

Stars Over Surrey

Astronomy & Spaceflight News

25th January 2019

BROOKLANDSRADIO

ONLINE

The Sound of Surrey



Last Complete Total Lunar Eclipse for Decade ✨



Best photo I could get from
my cloudy part of Surrey

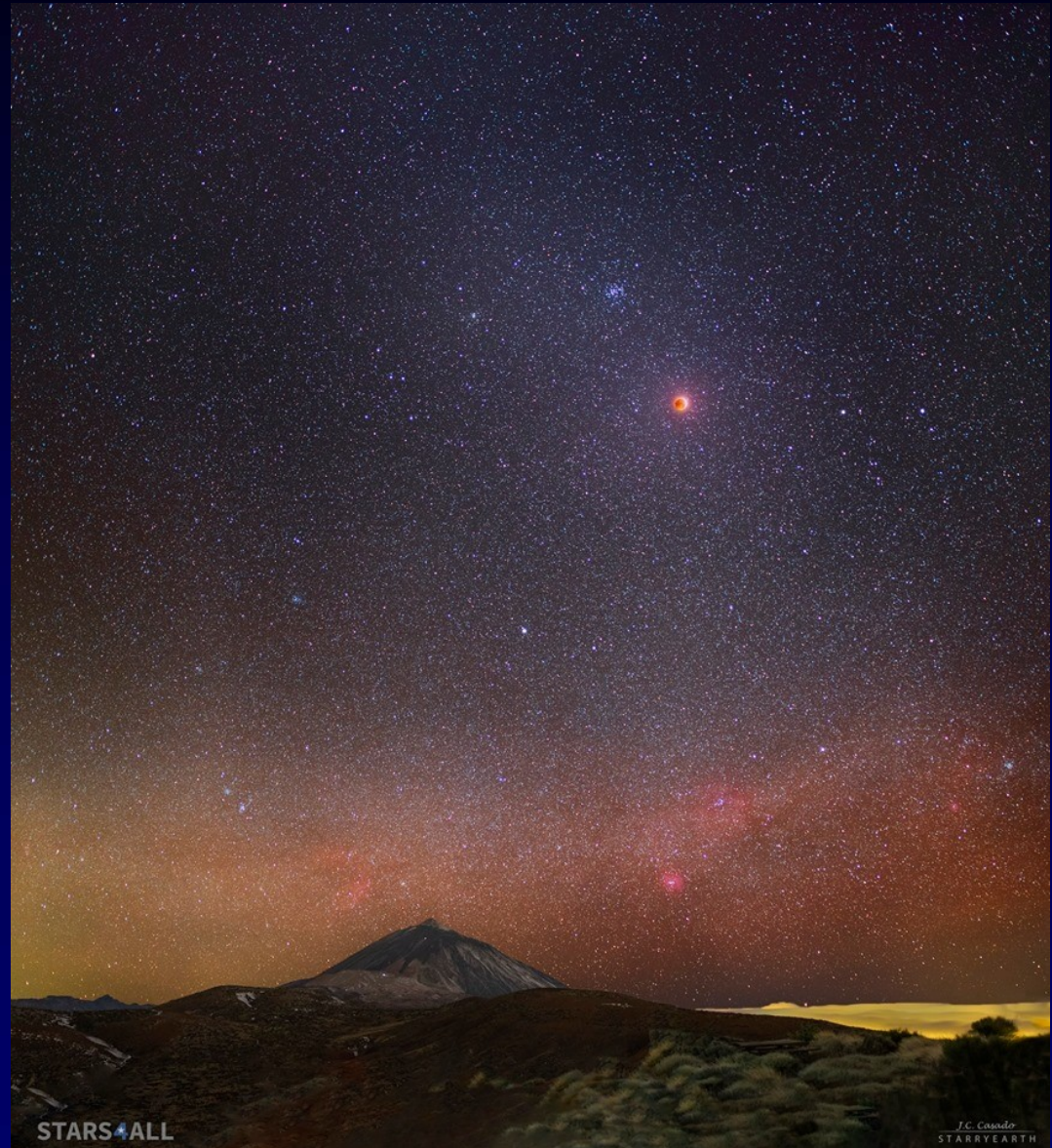
Last Complete Total Lunar Eclipse for Decade ✨



From Connecticut ▲

From Canary Islands ►

Note "Gegenschein" ✨



Meteor Hits Moon During Total Lunar Eclipse



Meteorite impact on the Moon
21 January 2019, 4:41:43 UTC

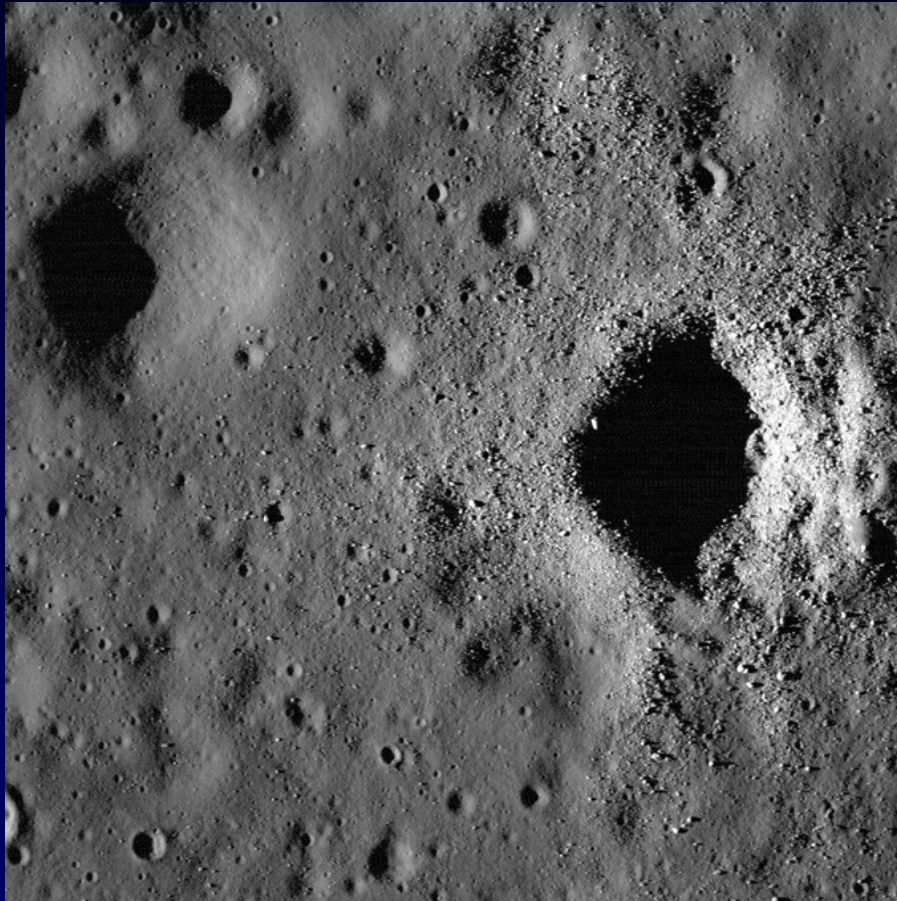
Captured during lunar eclipse
Boa Vista Island, Cape Verde
N16.1436104,W22.8640448



Meteor Hits Moon During Total Lunar Eclipse

- Precise co-ordinates identified
- NASA's Lunar Reconnaissance Orbiter will be tasked to survey the area for signs of the strike
- Coincidentally only the day before Eclipse NASA announced that asteroid/meteor hits on the Moon have double or trebled in last 290 M years
 - crater ageing is done by thermal measurement
 - newer ejecta stays warm longer than debris from ancient impacts, which will have been eroded by micrometeoroid impact into finer particles which cool more rapidly
 - increase probably due to asteroid collision, scattering chunks around inner Solar System
- Moon and Earth likely to have similar impact history
 - on Earth we lose that history because of surface destruction via plate tectonics

New vis-à-vis ancient lunar craters

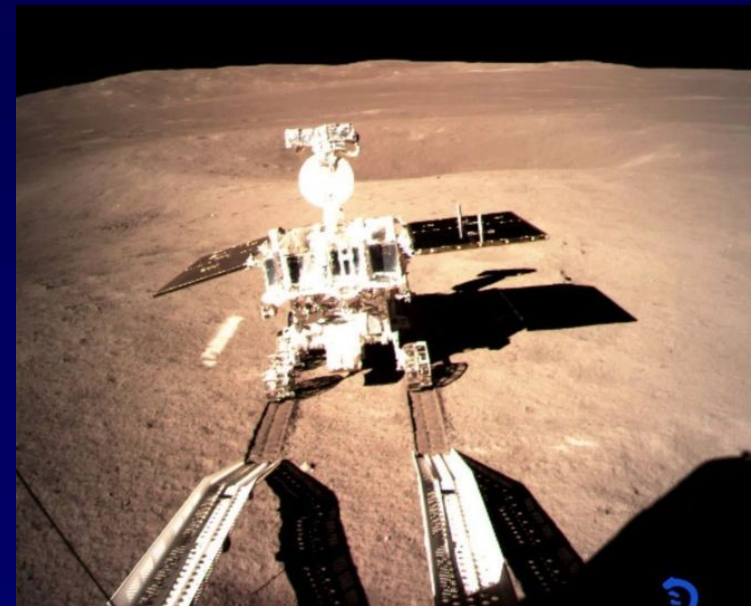


- LRO Image showing young crater to right, old to left
- Note profusion of boulders near new crater, complete absence near old
 - boulders weathered down to fine tilth

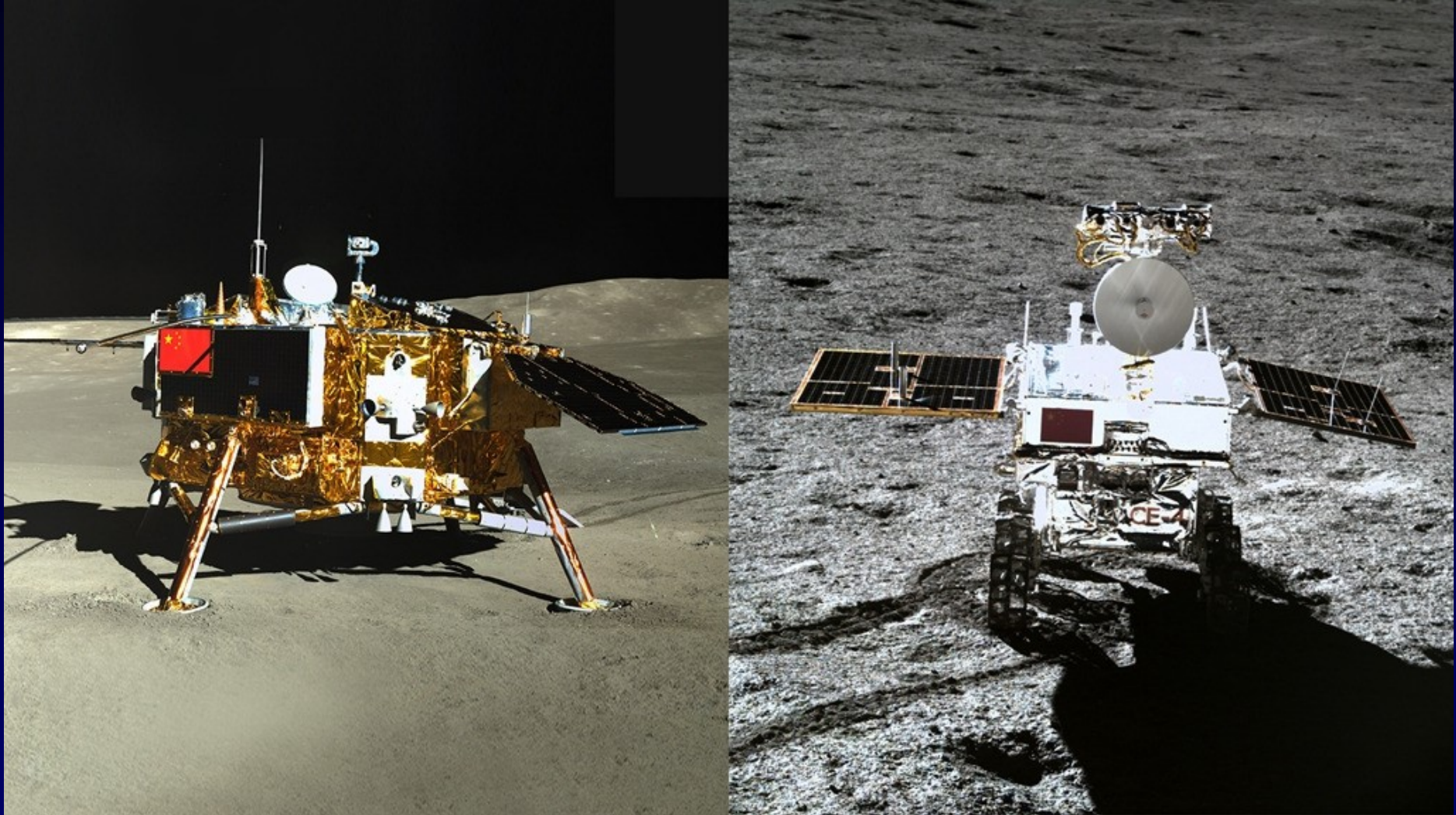
Chang'e 4 lands on Moon's Far Side

- First ever landing on the Moon's far-side has been achieved by China
 - landing site inside 112 mile wide Von Kármán crater
 - itself within the huge deep impact crater South Pole Aitken Basin
 - 1600 miles wide, 8 miles deep
 - will enable study of pristine mantle material
- Yutu 2 rover deployed
 - based on Chang'e 3 lander/rover combination
 - “Jade Rabbit - 2”

- “That's one small step for a rover, one giant leap for China”



Lander & Rover photograph each other



Bio Experiments Onboard Cheng'e 4



- Seeds, fruit flies in sealed biosphere container.
 - Cotton seed sprouted, then died in cold lunar night
 - seeds for potato & cabbage-related plant
 - fruit flies?

“That's one small shoot from a seed, one giant leaf for plantkind”

New Horizons surveys Ultima Thule

- Binary object, joined by 'neck' which melted then rapidly refroze, glueing the two lobes together.
- Spherical shapes suggest gradual isotropic accretion
 - i.e. small particles coming from all directions clumping together
- Mystery - why the light colour round the neck?



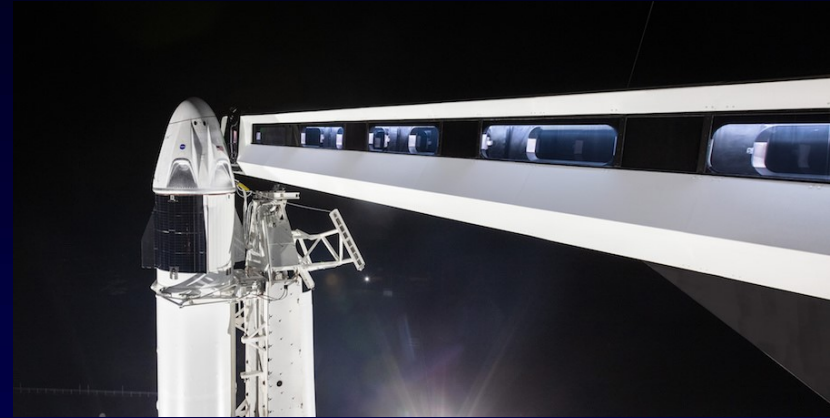
Blue Origin - New Shepherd flight

- New Shepherd takes NASA experiments to edge of space in sub-orbital hop, 22/1/19
 - capsule separated & parachuted back
 - Booster landed back 10 mins after launch
- First passengers “by year end”



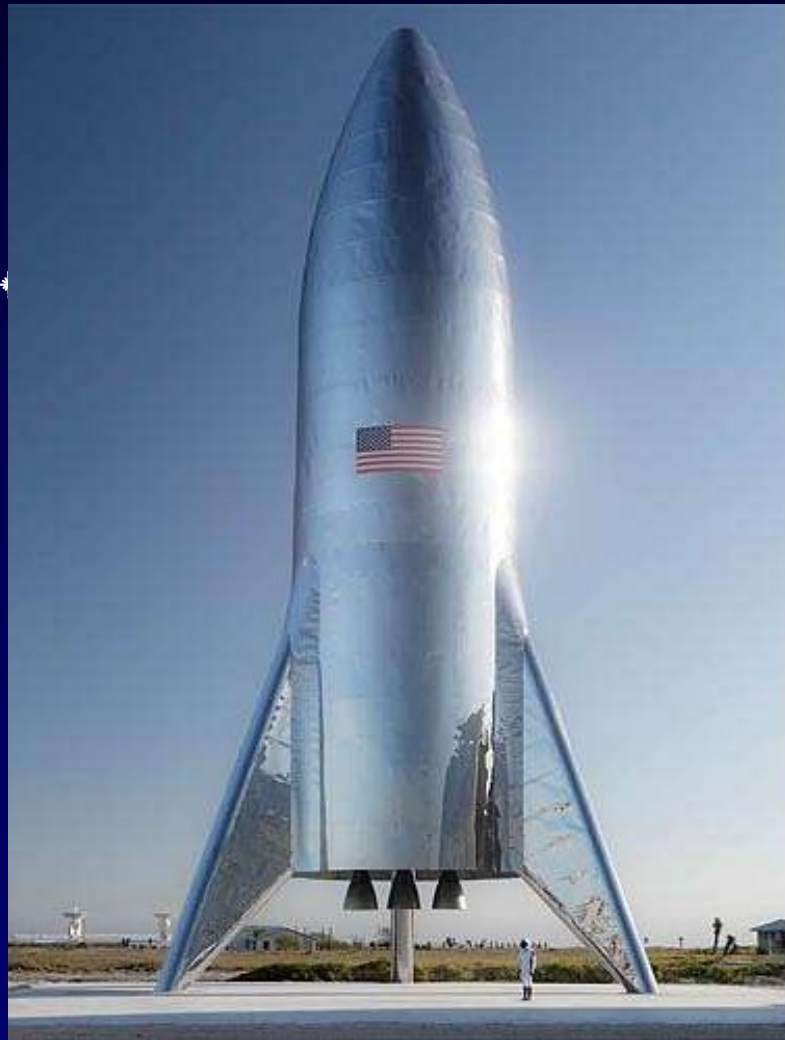
Space X - misc news

- Cape Canaveral, 3rd Jan
 - Falcon 9 with Crew Dragon moved onto Pad 39A for tests including connection to crew transfer bridge
 - static test firing 24th Jan
 - first flight (unmanned) in early Feb
- Dragon returns safely from ISS with 2 tons 13th Jan
- 11th Jan: Falcon 9 launches final ten Iridium replacement satellites
- 11th Jan: Space X lays off 10% workforce!



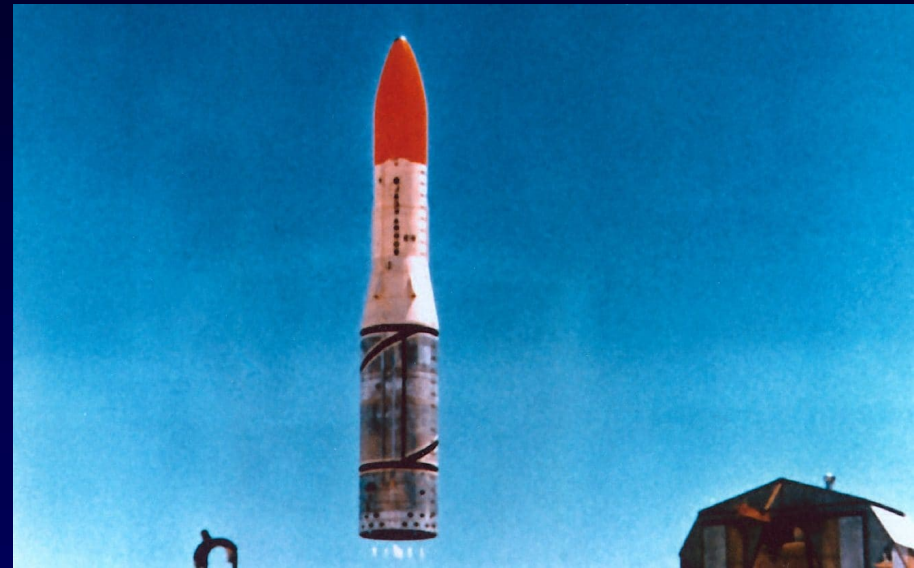
Space X - first pictures of Star Hopper

- Star Hopper is Starship prototype, First Flight - June 2019?



Black Arrow to be displayed in Scotland

- 1st stage rocket for UK's only independently launched satellite 'Prospero'
- Built & Tested in Isle of Wight
- Launch from Woomera
 - 28/10/71
- Programme cancelled
 - money diverted to Concorde

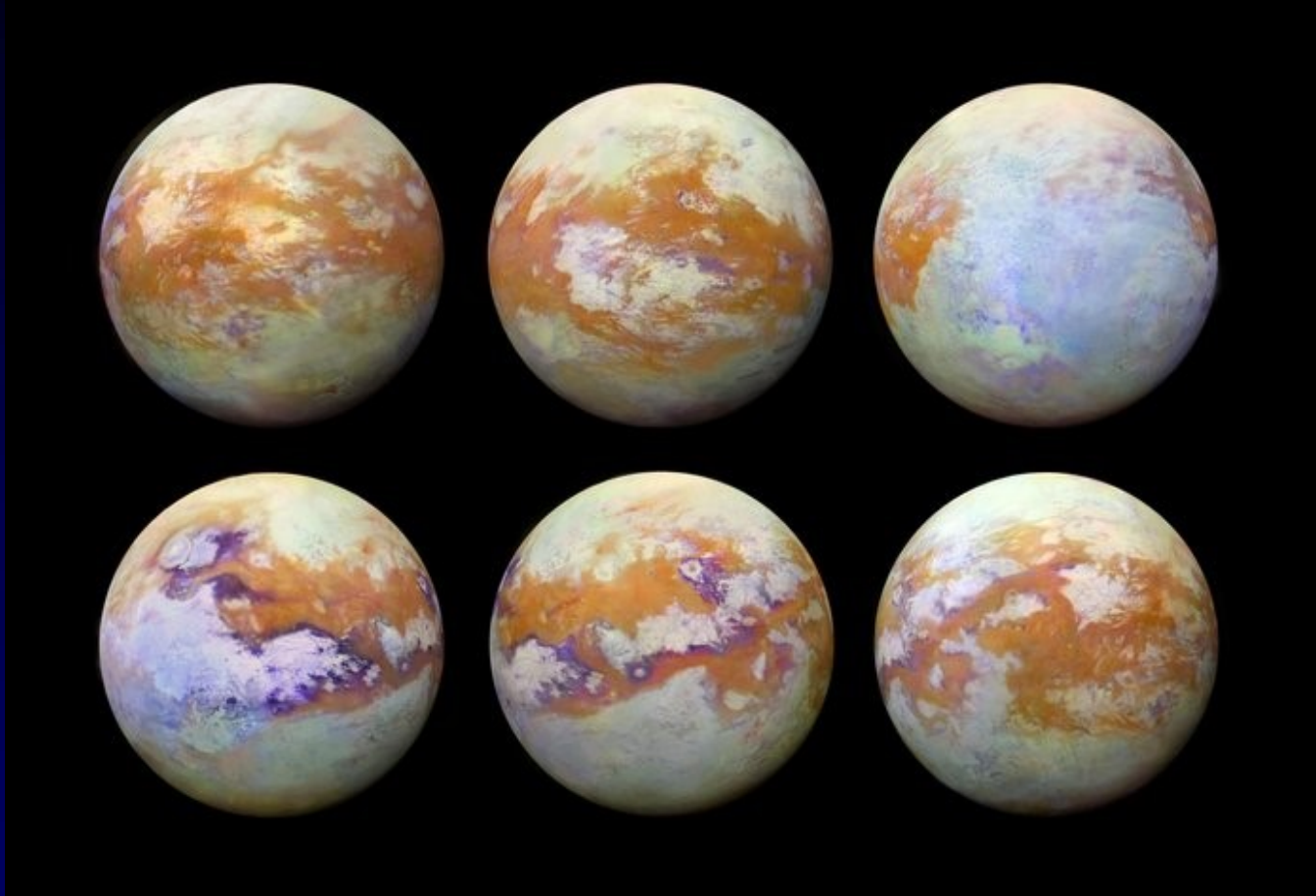


Black Arrow to be displayed in Scotland

- Black Arrow now back from Australian Desert
 - remained for 48 years where it crash landed in desert since launching Prospero
 - brought back by Skyrora
 - space tech company
 - just launched sub-orbital test rocket
 - hope to launch from planned Scottish Spaceport
 - will be displayed at company HQ at Penecuik, Midlothian



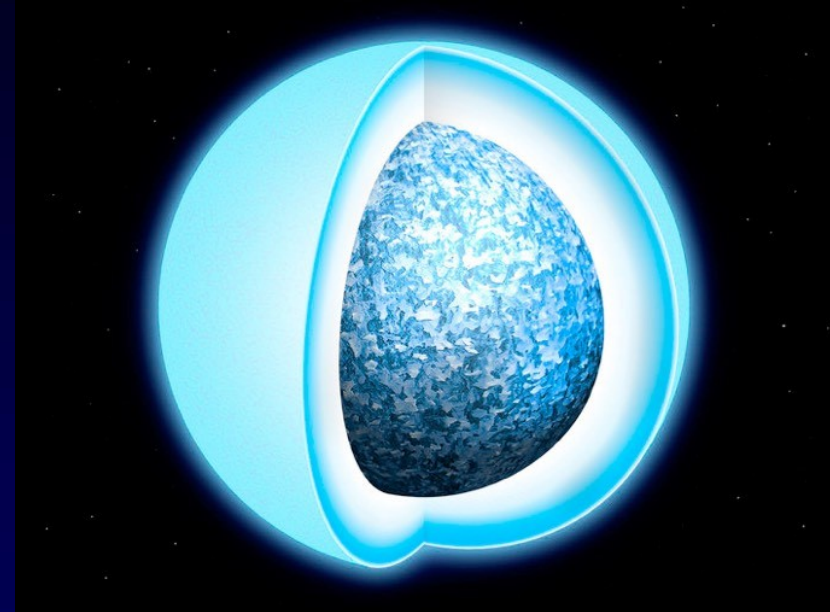
Titan in Infra Red



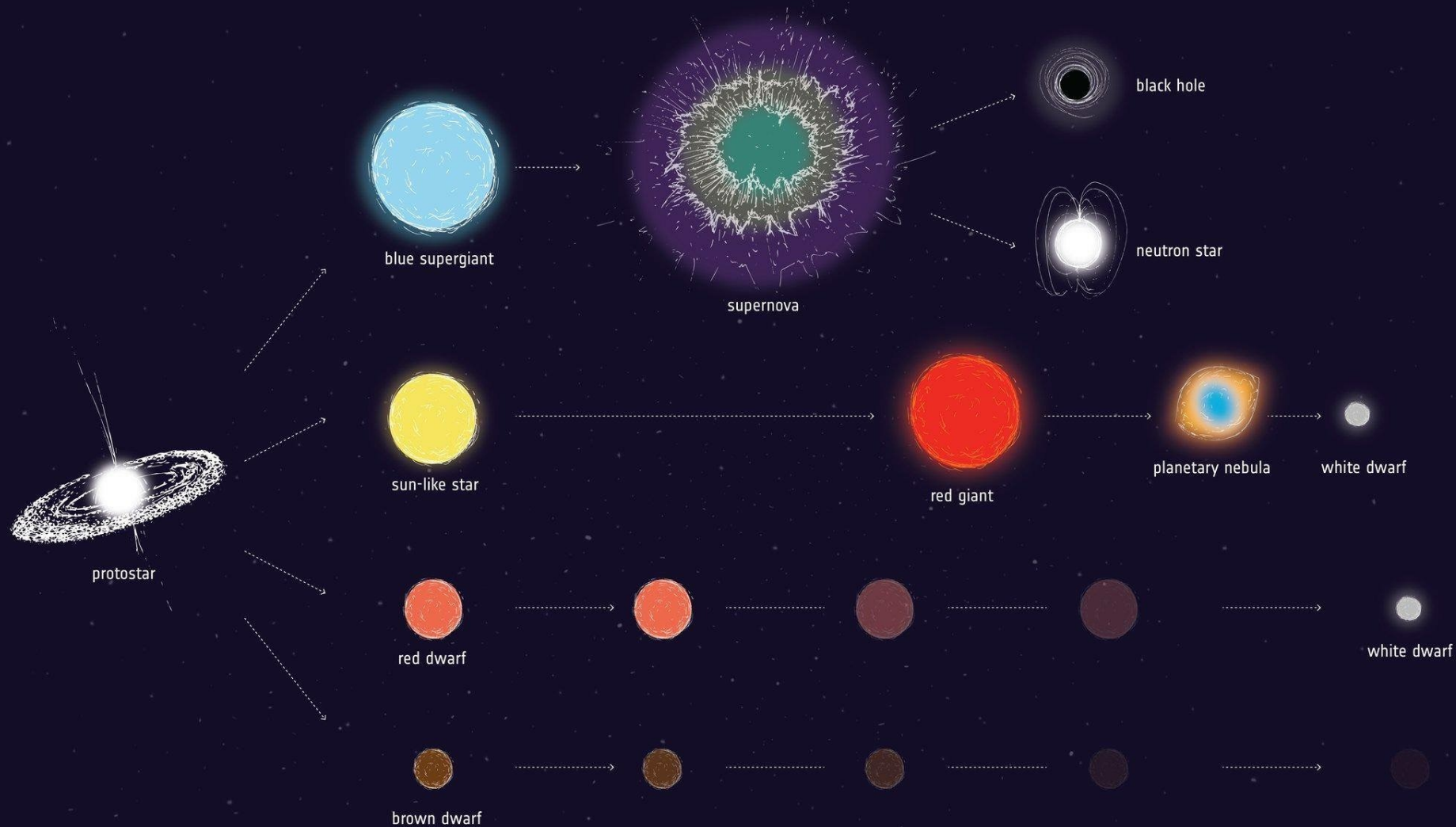
- Cassini's data still being analysed, this is from its infra-red camera, differing colours highlighting different materials
- Brown area likely dune fields, blue/purple may be water ice

Crystalline Stars

- As White Dwarves near the end of their lives they begin to crystallise out
 - long held theory now supported by direct evidence from ESA's Gaia satellite
- Despite being at extremely hot temperatures the oxygen and carbon atoms are under intense pressures resulting in crystallisation
- result - spheres of solid oxygen and carbon
 - like water turning into ice, but at 10 M degrees!
- The Sun will end up a crystal star in 10 B years
- Diamond cored husks?

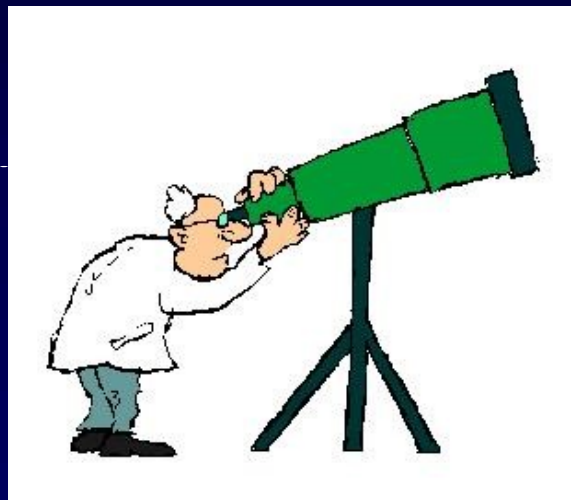


Lives of Stars



What's Up!

For February 2019
(and remainder of January)



BROOKLANDSRADIO

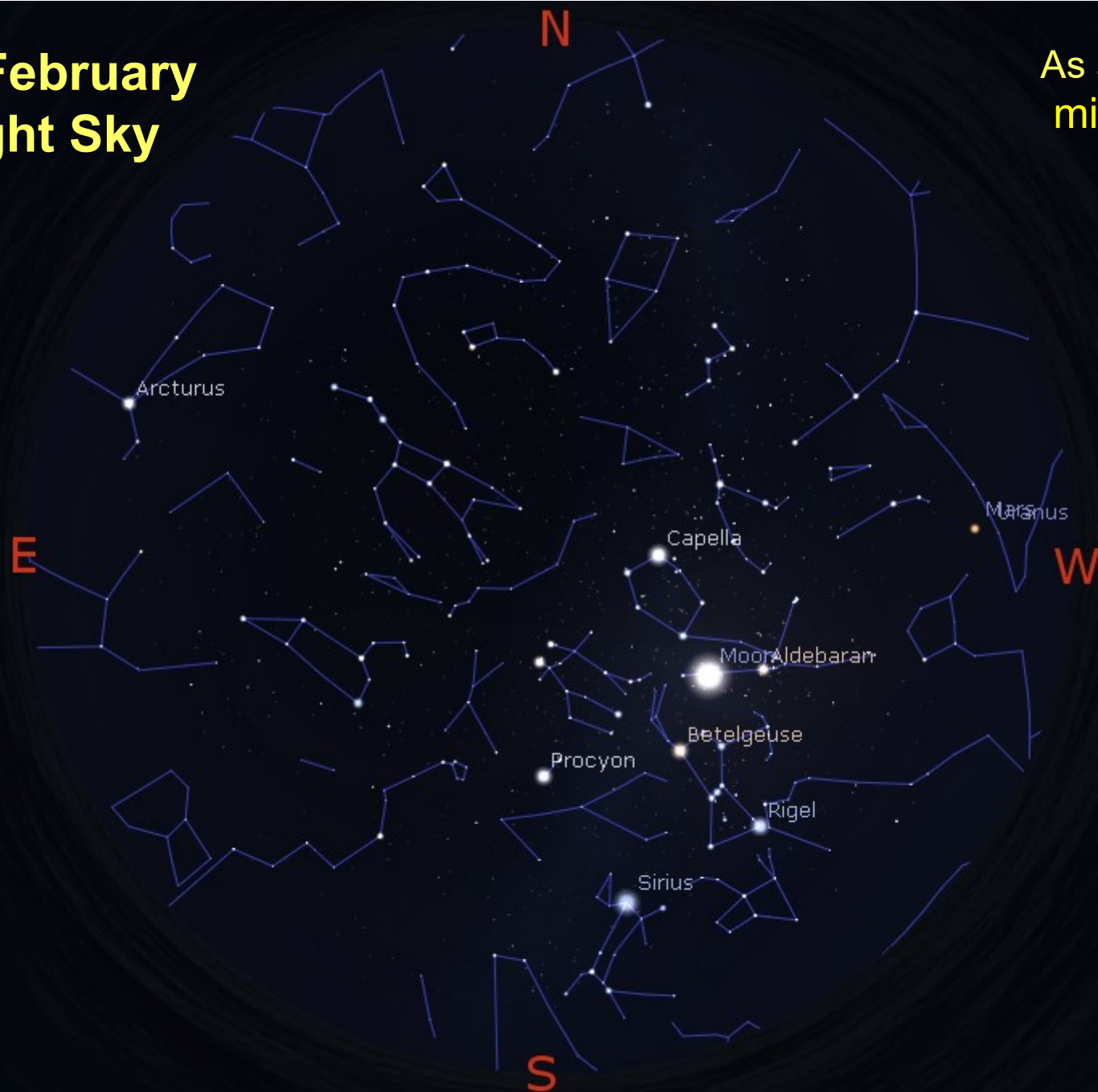
ONLINE

The Sound of Surrey



The February Night Sky

As at 10 p.m.
mid-month



The Moon in February



What's Up - Planets

- Mercury

- An evening object in West at mag -1.0, visible from mid-month onwards, setting about 1½ hrs after sunset.

- Venus

- A brilliant morning object at mag -4.0 but very close to the SE horizon, rising about 1½ hrs before sunrise.

- Mars

- Still a good evening object in the South Western skies throughout the month. Decreasing in brightness as the month draws on and the planet recedes from us, finishing the month at mag +1.2, in Aries.

What's Up - Planets

- Jupiter

- A bright morning object, low in the South East, rising about one hour before the Sun. Shining at Mag -1.7 so easy to find.

- Saturn

- Visible once again at mag -0.9, but low in SE 1 hr before sunrise.

- Uranus

- Visible all night at Mag +5.8, well placed in Pisces in South West






- Neptune

- Not easily visible, being low and disappearing into the evening twilight, Mag +7.9 in Aquarius, low in SW

Phenomena in January

- **1st** Venus close to the waning crescent Moon, 05.00 hrs
- **2nd** Nice line up of Venus, Moon, Jupiter, Mercury
 - from 5 a.m. to 7.30 a.m.
- **3rd/4th** Peak of Geminids meteors, favourable Moon
- **12th** Mars just 6° north of crescent Moon
- **13th** Saturn & Mercury 1.8° apart, 20 mins before sunrise
- **21st** Total Eclipse of the Moon, 04.41 hrs to 05.43 hrs
- **22nd** Venus & Jupiter just 2.5° apart, 05.45 hrs low in SE
- **31st** Venus, crescent Moon & Jupiter close together in dawn sky, low in SE from 5.30

Phenomena in February

- **1st** Venus & Jupiter close to the waning crescent Moon, from 06.15 hrs, Saturn joins from 07.00 hrs 
- **2nd** Moon rises occulting Saturn, which reappears from dark limb at 06.30 hrs. NB exceeding low and in SE only 
- **5th** Venus just 2° north of Triffid Nebula, M20 
- **10th** Venus just 2° south of open cluster M25 
- **18th** Venus just 1° north of Saturn 
- **28th** Waning crescent Moon 7° from Jupiter

Meetings at Local Societies

- **Guildford AS** *Lecture Theatre L, Uni of Surrey*
 - Thursday 7th February, 7.30 p.m.
 - **The Antikythera Mechanism**
 - » John Lancashire

Meetings at Local Societies

- **Farnham AS Aldershot Cricket Club**
 - Tuesday 12th February, 7.45 p.m.
 - **Star Theatres: A History of The Planetarium**
 - Laurence Anslow
 - » Farnham AS

Meetings at Local Societies

- **Croydon AS** *Royal Russell School, Coombe Lane, Croydon*
 - Friday 8th February, 19.45 hrs
 - **How To Catch A Star**
 - Pamela Breda
 - Friday 22nd February 19.45 hrs
 - **Thermonuclear Fusion In Stars**
 - Mark R. Smith FRAS

Meetings at Local Societies

- **Ewell AS** *Nonsuch High School for Girls, Cheam*
 - Friday 8th February, 19.45 hrs
 - **From Eyepiece to Journal - The Information Journey**
 - Stephen
 - » Ewell AS

University of Surrey

- **Department of Physics**

- Wednesday 20th Feb
19.00 hrs

- Lecture Theatre D

- **Talk**

- title & speaker tbc

- **Stargazing (if clear)**

- or

- **Night Sky Talk**

- Free event, but booking required, via web site

- **Astronomy Evenings**



Astronomy on TV

- **The Sky at Night**

- *Cosmology In Crisis?*

- Ever since we discovered that distant galaxies are racing away from us, there has been a huge undertaking to calculate how fast the Universe is expanding. Two very different viewpoints have emerged. The Sky At Night team meet leading astronomers and cosmologists on both sides of the debate. Which team has the right answer? Could both be right?

Sunday 10th February BBC 4, 10.00 pm

Thursday 14th February BBC 4, 7.30 pm

for exact times please check www.radiotimes.com



"That's all Folks!"