

Stars Over Surrey

Astronomy & Spaceflight News

29th March 2019

BROOKLANDSRADIO

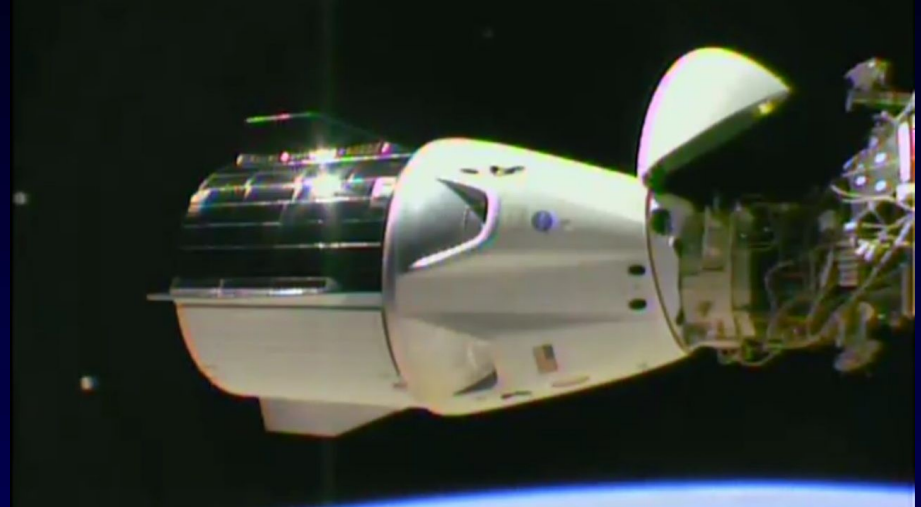
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The Sound of Surrey



Space X Crew Dragon Demo-1 Success

- Automated docking 27 hours after launch from Canavarell
 - Spacecraft approached, retreated as practice before actual docking.
 - ISS crew enter, test atmosphere and recover 450lb of cargo
 - having separated from capsule Falcon 9 booster executes Space X's 35th succesful landing, this one on the drone ship off Florida
 - capsule successfully landed under 4 parachutes in Atlantic
- Next test will use same capsule in launch escape test
 - rocket will launch Crew Dragon as per normal
 - emergency will be simulated at point of maximum air pressure and capsule will separate to demonstrate a safe emergency landing
- Two man flight in July/August to ISS



Boeing Hits Delays

- Boeing's StarLiner first unamanned demo flight was scheduled for April
- Now postponed until August
- First manned test flight to ISS now delayed until November
- Above reports according to Reuters from "unnamed industry sources"
 - NASA & Boeing declined to comment
 - official statement next week



NASA's SLS Hits Delays

- NASA has just had its launcher budget cut by US Government
- Implication is that its Space Launch System (SLS) can't be further developed to launch the 25 ton Orion capsule and Lunar Gateway module into Lunar Orbit
 - essential part of NASA's return to the Moon plans
- NASA now considering using two separate commercial launchers as substitutes
 - one for each unit, then dock in orbit.



Pence calls for Moon landing in 5 years

- Tues: Vice President Mike Spence has called on NASA to return to the Moon within five years
- Used phrases like “by any means necessary”, “a new urgency”, “our worst enemy - complacency”
- He mentioned over-bureacracy in NASA and challenged existing commercial partners to shape up or be replaced by others.
- NASA administrator Jim Bridenstine tweeted “We accept the challenge”



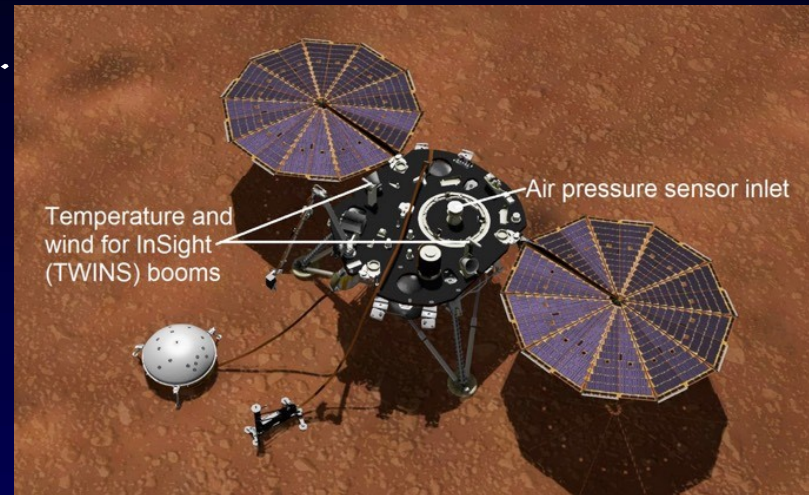
ISS news

- March 14th: Soyuz MS-12 docks with 2 NASA astronauts plus 1 Russian
 - include the 2 man crew of Soyuz MS-10 that aborted after launch last October
 - subsequent crew launches to ISS had to be rescheduled
 - ISS crew now back up to 6
- Plans thwarted for 2 NASA lady astronauts to perform the very first all female spacewalk
 - space suit size problem, only one “medium” on board ISS!
 - 2nd of 3 EVAs to replace external nickel-hydrogen batteries for solar power array with improved lithium ones.
 - one conducted on 22nd, an ongoing task which began in 2017
 - each lithium battery weighs 300lbs.



InSight runs into trouble on Mars

- Mole has temporarily abandoned descent
- after 4000 hammer strikes the mole hit a stone or gravel bed which it couldn't penetrate
 - only penetrated about 12" max
- two week suspension to allow consideration of how to overcome problem
- intention is to burrow down about 16 feet trailing a cable with temperature sensors connected back up to the lander
- Other main instrument, ultra-sensitive seismometer, working correctly.



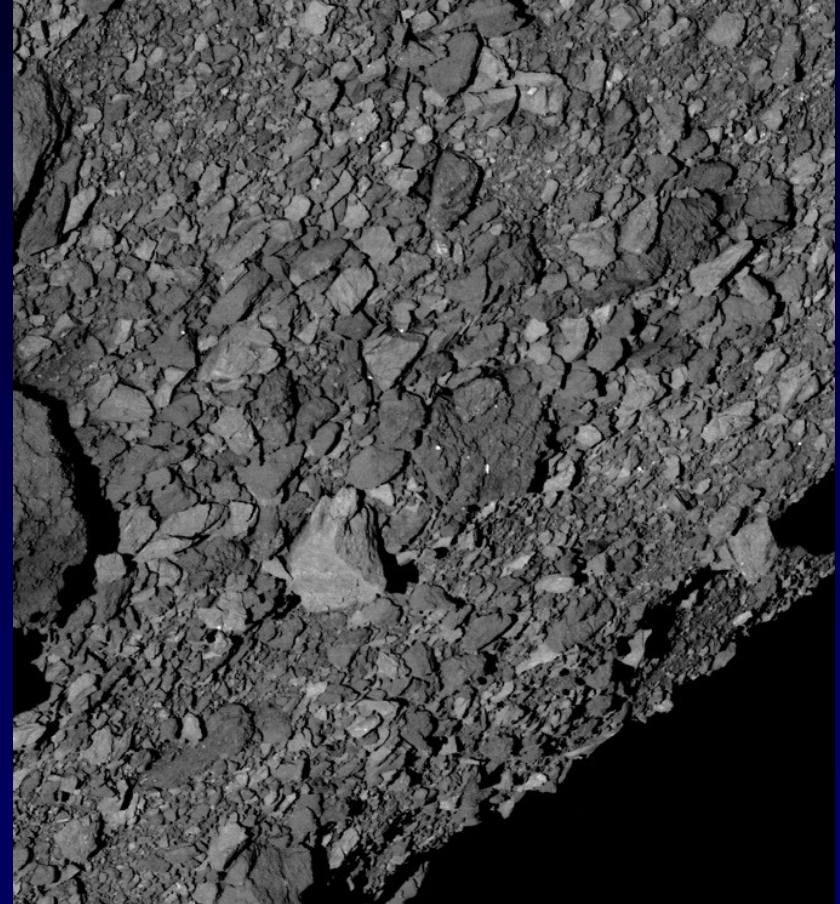
Latest news about Asteroid Missions - 1

- JAXA's Hayabusa2 is at asteroid Ryugu
- Its 'spinning top' shape suggests it once rotated faster than now
- Researchers believe that Ryugu splintered off from a larger parent body and reformed into its present shape
 - Two candidate bodies have been identified
- Ryugu seems to be lacking the hydrated materials observed by Osiris Rex at asteroid Bennu
- Next part of mission is to deploy Small Carry-on Impactor (SCI) to form a crater on the surface, study before and after images & collect sub-surface particles



Latest news about Asteroid Missions - 2

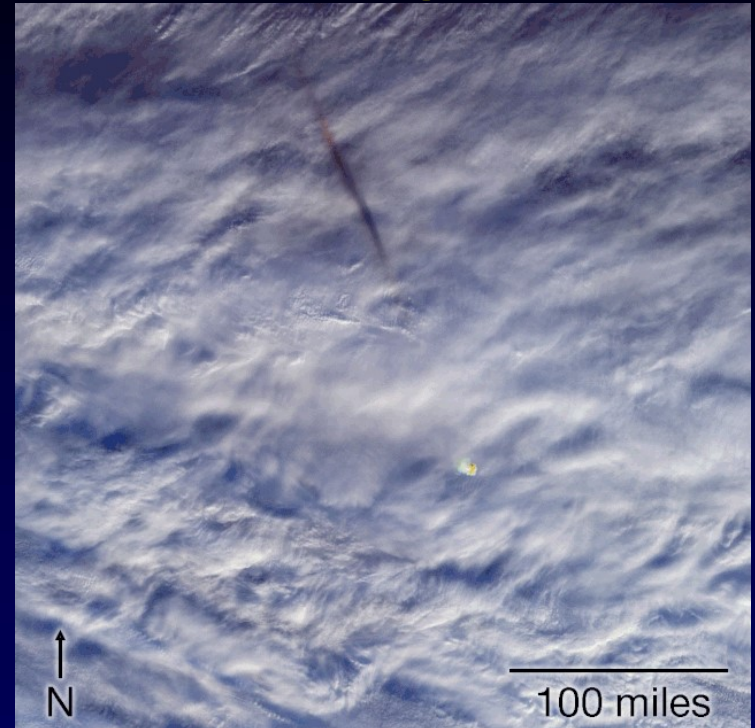
- NASA's Osiris Rex is at Bennu
- far more jumbled than expected
- flying rubble-pile!
- venting debris from its surface
 - rocks & pebble particle stream, probably propelled by outgassing from volatiles
 - size from 1 to 10 cm
 - some fall back, some go into orbit, some escape.





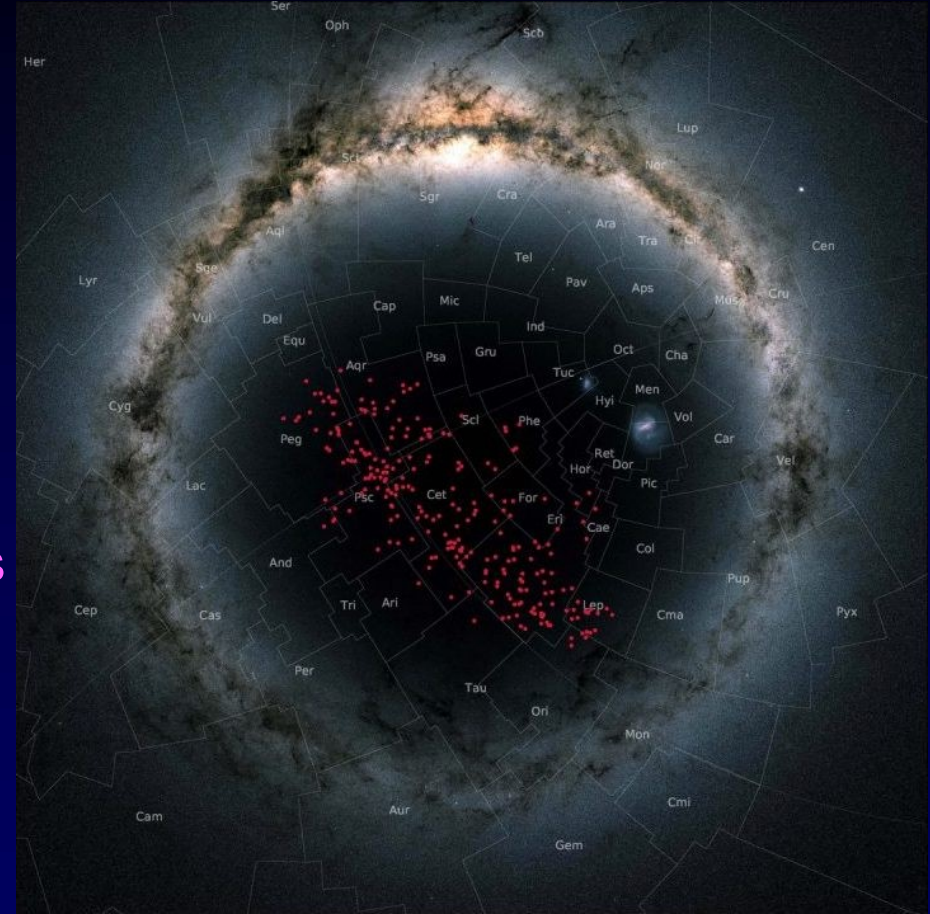
Small asteroid explodes over Bering Sea

- 2nd most powerful meteor explosion of the century
 - 173 kilotons
 - 10x A-Bomb
- This occurred on 18th Dec
 - 16 miles high
 - between Russia & Alaska
- No-one saw it!
- NASA weather satellite was found to have recorded it
 - shows meteor trail that took 10 mins to dissipate
 - mysterious yellow



Gaia Finds 'River of Stars'

- When open clusters form they begin to drift apart if there isn't a sufficiently strong gravity well to 'glue' them together
 - Milky Way's gravity stronger
 - resultant set of dispersed stars are called "stellar streams"
- There's such a stream nearby, only 300 LY away
 - so close we've been looking through it without realising!
- ESA's Gaia's precise measurements show these stars are moving at same speed, having formed about 1 B years ago
 - estimated 4,000 of them, crossing about 1/3 of the southern sky



Gaia data revises mass of Milky Way

- Gaia has been used to measure the precise movements of 34 of the globular clusters that surround the galaxy
 - distances up to 65,000 LY
 - Hubble also used on a further 12 clusters up to 130,000 LY
- By tracking the movements of these it's possible to calculate the total mass (both normal and dark matter) that has to be present to provide the observed acceleration
- Answer: MW = 1.5 trillion solar masses!



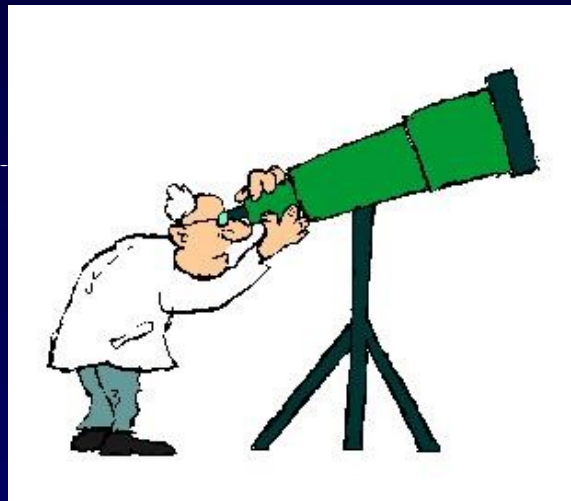
Speeding “cosmic cannonball” Pulsar

- NASA's Fermi gamma ray satellite has spotted a pulsar travelling at almost 2.5 million mph
 - so would cover Earth-Moon distance in 6 minutes!
- Its trail is 13 light years long
- Points back to the remnants of a supernova called CTB-1
 - this exploded about 10,000 years ago.
- It's thought that the SN explosion may have been uneven in some way, and so kicked the pulsar on its way



What's Up!

For March 2019



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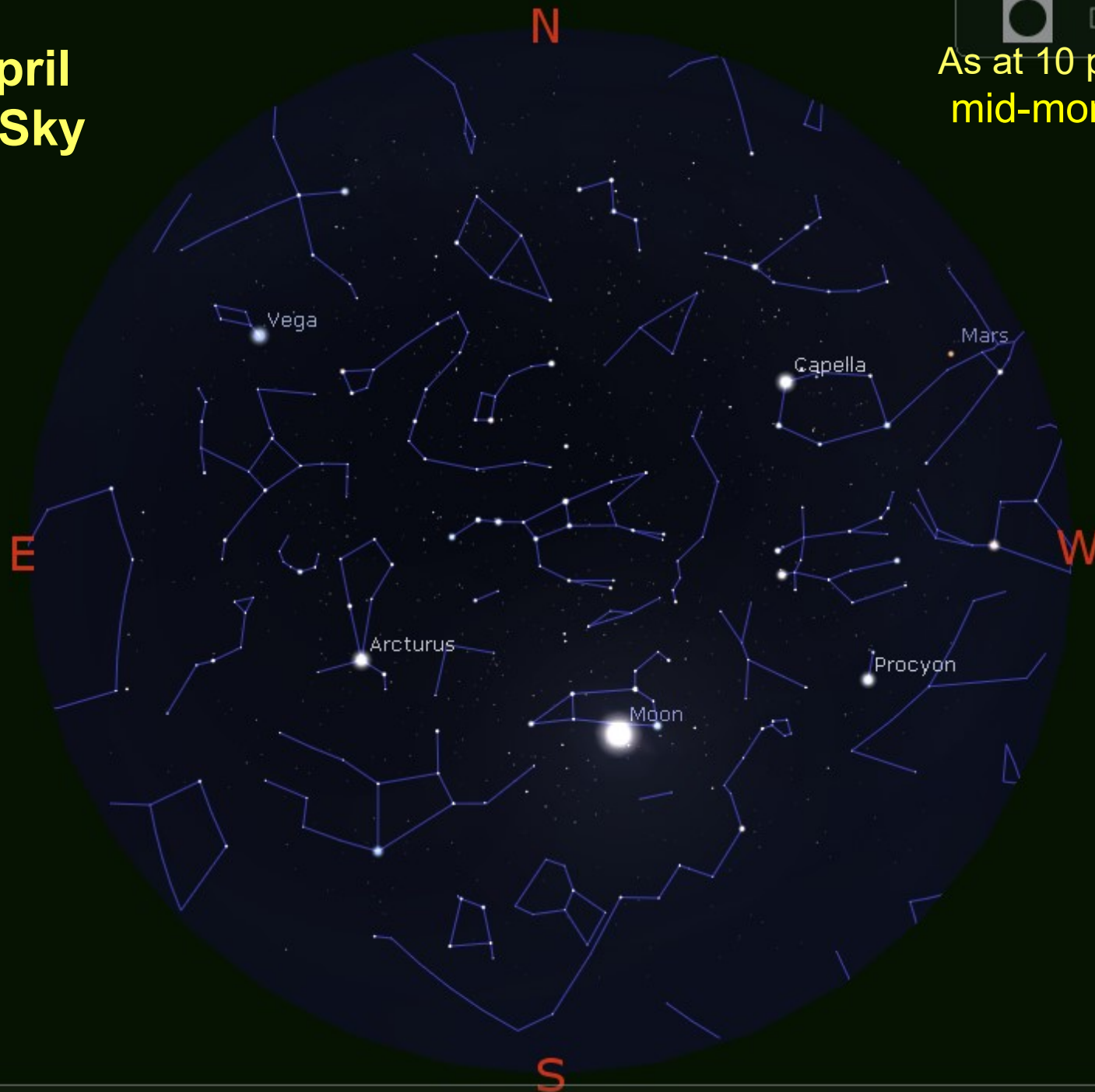
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The April Night Sky

As at 10 p.m.
mid-month



Ford, 0 m

FOV 190°

18.3 FPS

2019-04-15 22:01:11 UTC+00:00

Sun & Moon in April

- **New Moon** 5th
- **First Quarter** 12th
- **Full Moon** 19th
- **Last Quarter** 26th

(BST)		Sun	Moon
5th	Rise	06.27	07.02
	Set	19.40	19.44
15th	Rise	06.05	14.36
	Set	19.57	04.47
25th	Rise	05.44	01.53
	Set	20.14	10.00

What's Up - Planets

- Mercury

- Not well placed this month, but can be spotted about 2° above eastern horizon, just before sunrise.

- Venus

- A brilliant morning object at mag -3.9 but very low in the ESE, rising about 1 hr before sunrise at start of month, less than $\frac{1}{2}$ hr by end.

- Mars

- Still a good evening object in Taurus throughout the month, despite fading as it recedes.

What's Up - Planets

- Jupiter

- Rising by 01.00 hrs by mid-month, best seen around an hour later in the South . Very bright at mag -2.3.

- Saturn

- Another morning object, mag +0.6, best seen low in South South East about an hour before sunrise.




- Uranus

- Not visible this month

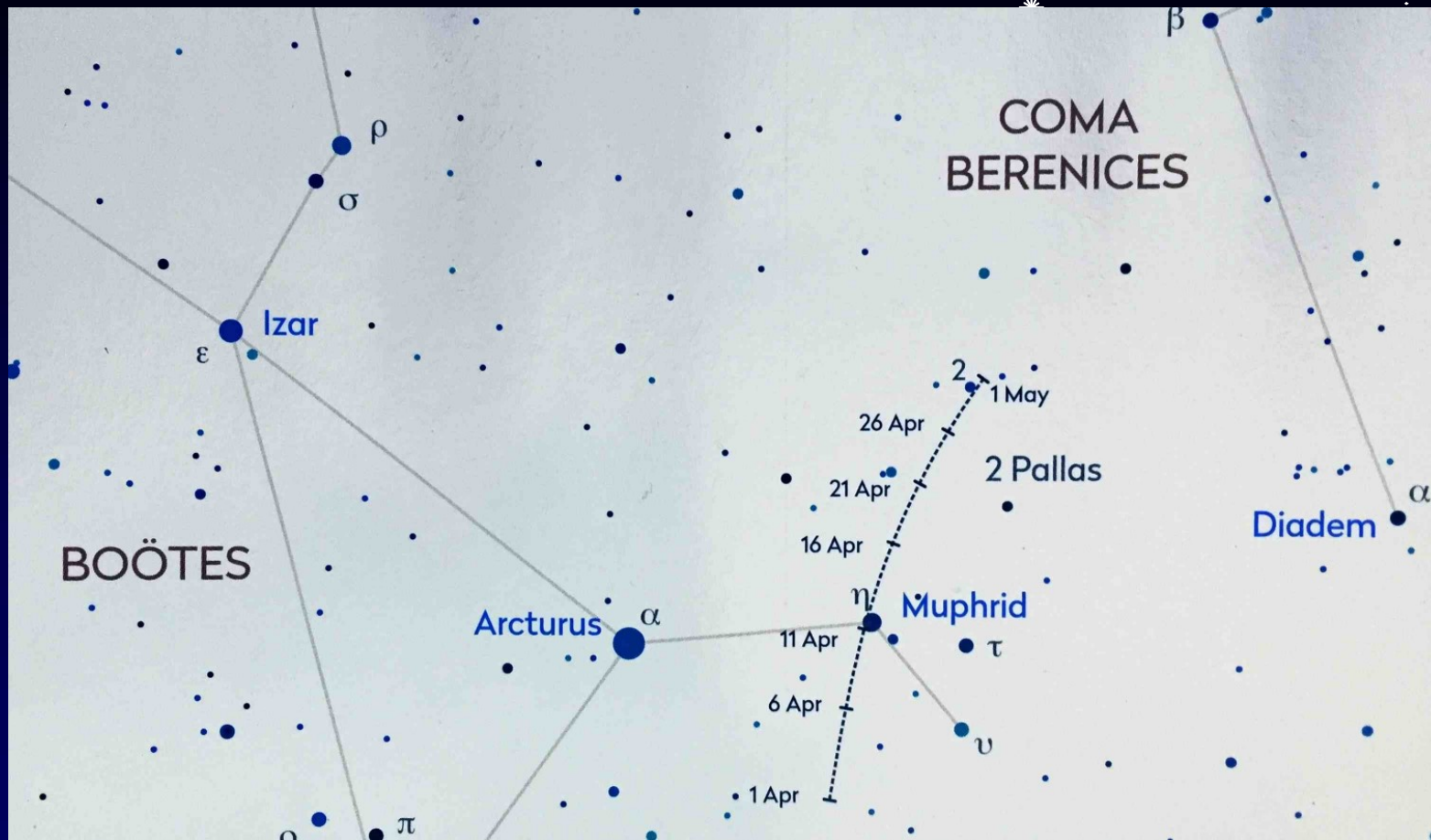
- Neptune

- Not visible this month

Phenomena in April

- **1st** Mars is 3° south of M45 Pleiades
- **2th** Thin waning crescent Moon, Mercury and Venus all close together just before sunrise, low in east 
- **16th** Mercury & Venus just over 4° apart, low above eastern horizon before sunrise 
- **22nd** Max of Lyrid meteor shower, theoretical max of 18/hour, but bright Moon will washout fainter meteors
- **25th & 26th** Saturn close to Moon before dawn; approx 6° to the west, then 6° to the east, respectively 
- **All month** Asteroid Pallas passes through lower part of Boötes

Minor Planet 2 Pallas



- **Visual**

- at mag 7.9 a telescope or good binos needed (10x50)
- try sketching the stars seen on different nights.

- **Photographic**

- take long exposure pics of same area on successive nights
- compare to see apparent motion
- use software to align and layer

Meetings at Local Societies

- **Guildford AS** *Lecture Theatre L, Uni of Surrey*
 - Thursday 4th April, 7.30 p.m.
 - **Lunar Imaging**
 - » Dr David Arditti
 - » West of London AS

Meetings at Local Societies

- **Farnham AS Aldershot Cricket Club**

- Tuesday 9th April, 7.45 p.m.

- **The Stars of Spring**

- Rory Fenner

- » Farnham AS

- **William Herschel**

- John Vines

- » Farnham AS

Meetings at Local Societies

- **Croydon AS** *Royal Russell School, Coombe Lane, Croydon*
 - Friday 5th April, 19.45 hrs
 - Subject & Speaker - to be announced
 - Friday 26th April, 19.45 hrs
 - Subject & Speaker - to be announced

Meetings at Local Societies

- **Ewell AS** *Nonsuch High School for Girls, Cheam*
 - Friday 12th April, 19.45 hrs
 - **Cosmology**
 - Sarah Hutton

Astronomy on TV

The Sky at Night

“Marsquake”

Little is known about what's going on below the surface of Mars, but answers may soon be coming via NASA's latest mission; InSight. It aims to peer into Mars' interior, learn about how the red planet formed, and why it's different from Earth. The Sky At Night brings us the latest news from the mission and bids farewell to Opportunity rover, which transformed our view of Mars.

Sunday 14th April BBC 4, 10.00 pm

Thursday 18th April BBC 4, 7.30 pm

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



"That's all Folks!"