

Stars Over Surrey

Astronomy & Spaceflight News

28th June 2019



Variety | Personality | Companionship

MSSL Plans New Comet Mission

- ESA has selected an MSSL proposal for launch in 2028
- Comet Interceptor will lie in wait at L2 Lagrange point then ambush a suitable comet, once discovered
 - target is hoped to be pristine, from the Oort Cloud
- Intent is to learn more about circumstances pertaining to formation of Solar System, 4 BY ago
- Mothercraft will have camera, science instruments, propulsion & communication systems
- Two daughter craft - own sensors
 - one built by ESA, one by JAXA



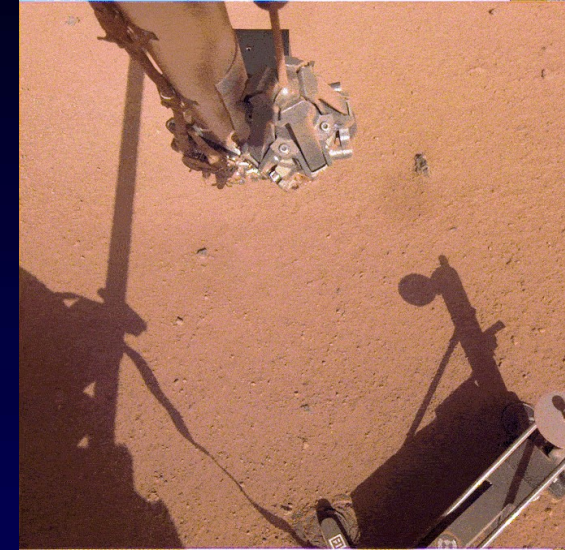
VLT tracks pass by Double Asteroid

- ESO's Very Large Telescope successfully tracked and imaged pass by binary asteroid
 - 1999 KW4 passed approx 3.2 M miles on 25 May, at 48,000 mph
 - image at top, artist's impression below
 - diameter 0.8 mile (larger object)
- Part of test run by International Asteroid Warning Network
 - developing techniques for detecting, assessing potential threats and considering deflection countermeasures
- Similar to target of NASA's proposed DART mission



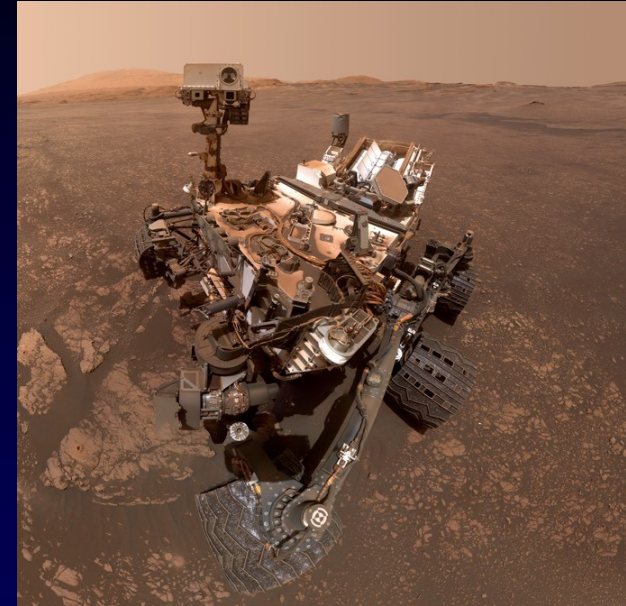
NASA plans for stuck Mars probe

- Insight's mole got stuck in Feb after travelling just one foot into Martian soil
- Following experiments with replica instruments and sandpits they believe they know the problem
- Its design assumed that Martian soil would flow round it, gripping it and preventing it bouncing back with recoil
 - i.e. cavities have formed around mole, so there's no friction
- Next step is to use Insight's robotic arm to lift and place the support structure to one side
 - worry is that lifting might pull mole from hole
- After that the arm will press down around mole in attempt to compress the surface and fill cavities.



Curiosity Detects Methane

- NASA's Curiosity rover has reported the detection of the highest measure of methane during its mission
 - 21 ppbv (parts per billion by volume)
 - “With our current measurements, we have no way of telling if the methane source is biology or geology, or even ancient or modern” (NASA spokesman)
- Methane levels seem to fluctuate seasonally
- ESA's Trace Gas Orbiter still hasn't found any



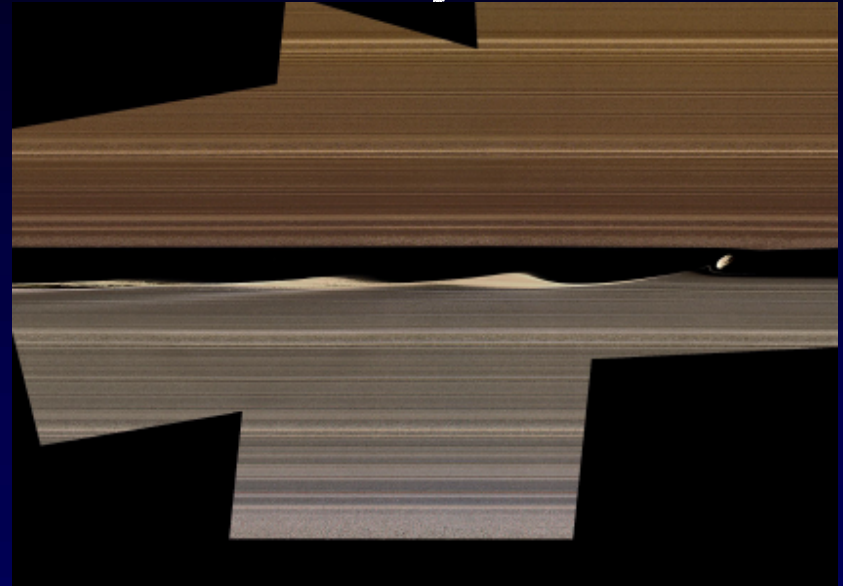
Other Mars related news

- Japan announces European involvement in its MMX mission to one of Mars's moons at last week's Paris Air Show
- The mission will carry a French-German built rover & deploy it onto either Phobos or Deimos (2024/5)
- NASA's Mars helicopter passes benchmark tests
- Video at <https://www.youtube.com/watch?v=VdRqSSYu4K8>

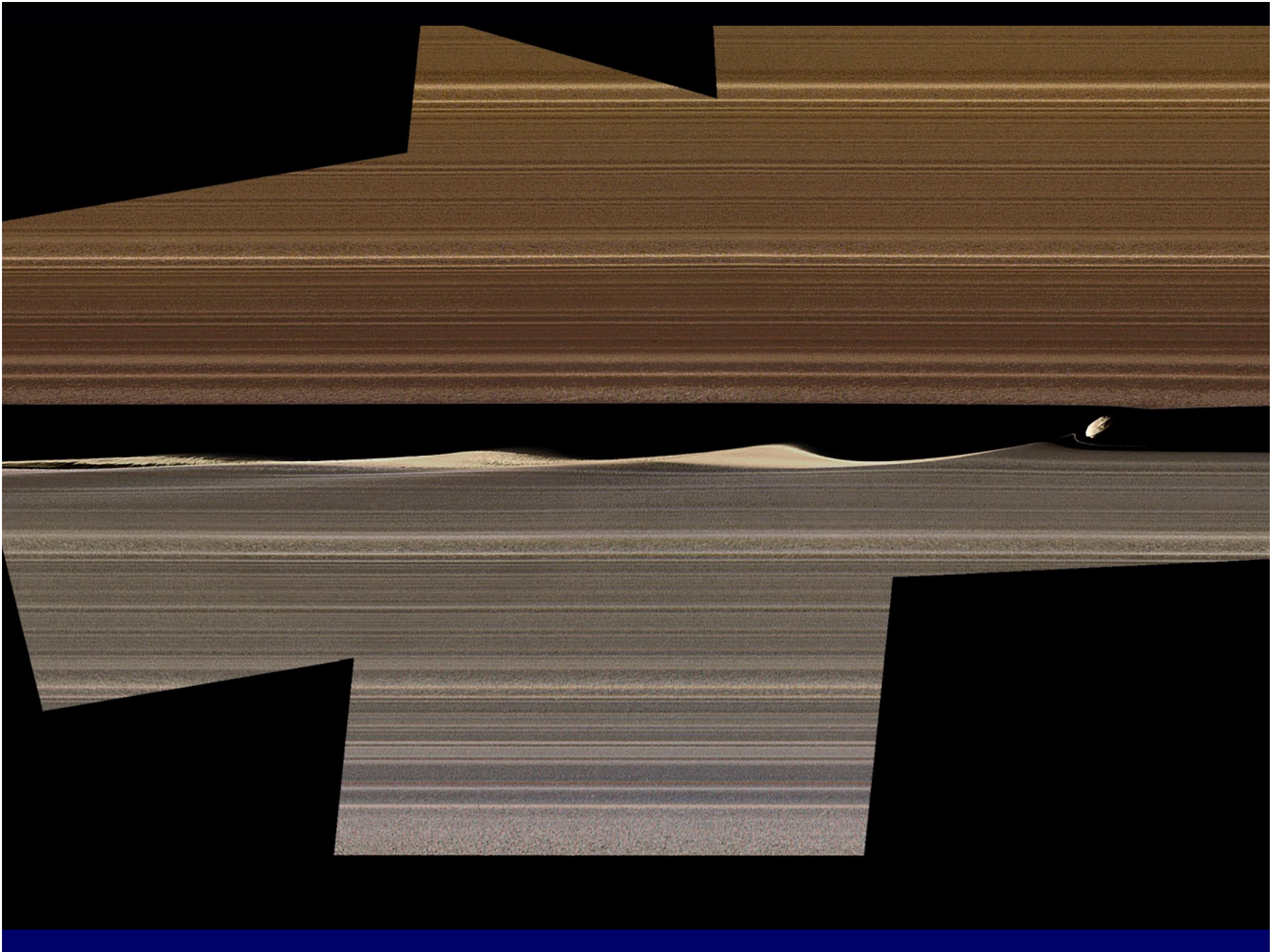


Cassini at Saturn - further analysis

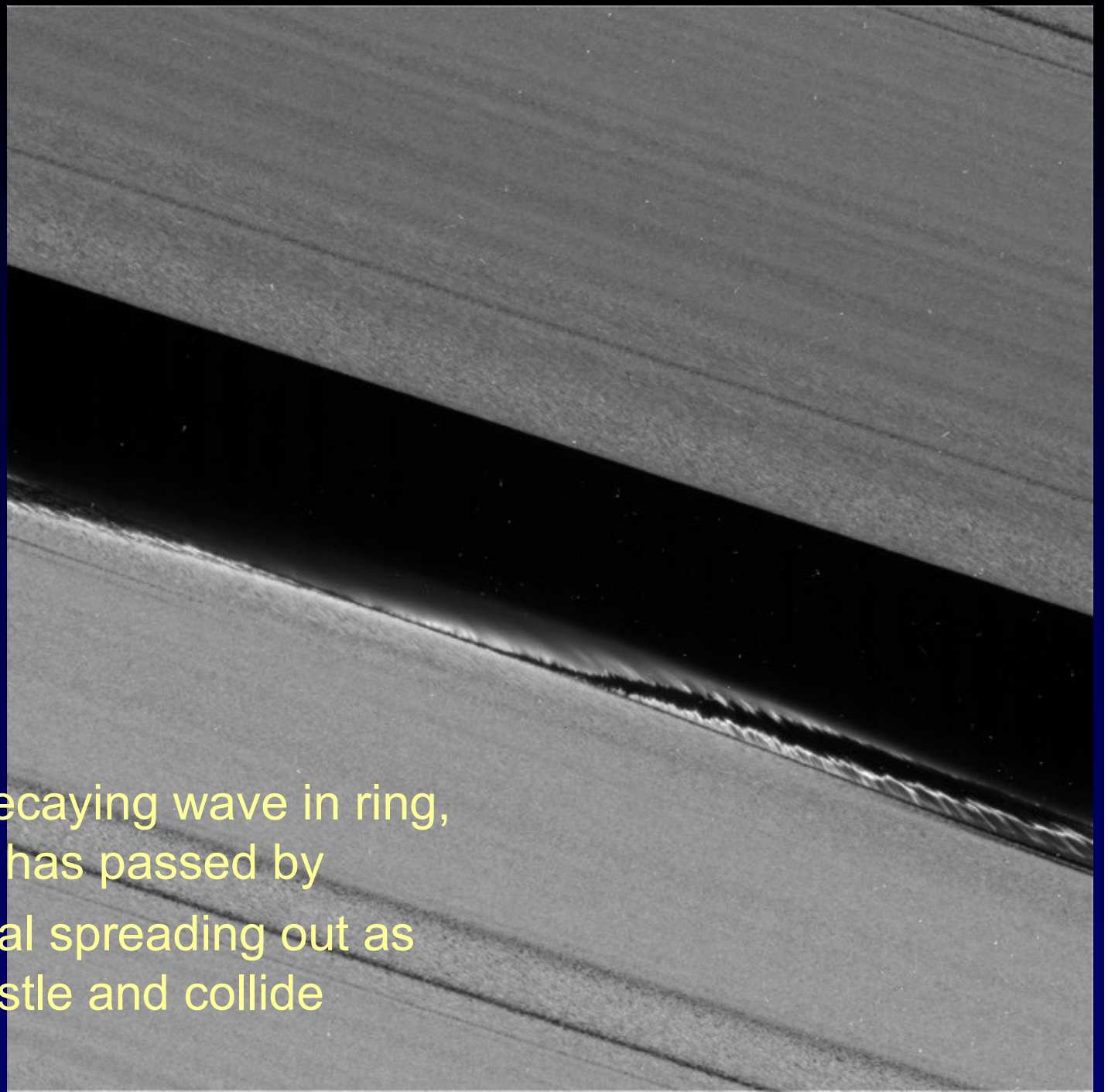
- A mosaic of earlier images has provided further detail about the interaction between some of Saturn's smaller moons and the ring system



- Here the moon Daphnis can be seen sculpting the ring material into wavelets
 - height of wave crests diminishes the further away from the satellite
- This gap it's cleared out is known as the Keeler gap
- The detailed analysis shows how thin strands of material spread out as the wave dissipate
 - useful for modelling the formation of planets from protoplanetary discs in early days of solar systems



- Close up of decaying wave in ring, after Daphnis has passed by
- Shows material spreading out as ice-crystals jostle and collide



Space MEN need not apply!

- A Barcelona research team has concluded that zero gravity does not affect human semen
- They propose that any missions in distant future should be crewed by female astronauts only, taking frozen sperm with them.
- This follows on from an earlier NASA paper that single-sex crews are better for cohesion in long-duration missions, and that women are preferable as they're more likely to co-operate
- That's it chaps - we're redundant!

Latest News In Brief

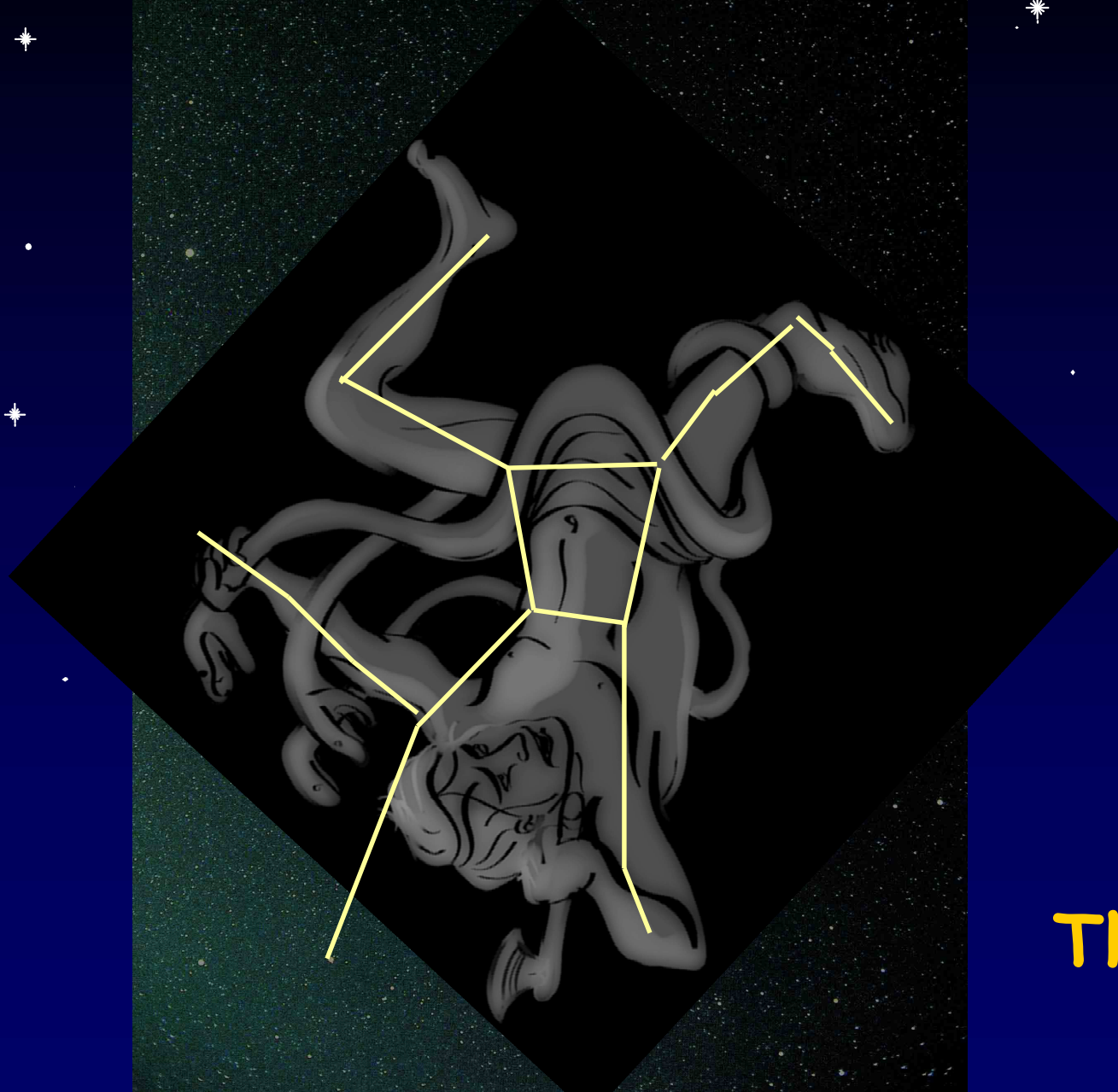
- Three astronauts landed safely Tuesday morning after 204 days aboard the ISS.
 - Lt Col Anne McClain: NASA
 - Cdr Oleg Kononenko: Roscosmos
 - David Saint-Jacques: Canadian Space Agency
 - Next crew launches on July 20th
- Third flight Tuesday morning for Space X Falcon Heavy
 - first night launch, also first with deployment to 3 different orbits
 - both side boosters successfully landed back at Cape Canaveral
 - central core booster just missed drone ship
 - launched 24 satellites
 - including some for NASA
 - » atomic clock for navigation by spacecraft
 - a Light Sail developed by the Planetary Society

July's Suggested Constellation



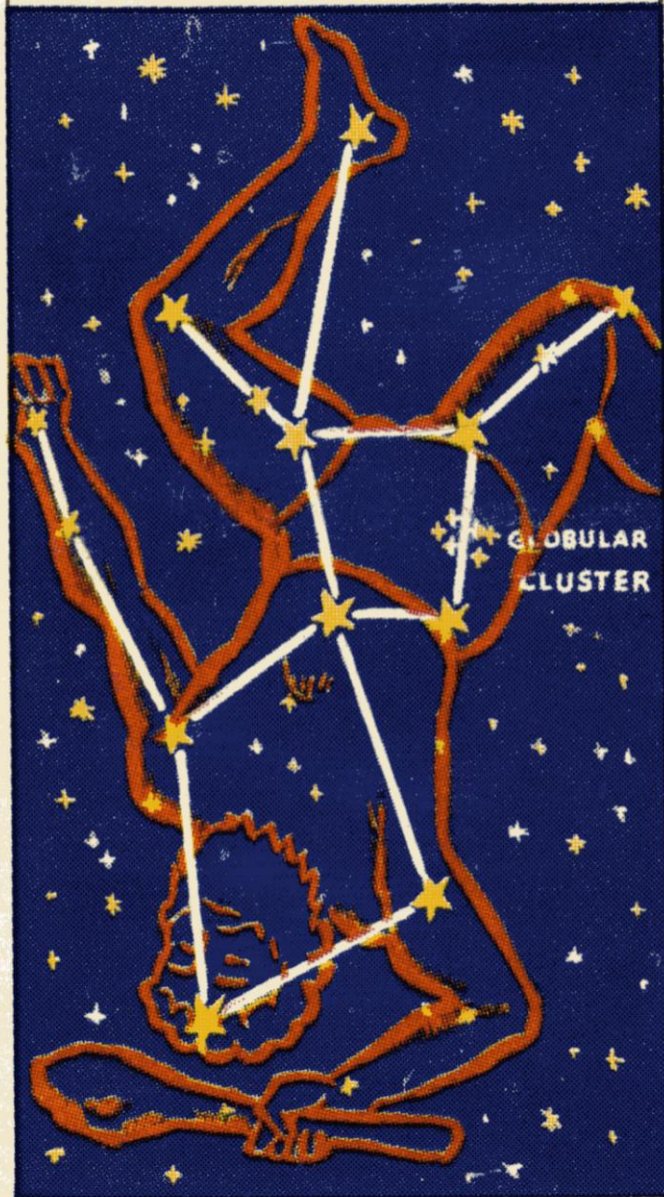
*Can you
tell what
it is yet?*

July's Suggested Constellation



That's right -
Hercules

HERCULES



A SERIES OF 50 No. 43

OUT INTO SPACE

*Approved by A. Hunter, Ph.D.,
Sec. Royal Astronomical Society*

HERCULES

This is a summer constellation and is best seen May to October. It is large and very interesting although containing no star of greater than 3rd magnitude; within it there are numerous double stars, clusters and nebulae. One great cluster is estimated to contain over 1,500 stars concentrated into a very small space in a roughly globular form, and has always been of intense interest to astronomers. Kneeling figure of Hercules, son of Jupiter, is seen upside down. This constellation was mentioned by Eudoxus (4th Century B.C.).

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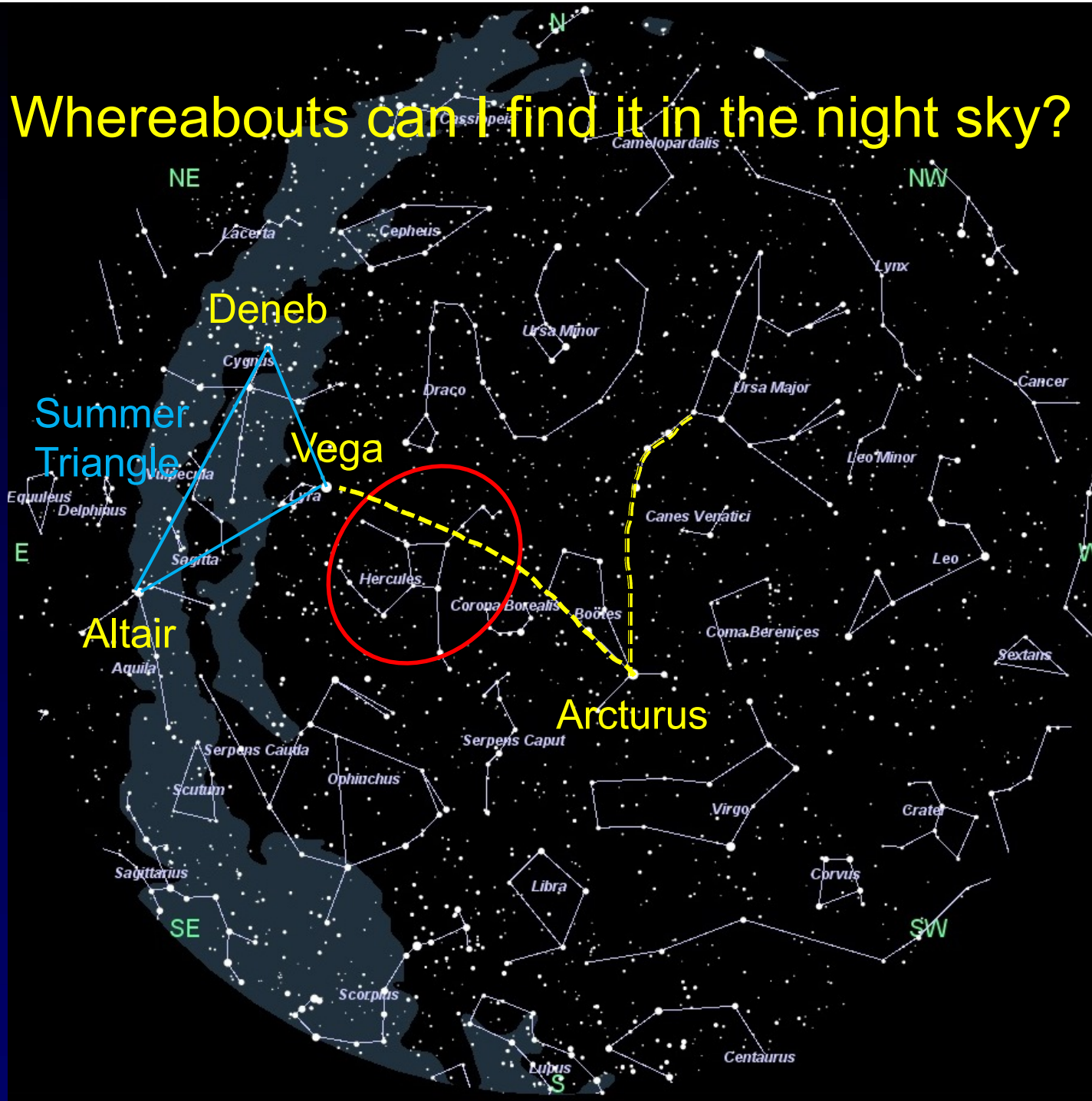
**ISSUED IN PACKETS OF BROOKE BOND
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Hercules

- Hercules is the fifth largest constellation, but perhaps not one of the best known, nor easiest to find.
- Best way to find it is to:
 - Make your way to bright orange/red Arcturus (the brightest star in Bootes) by following a line down from the tail of Ursa Major
 - Go up along the two stars marking Bootes's left hand side.
 - Follow this line and you should see bright blue-white Vega, one corner of the Summer Triangle
 - Hercules is half way between
 - The four main stars form "The Keystone"
- Hercules contains the northern hemisphere's best known globular cluster, M13, a marvellous sight even in a small telescope. Don't overlook M92, almost as impressive
- The constellation is also home to several really attractive double stars.

Whereabouts can I find it in the night sky?



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Hercules

Double Star
Mag 4.6 & 5.6



Messier Object:
M92 (globular cluster)

Messier Object:
M13 (globular cluster)

Double Star
Mag 2.9 & 5.5

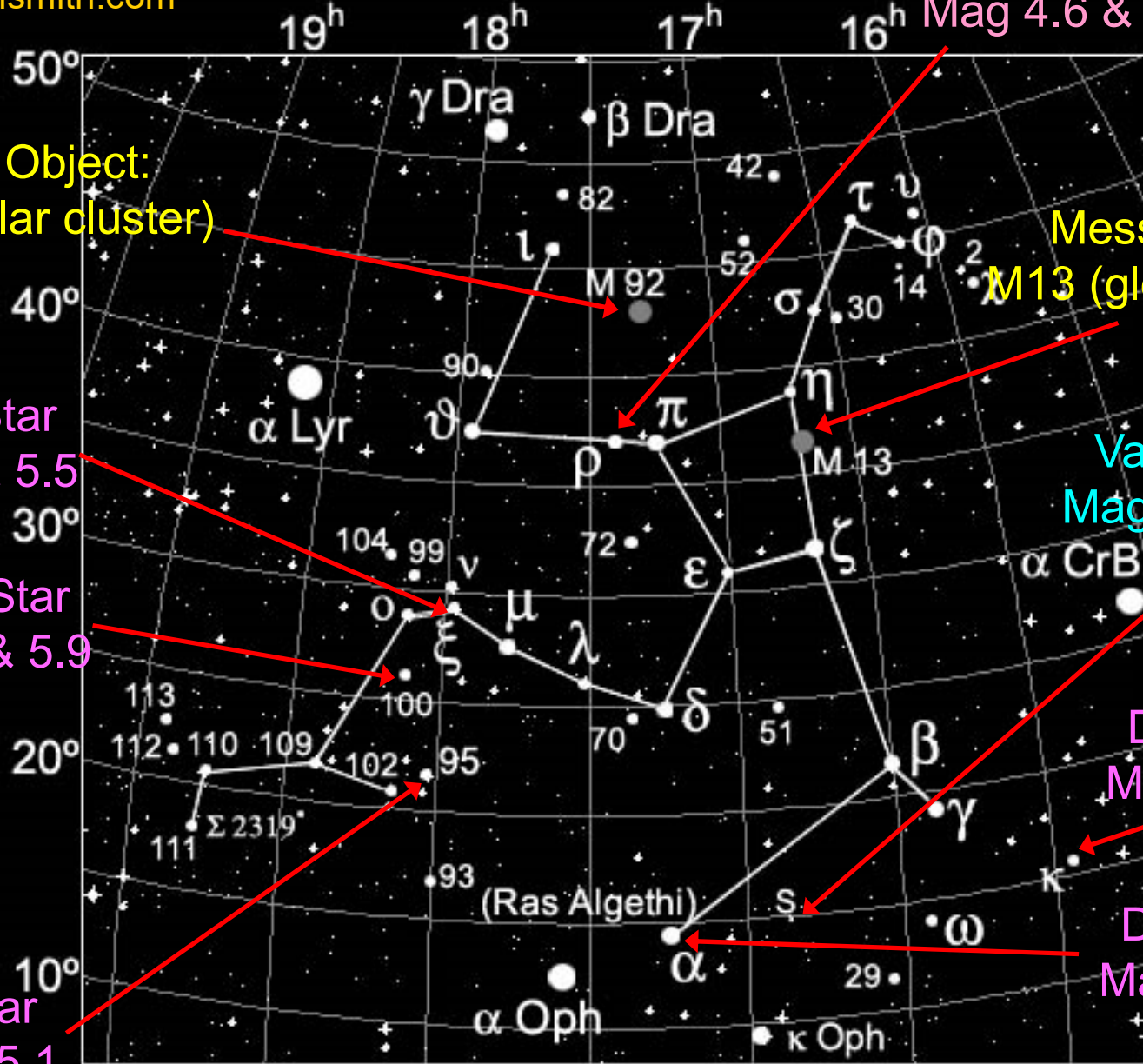
Variable Star
Mag 6.4 → 13.8

Double Star
Mag 5.9 & 5.9

Double Star
Mag 5.3 & 6.5

Double Star
Mag 5.0 & 5.1

Double Star
Mag 3.2 & 5.4



M13 (NGC 6205)



Distance 25,100 light years
Visual Brightness Magnitude 5.9

Apparent Dimensions 17 arc seconds
Discovered 1714 Edmund Halley

M92 (NGC 6341)

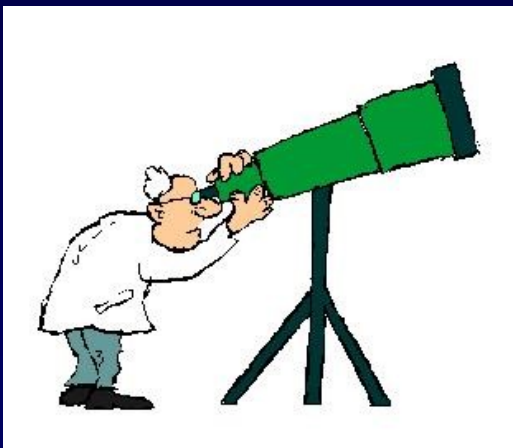


Distance 26,700 light years
Visual Brightness Magnitude 6.5

Apparent Dimension 11 arc seconds
Discovered 1777 Johan Elert Bode

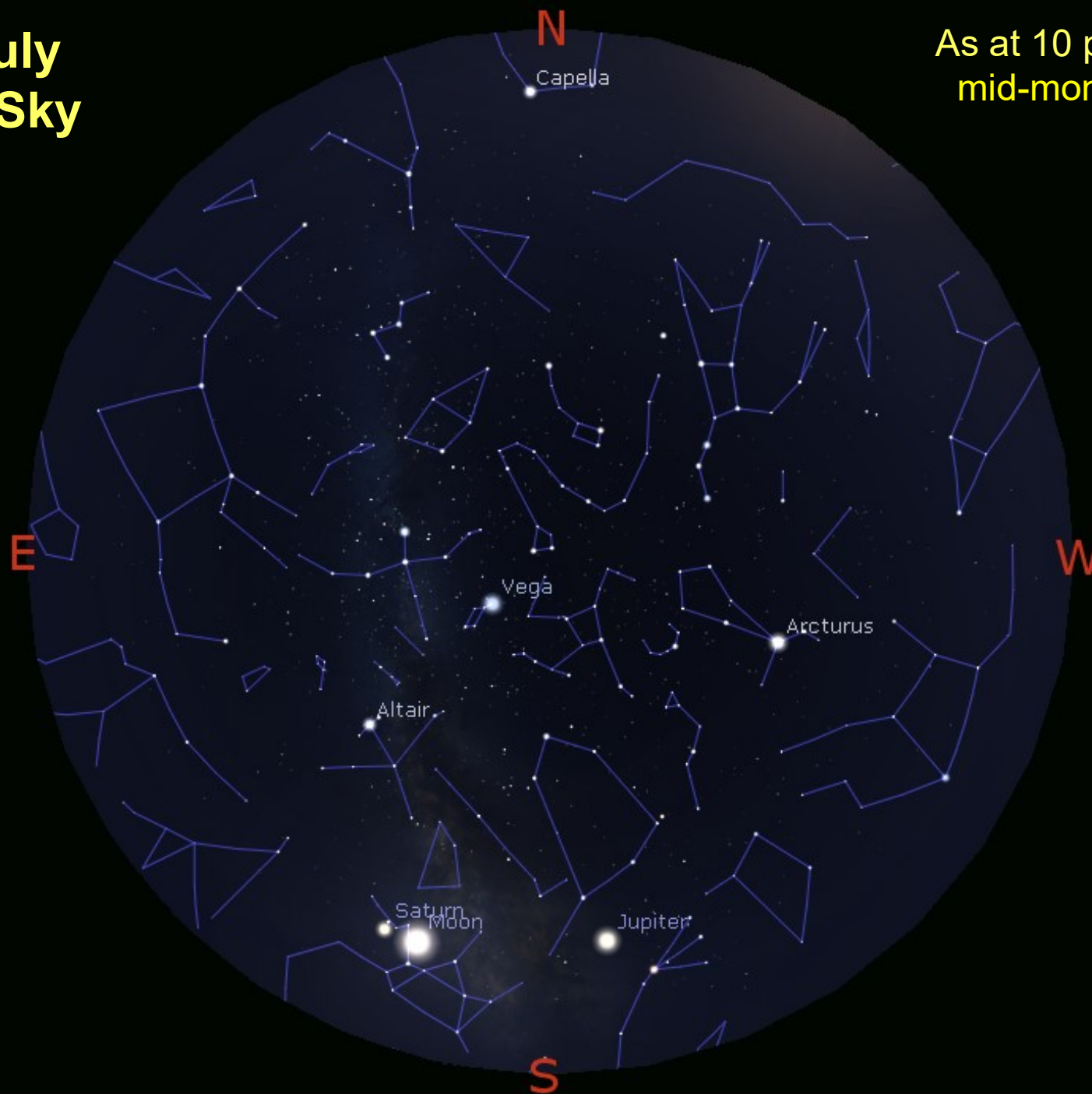
What's Up!

For July 2019



The July Night Sky

As at 10 p.m.
mid-month



Sun & Moon in July

- **New Moon** **2nd**
- **First Quarter** **9th**
- **Full Moon** **16th**
- **Last Quarter** **25th**

(BST)		Sun	Moon
1 st	Rise	04.50	03.43
	Set	21.21	20.04
15 th	Rise	05.03	20.18
	Set	21.12	04.27*
31 st	Rise	05.25	04.12
	Set	20.51	20.23

What's Up - Planets

- Mercury

- Can be seen as an evening object at the start of the month, setting soon after sunset. It becomes a morning object late in the month.

- Venus

- You might just see Venus about 30 mins before sunrise at start of month, very low (2°) in the North East, otherwise it's lost in Sun's glare for rest of month.

- Mars

- Not visible this month.

What's Up - Planets

- Jupiter

- Dominating the early night sky, the planet is very bright at mag -2.4 and is easily found, low in the South.

- Saturn

- A good evening object, at mag +0.5, in the South above the main stars of Sagittarius, at its best this month.





- Uranus

- Can be found in Aries in the morning sky, in East South East. Binoculars can find it at mag +5.8

- Neptune

- A morning object in Aquarius in the South South East, but telescopic at mag +7.9

Phenomena in July

- **3rd** A challenging trio low in North West - 1% lit thin crescent Moon close to both Mercury and Mars, just 4° apart, about 30 mins after sunset 
- **4th** Earth is at Aphelion, furthest point from Sun 
- **9th** Saturn is at opposition (opposite the Sun as seen from Earth). There is a noticeable brightening of the rings a few days either side of this date. 
- **13th** Gibbous Moon close to Jupiter
- **15 & 16th** Full Moon close to Saturn 
- **16th** Partial Lunar Eclipse. Moon rises at 9pm with Eclipse in progress. max Eclipse at 10.30, ends at midnight
- **29th** Maxima of Southern Delta Aquarid meteor shower, theoretical max of 18 per hour.

Noctilucent Clouds



All month, look in the North West & North up to 3 hours after sunset.
Ice crystals approx. 80 K high

Images courtesy of Rob Greaves



Images courtesy of Rob Greaves

Meetings at Local Societies

- **Guildford AS** *Lecture Theatre L, Uni of Surrey*
 - Thursday 4th July, 7.30 p.m.
 - » **AGM**
 - » Members Only

Meetings at Local Societies

- **Farnham AS Aldershot Cricket Club**

- Tuesday 9th July, 7.45 p.m.

- **“Galactic Bulges”**

- » Kevin Pretorious

- » Farnham AS

Meetings at Local Societies

- **Croydon AS** *Royal Russell School, Coombe Lane, Croydon*
 - Friday 5th July, 19.45 hrs
 - **Astrobiology: The Cradle of Life**
 - Prof. Nigel Mason OBE
 - » Uni of Kent
 - Friday 19th July, 19.45 hrs
 - **Parker Solar Probe Mission**
 - Dr Christopher Chen
 - » Queen Mary, Uni of London

Meetings at Local Societies

- **Ewell AS** *Nonsuch High School for Girls, Cheam*
 - Friday 12th July, 19.45 hrs
 - **Wonders of the Southern Sky**
 - Ian Morison

Astronomy on TV

The Sky at Night

“The Moon, the Mission & the BBC”

- To mark 50 years since the Moon landing the programme tells the story of how BBC reported on Apollo 11 at the time. Reporter James Burke recalls how he was given access to the Command Module for an episode of *Tomorrow's World* and the UK's first astronaut Helen Sharman reveals whether predictions about what life in space would be like have come true.

Sunday 14th July BBC 4, 10.00 pm

Thursday 18th July BBC 4, 7.30 pm

*for exact times please check www.radiotimes.com
or www.bbc.co.uk/skyatnight*

Astronomy on TV

- **The Planets**
- **Five weekly episodes, ending this week**
 - repeat is Sat. BBC2, 7.30
 - else iPlayer
- **Prof Brian Cox**
- **Episode 5**
 - **Into The Darkness - The Ice Worlds**
 - In the final episode, Professor Brian Cox journeys to the remotest part of the solar system, a place that the most mysterious planets call home.





"That's all Folks!"