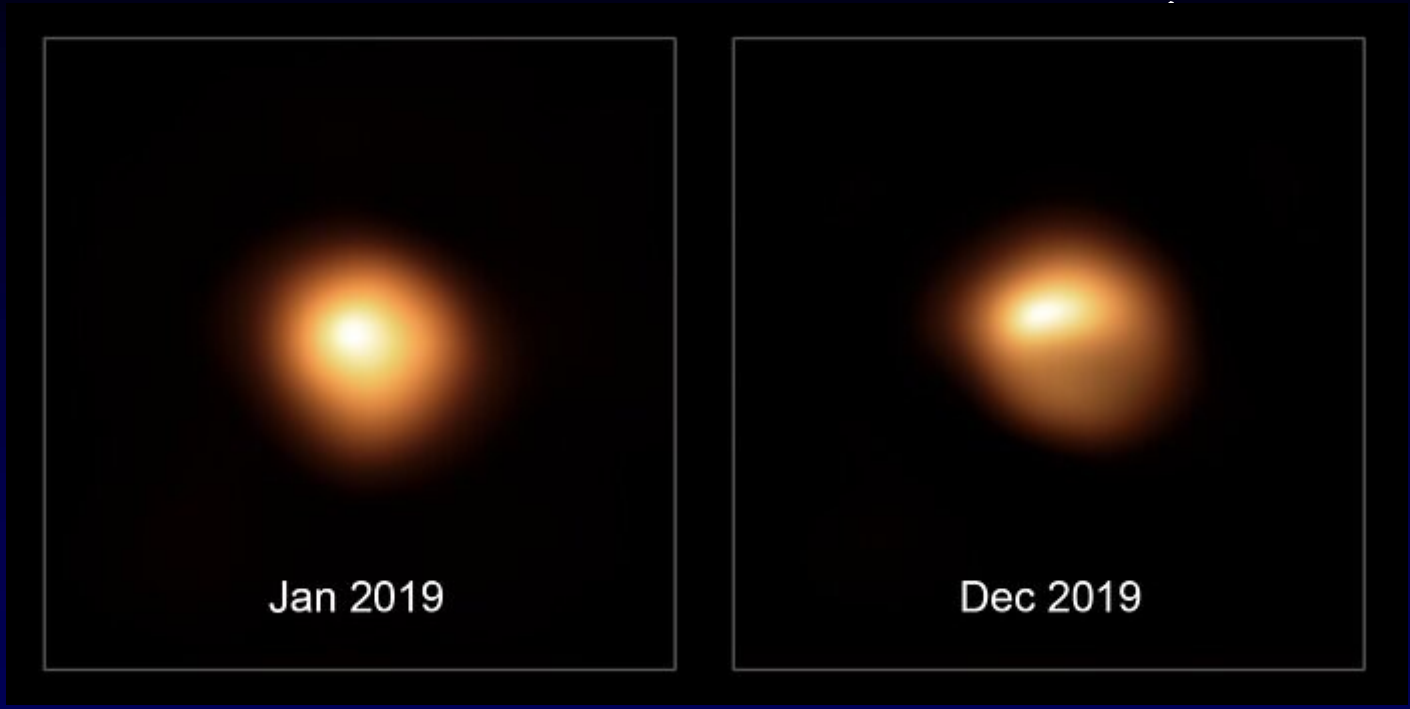
Video at https://astronomynow.com/2020/01/29/daniel-k-inouye-solar-telescope-dazzles-with-first-light-images/

Betelgeuse begins to brighten again



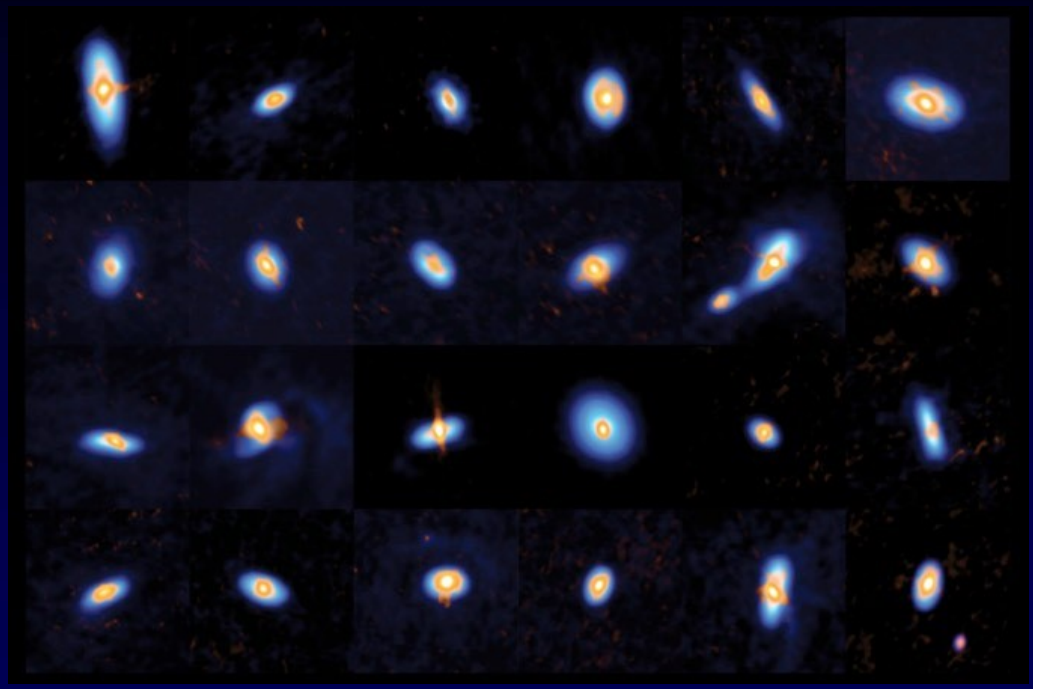
- Betelgeuse has just started to brighten again, according to Villanova University, using their own photometric data & that from the American Association of Variable Star Observers
- This was actually predicted, on the basis that this “fainting” was merely a particulalry deep instance of its 430 day periodicity (one of three periods the star has)
  - so we can call-off the Supernova watchers!

Betelgeuse begins to brighten again



- However ESO's VLT telescope in Chile has imaged the star and shows the dimming is uneven, just on one hemisphere
  - no-one know why!
- There also seems to be a mysterious lop-sidedness to the expected sphereical image

Orion - Protostars Studied



- Two large radio telescopes have teamed up to study 300 protostars being formed in the Orion Molecular Cloud
- VLA (Very Large Array) & ALMA (Atacama Large Millimetre/submillimetre Array) can pierce the huge clouds of dust and gas within the gas cloud, working in different frequencies, to see what viusal telescopes cannot
- ALMA shows the outer protoplanery disc structure (blue)
- VLA shows the inner disc and infant stars
- Already learning about mass of young protostellar systems.

NASA's Christina Koch back on Earth

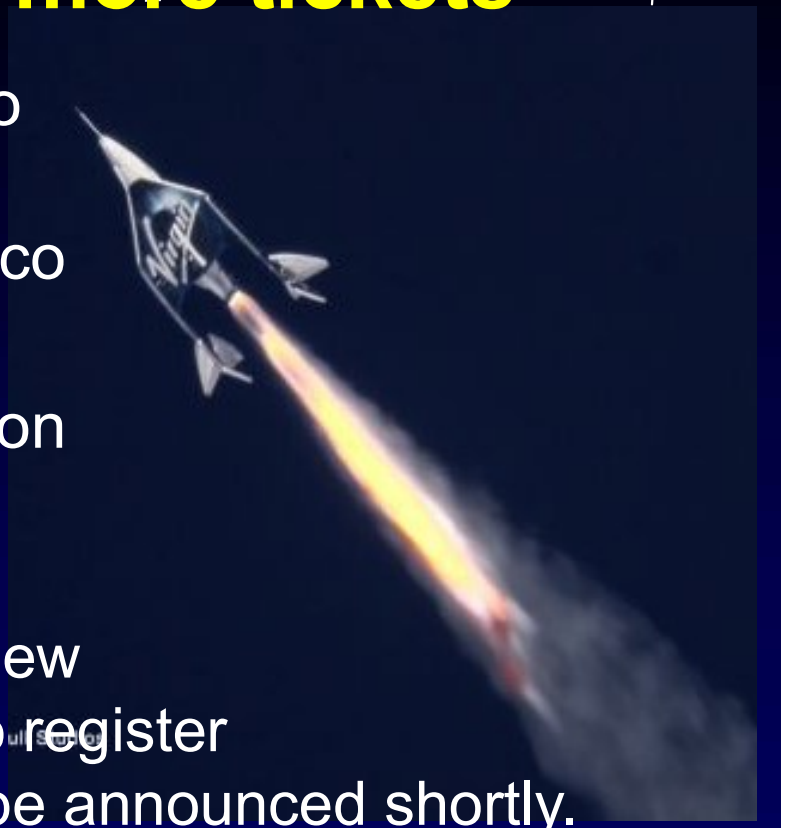
- Arrived back from ISS after record breaking trip
  - Her mission lasted 328 days, the longest by a female
  - 6 space walks, including 1st all-female one
  - 5248 orbits & 139 million miles

NASA's Christina Koch back on Earth

1st entirely British component on ISS

- A Cygnus resupply vessel docked recently at the ISS
- On board was an ESA funded antenna to be mounted during an spacewalk on the outside of the Columbus module to provide fast uplink/downlink data transfers between ISS and Earth
- This was built by MDA Space and Robotics Ltd, Harwell and is the very first completely British component on the ISS.

Virgin Galactic to sell more tickets



- VSS Unity and White Knight Two have relocated from Mojave to Spaceport America in New Mexico
- Two more of the sub-orbital spaceships are under construction
  - Spaceport America can house 5x spaceships and 2x carriers
- The company has announced a new qualification scheme for people to register for tickets, a second tranche will be announced shortly.
- The qualification scheme is called “One Small step” and the actual registration procedure is “One Giant Leap”
- It's understood that the first commercial sub-orbital flights will begin later this year.

Space X announce Crew Dragon tourism

- Space X has come to an arrangement with Space Adventures to fly private citizens on commercial orbital flights on Crew Dragon
  - Space Adventures was the company that arranged the private flights to the ISS between 2001 and 2009,using Soyuz
- The Crew Dragon will not visit the ISS but will enter a higher Earth orbit, with the trip probably lasting 4 or 5 days.
- Likely cost is thought to be about $50 M
- There would be four passengers and no professional Space X or NASA astronauts on board
  - The Crew Dragon can fly completely autonomously
  - training would only be a couple of months
- The earliest such flight could be Q4 2021

Starlink Joined by OneWeb

- There have been two more launches by Space X, each of 60 more Starling broadband satellites
  - 29th January and 17th February
  - 1st stage landed OK on drone ship for one, missed the other
- OneWeb's first multiple launch occurred on 7th Feb with a Soyuz launched 34 satellites from Kazakhstan
  - 10 more launches this year, from Kazakhstan, Russia and French Guiana
- OneWeb need fewer satellites than Space X
  - Starlink orbit at 550 kilometres, OneWeb at 1,200 k
  - OneWeb “see” over the horizon and have direct links
- Jeff Bezos is also planning to enter the market !

Two possible fixes for InSight's Probe

- A year after it first failed, there are two current plans to get the probe working again on Mars.
- The main one is to use lander's robotic arm to press down on the probe's top cap and shove it through the harder than expected rogolith
  - The big risk is this could cause damage to the electric control cable that trails behind the probe, so there will be several dummy runs in March to test out procedures.
- The other plan is to pile up lots of soil around the probe using the scoop.

Breaking News:
Insight's seismometer has detected 450 marsquakes since landing!

Analysis of New Horizon's data confirms gentle collision theory

- New Horizons flew past Arrakoth on 1st Jan 2019
- Images showed two separate flat lobes joined by a neck
- No apparent fractures indicated there hadn't been a violent collision
- Accretion via gentle collision suggested
- Downloaded data from New Horizons confirms this theory
- Causes rethink of likely models of early Solar System proto-planetary formation.

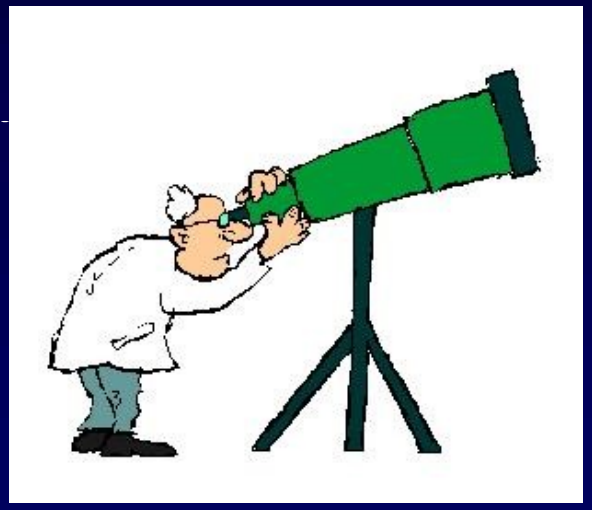

Voyager 1's “Pale Blue Dot” image
re-processed for 30th anniversary

Carl Sagan

- “Look again at that dot. That’s here. That’s home. That’s us. On it everyone you love, everyone you know, everyone you ever heard of, every human being who ever was, lived out their lives. The aggregate of our joy and suffering, thousands of confident religions, ideologies, and economic doctrines, every hunter and forager, every hero and coward, every creator and destroyer of civilisation, every king and peasant, every young couple in love, every mother and father, hopeful child, inventor and explorer, every teacher of morals, every corrupt politician, every ‘superstar,’ every ‘supreme leader,’ every saint and sinner in the history of our species lived there – on a mote of dust suspended in a sunbeam.”

What's Up!

For March 2020

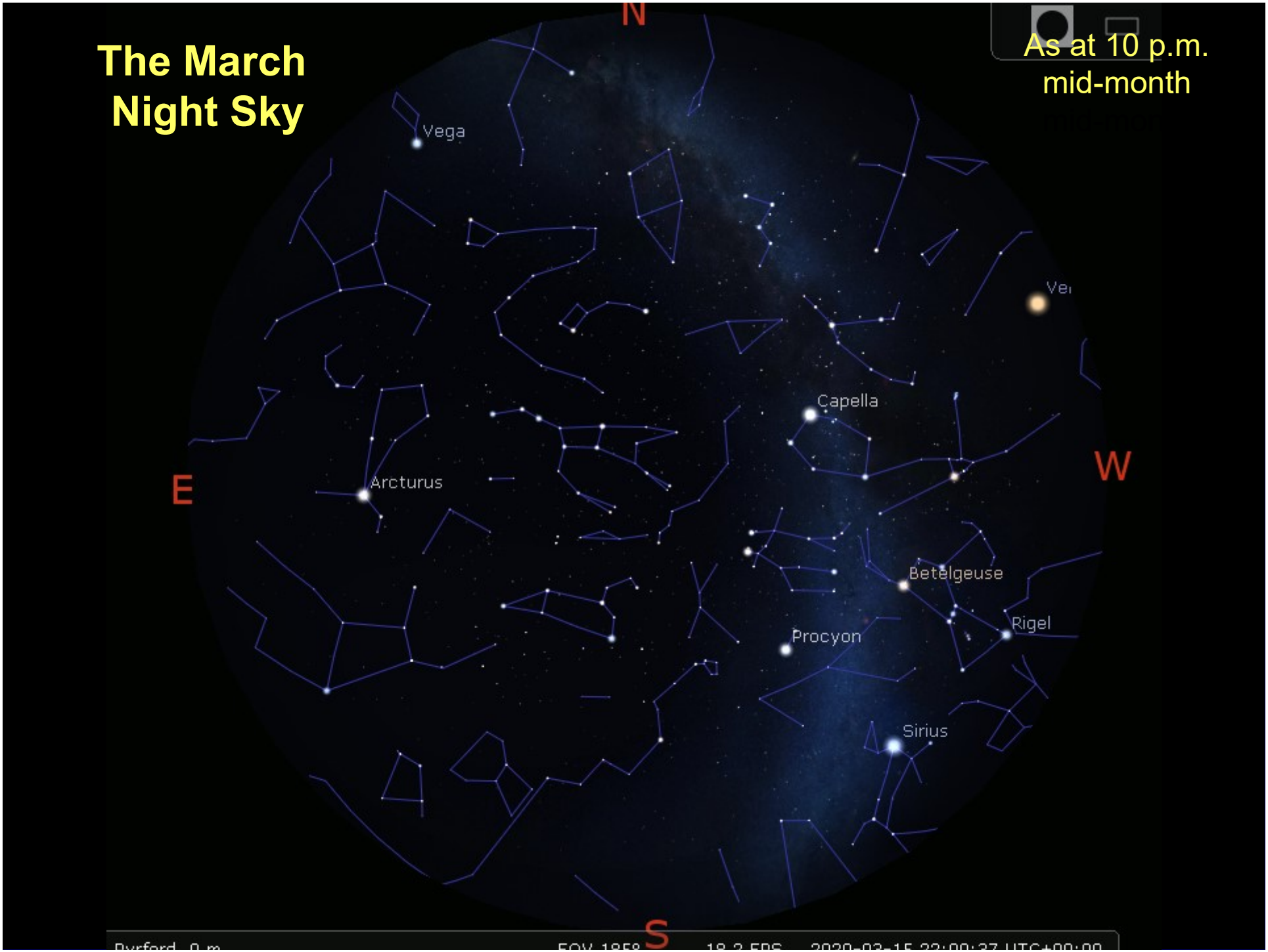


Woking Area U3A
Astronomy Group

Exhibitions at National Maritime Museum, Greenwich

- **Astronomy Photographer of The Year**
  - until 26th April 2020
  - £9.00

The March Night Sky



Sun & Moon in March

- First Quarter 2nd
- Full Moon 9th
- Last Quarter 16th
- New Moon 24th

		Sun	Moon
1st	Rise	06.56	10.20
	Set	17.43	02.37
15th	Rise	06.15	03.20
	Set	18.07	11.04
31st	Rise	06.39	10.53
	Set	17.34	04.46

What's Up - Planets

- **Mercury**
  - A morning object, best seen mid-month very low in the East South East, about 30 mins before sunrise
- **Venus**
  - A brilliant evening object shining at mag -4.3 in the West. Visible for most of the evening, it shows a 'half-Moon' phase through a small telescope.
- **Mars**
  - A morning object in the South East, the planet slowly improves as the month draws on, brightening slightly.

What's Up - Planets

- **Jupiter**

– Visible as a low morning object in the South East predawn skies, brightening to mag -2.0 by month end.

- **Saturn**

– A low morning object low in the South East, near Mars & Jupiter.

- **Uranus**

– Best seen early evening 22° high in the West through binoculars or telescope 

- **Neptune**

– Not visible this month

Phenomena in March

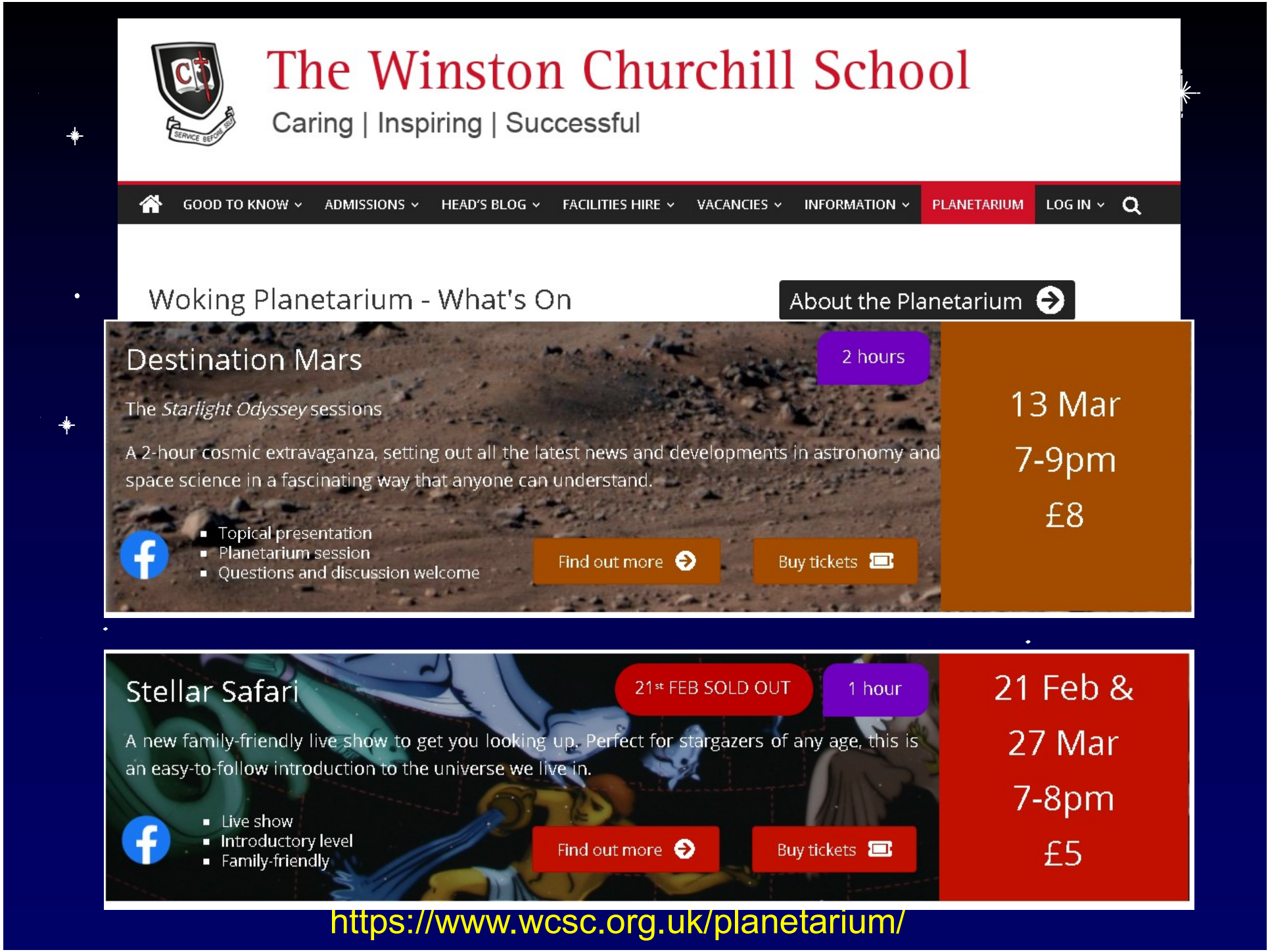
- **2nd** 1st quarter Moon close to Hyades cluster in Taurus 
- **6th** Gibbous Moon sits across top of M44 Beehive cluster 
- **8th** Uranus lies approx 2° below and to left of Venus 
- **19th** Saturn lies 4° NW of waning crescent Moon 
- **26th** Saturn, Mars & Jupiter form a triangle low in SE before dawn 
- **28th** Thin crescent Moon, Venus and M45 Pleiades close together in Western evening sky. 
- **29th** Start of British Summer Time, clocks go forward

Planetary Line Up 26/3/20

Using Stellarium

Moon, Venus & Pleiades 28/3/20

Using Stellarium



https://www.wcsc.org.uk/planetarium/

Meetings at Local Societies

- **Guildford AS** ***Lecture Theatre L, Uni of Surrey***
  - **Thursday 5th March, 19.30 hrs**
    - **Surrey Satellite Technology**
      - **Dr. Spyridon Grammenos**
        - » SSTL

Meetings at Local Societies

- **Farnham AS** ***Aldershot Cricket Club***
  - **Tuesday 10th March, 19.45 hrs**
    - **Astronomy Using Tablet and Smartphones**
      - **Dr. Lilian Hobbs**

Meetings at Local Societies

- **Croydon AS** *Royal Russell School, Coombe Lane, Croydon*
  - Friday 6th March, 19.45 hrs
    - Spectroscopic Binaries
      - Konrad Mallin-Smith
  - Fridays 20th March, 19.45 hrs
    - A Window Through The Universe
      - Peter Bull

Meetings at Local Societies

- **Ewell AS** ***Nonsuch High School for Girls, Cheam***
  - **Friday 13th March, 19.45 hrs**
    - **Mercury's Long Afternoon**
      - **David Fishwick**
        - » Ewell AS

Meetings at Local Societies

- **Walton Astronomy Group**
  - **Friday 13th or Saturday 14th March, 8pm till late**
    - **Dark Sky Trip (Stargazing session)**
      - **Venue & night to be decided nearer to date**
        - » **check website for details**

http://www.waltonastrogroup.co.uk

University of Surrey

- **Department of Physics**
  - **Wednesday 18th March 19.00 hrs**
  - **Lecture Theatre E**
    - **Talk**
      - title & speaker tbc
    - **followed by Stargazing (if clear)**
      - **or**
    - **Night Sky Talk**
  - **Free event, but booking required, via web site**
    - https://www.surrey.ac.uk/department-physics/outreach/astronomy-evenings

- **Astronomy Evening**

Astronomy on TV

The Sky at Night

No programme this month, back in April


"That's all Folks!"