

# Ursa Minor

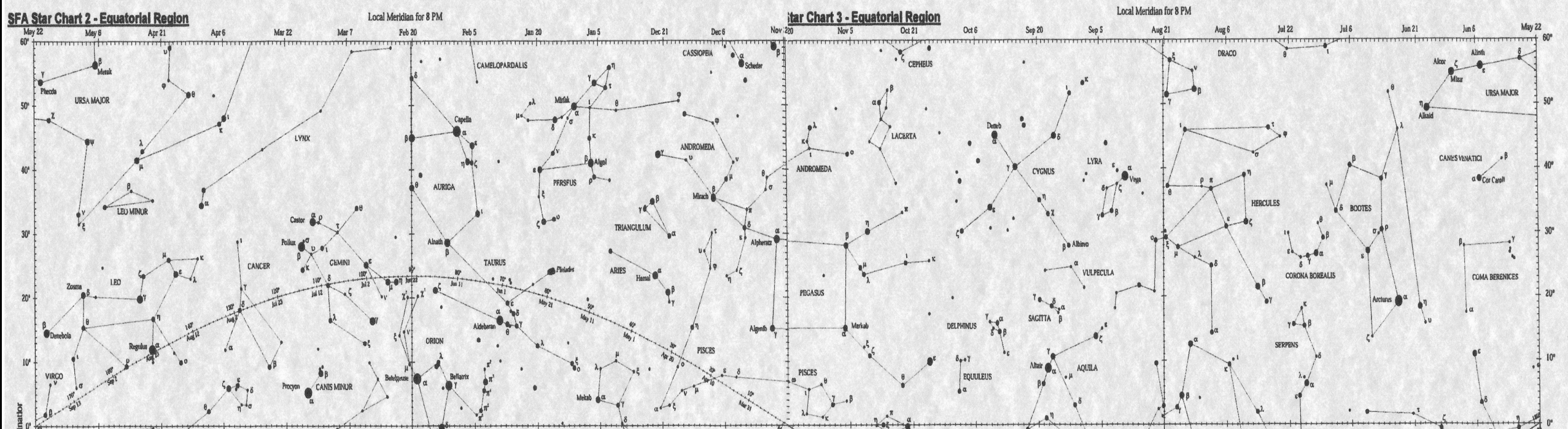
# Cepheus

# Draco

# Ursa Major

# Cassiopeia

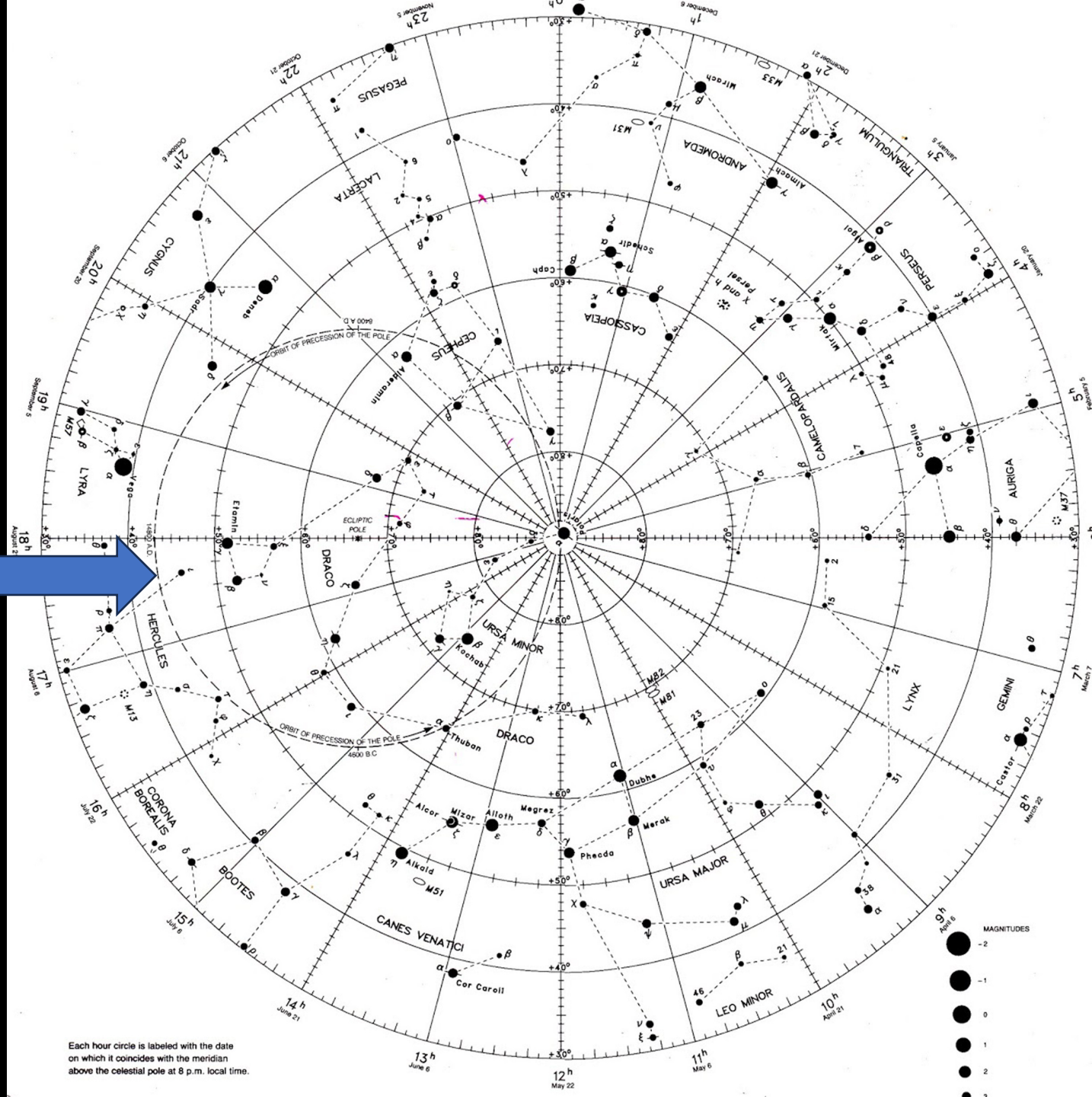
# Ursa Major



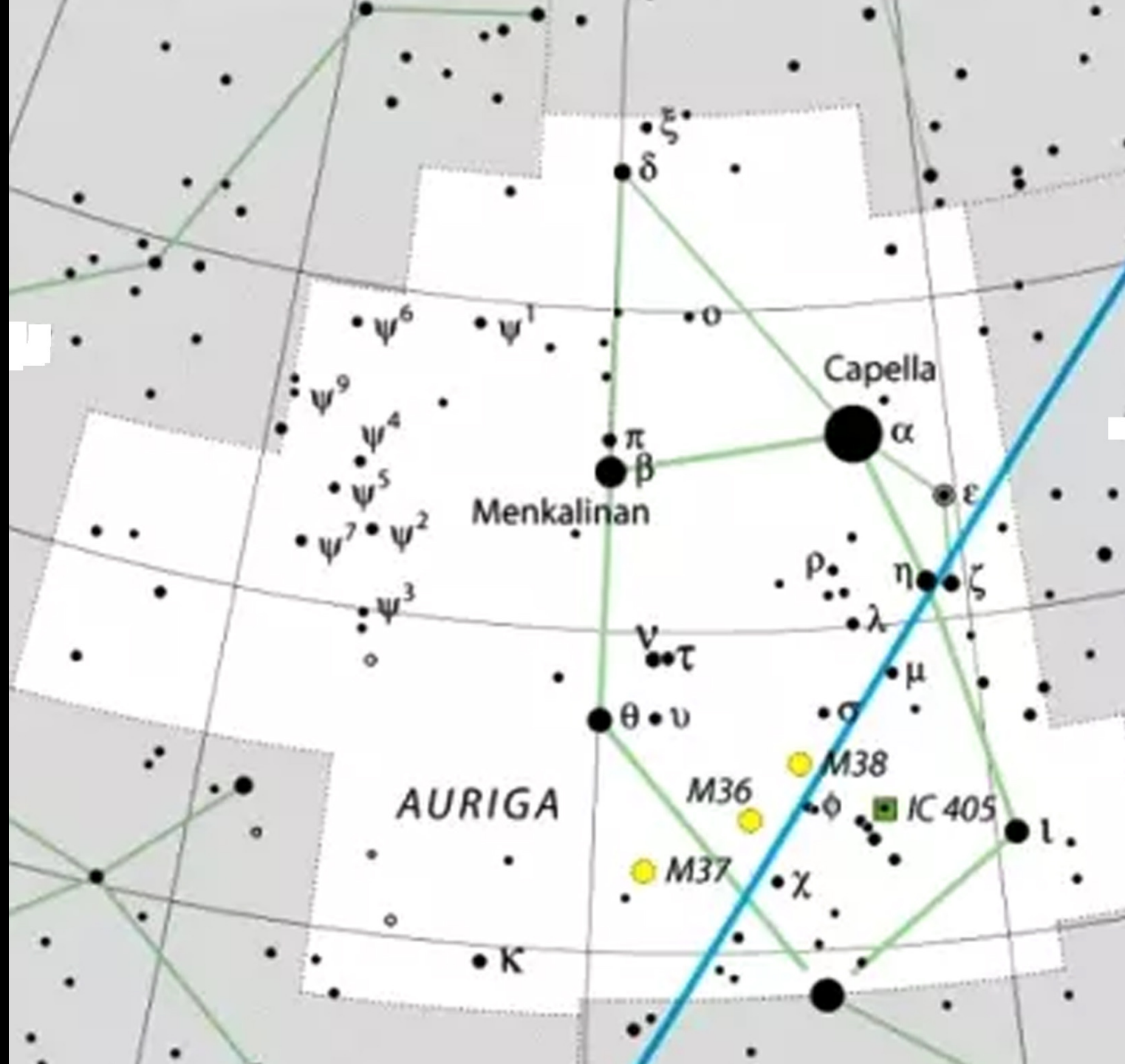


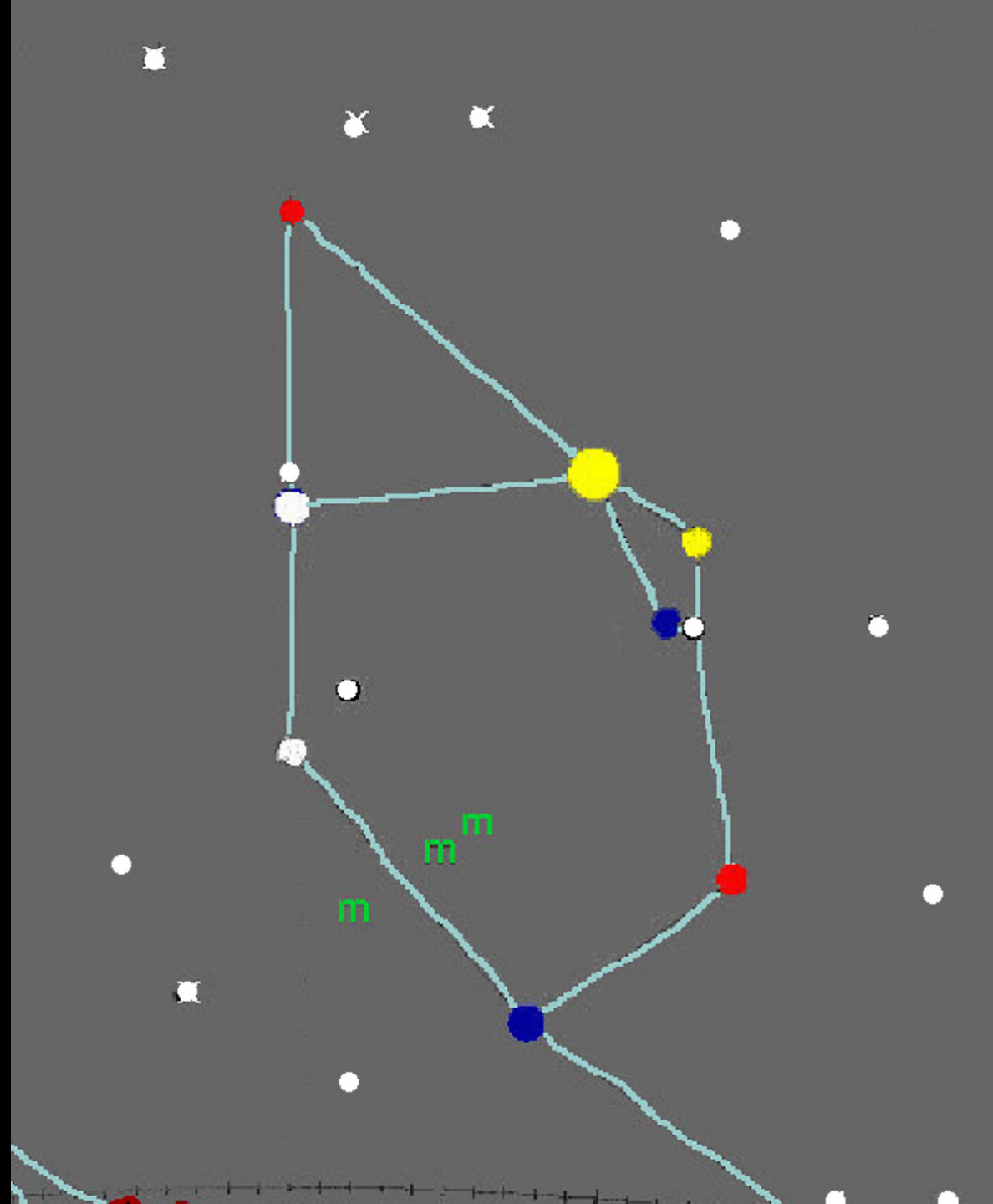
# North Circumpolar Constellations

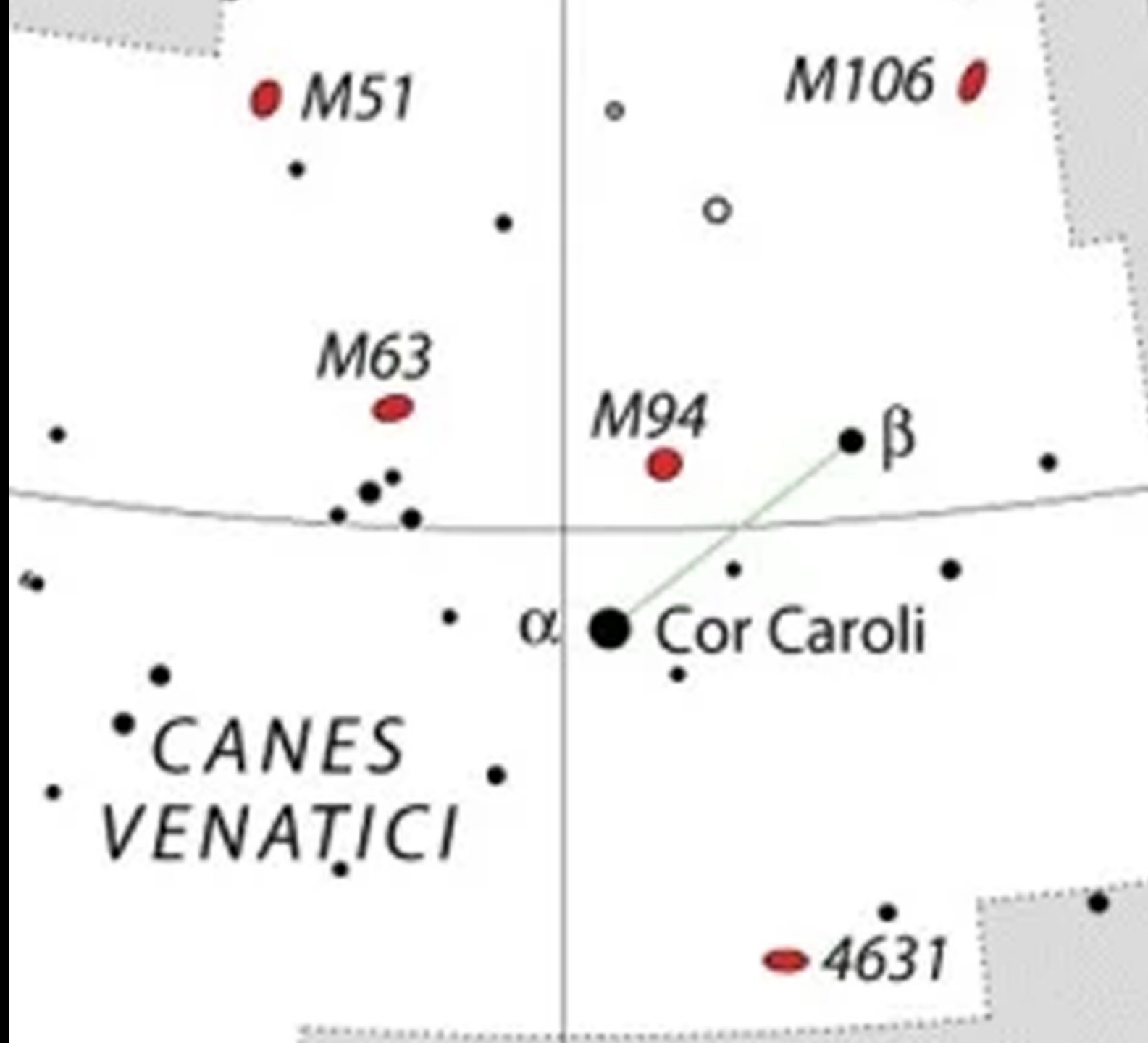
## 26,000 yr Precession of the Earth's N. pole

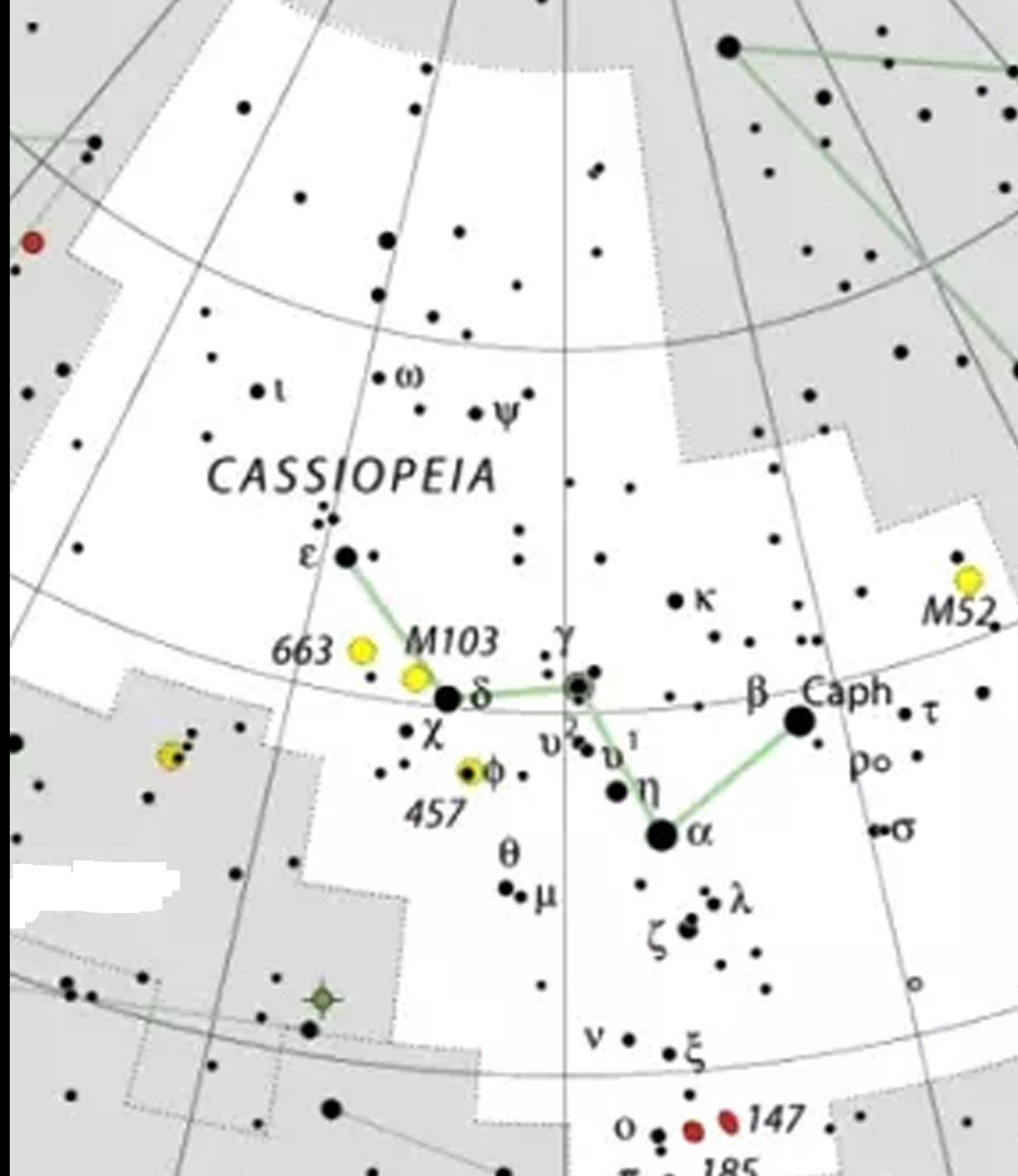




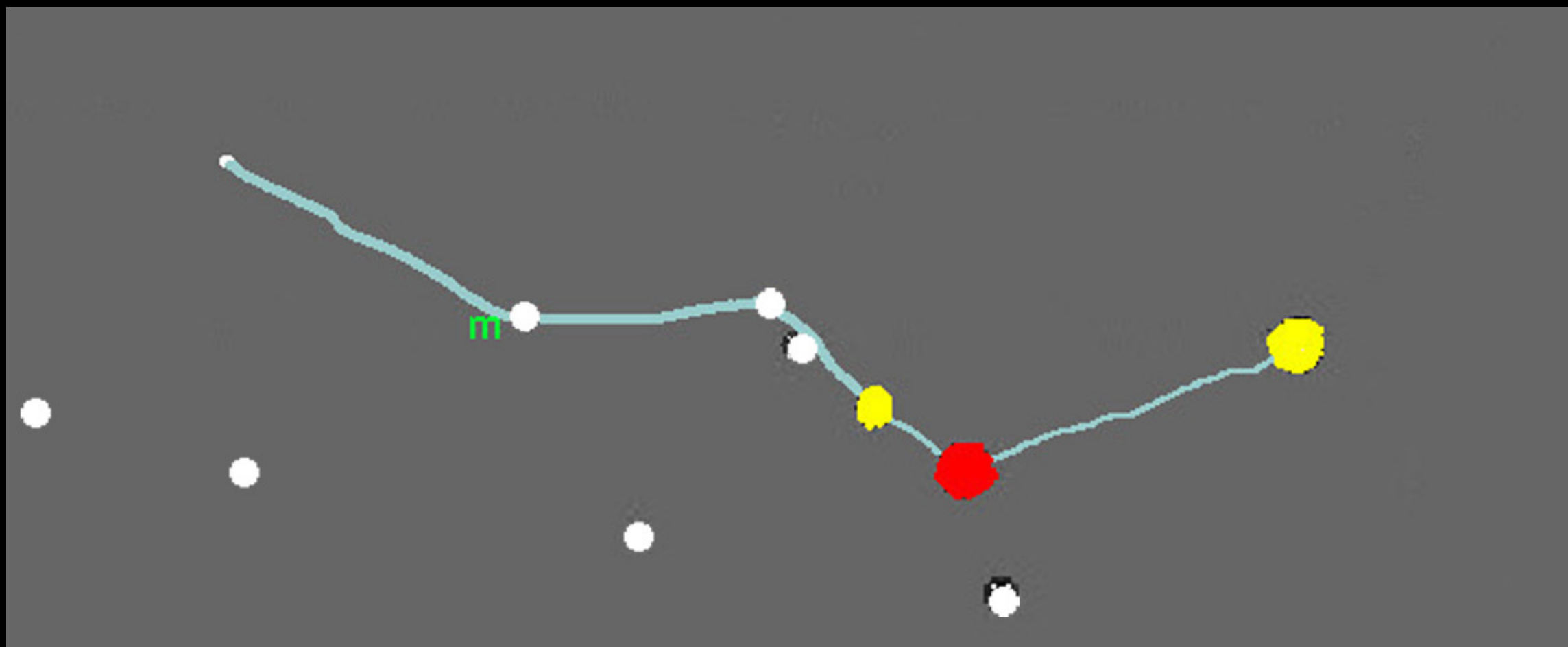


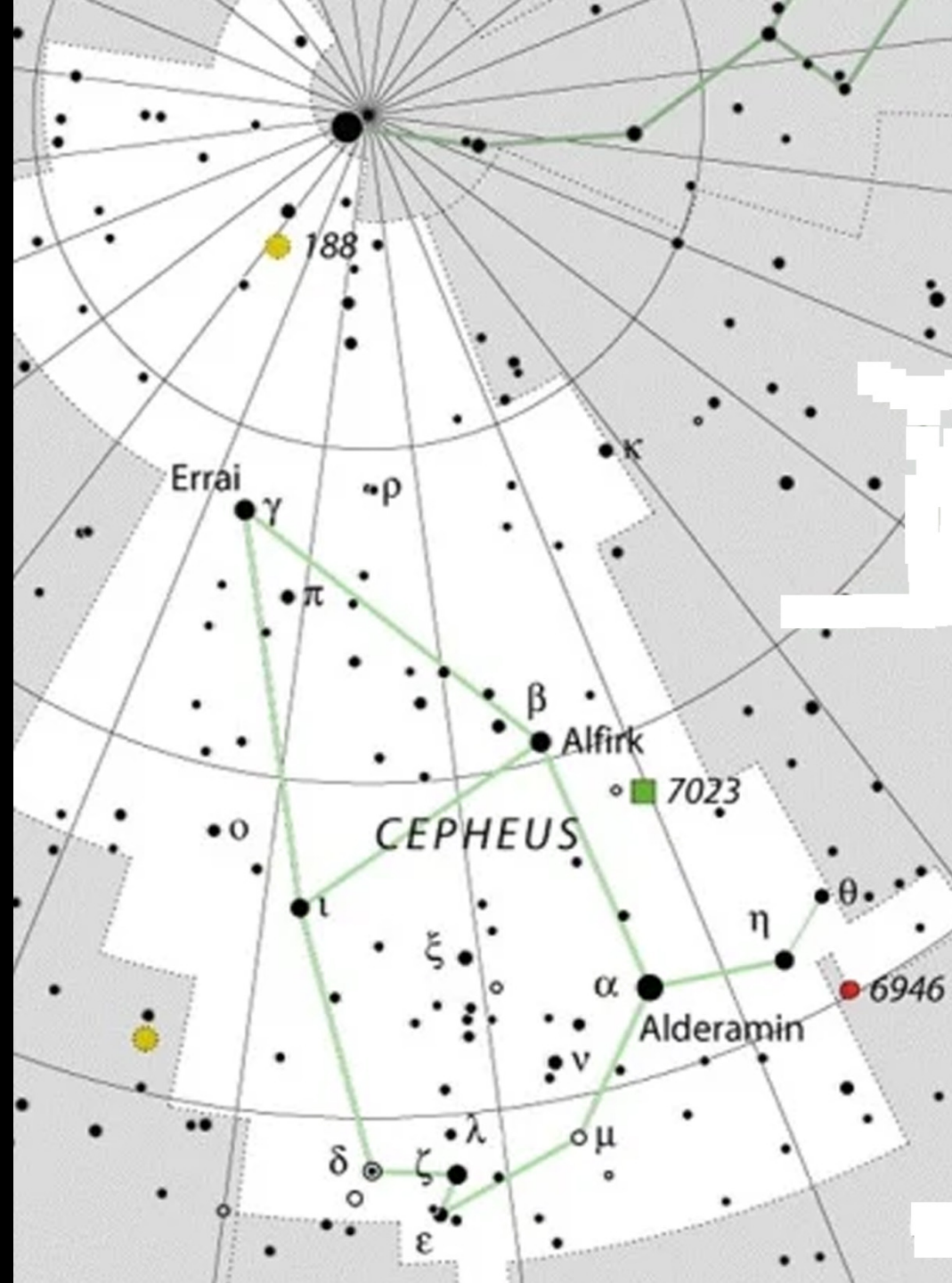




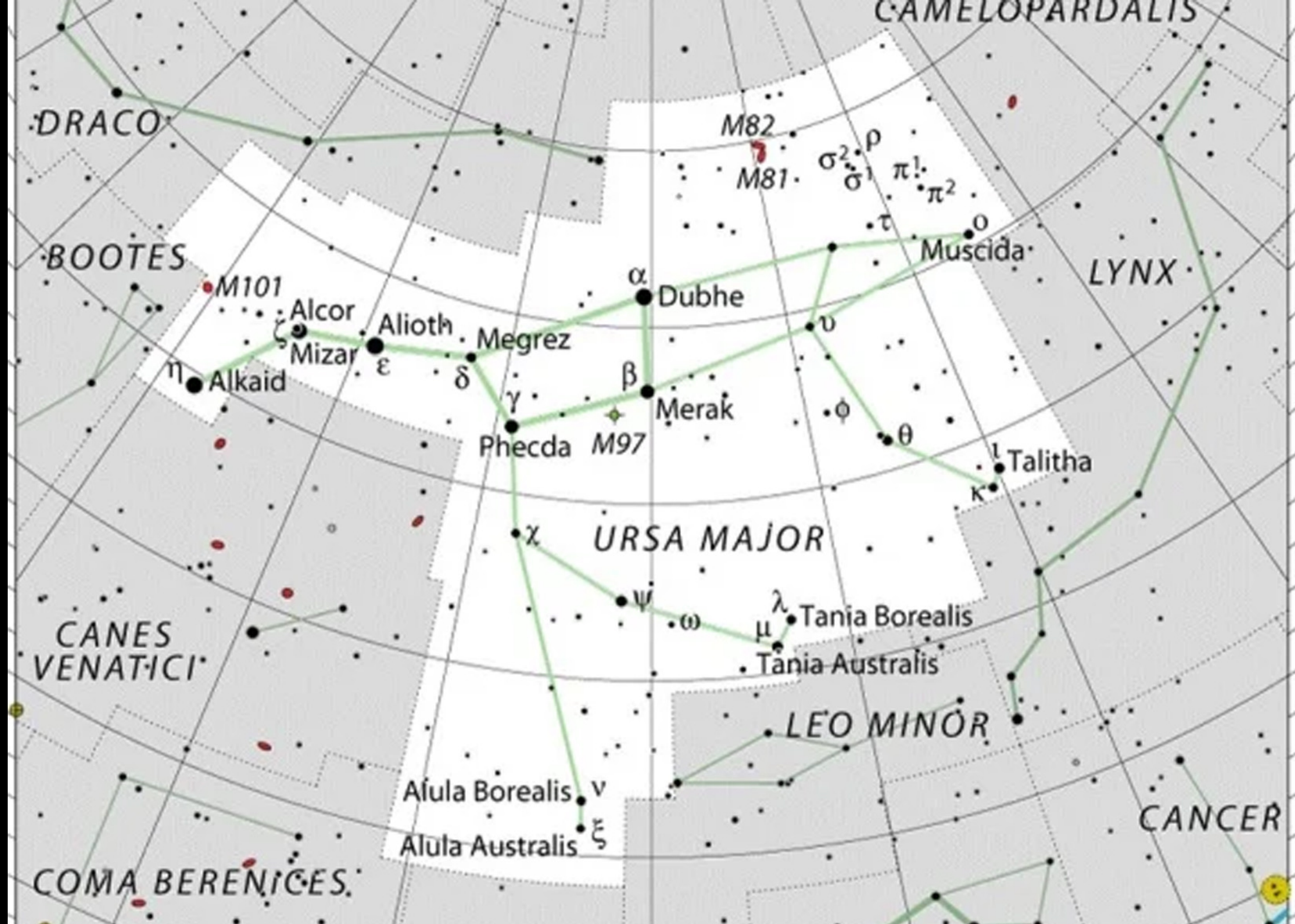




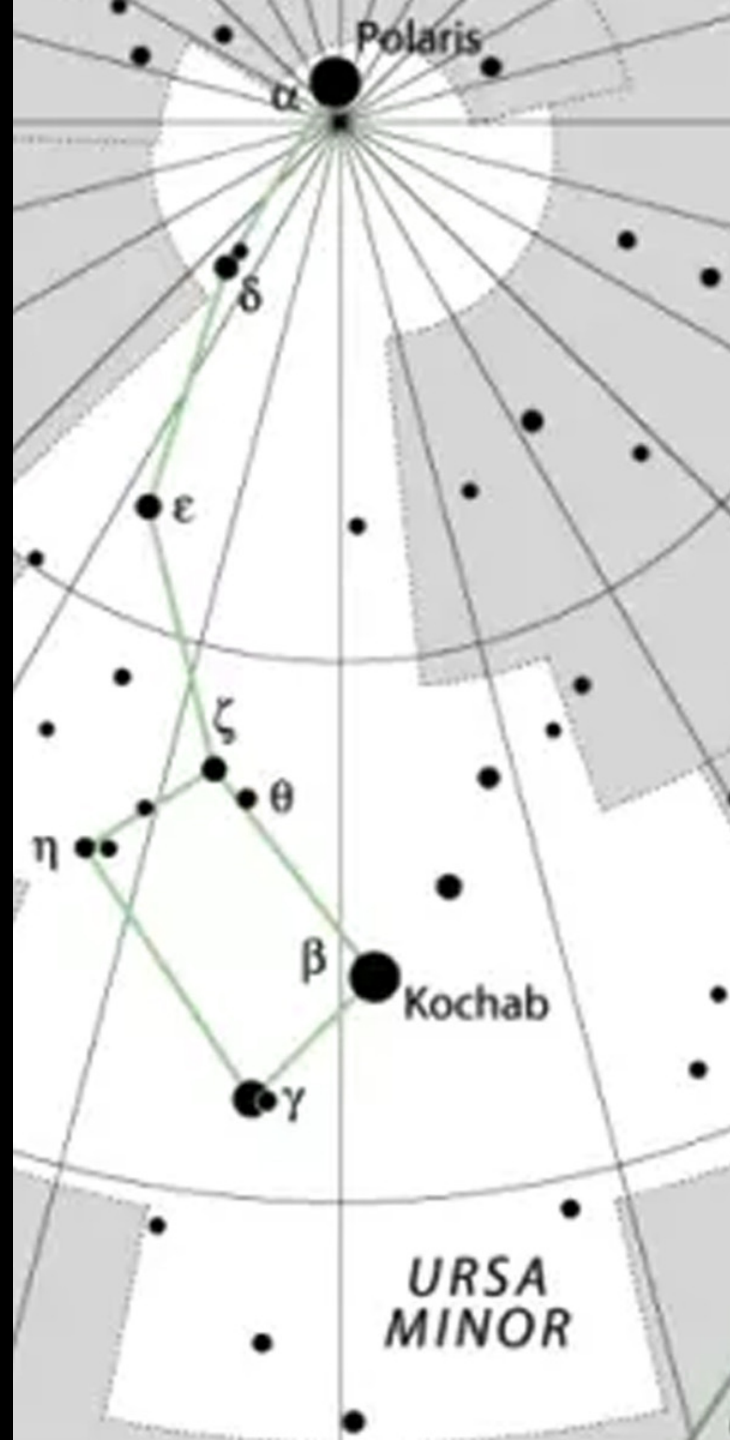




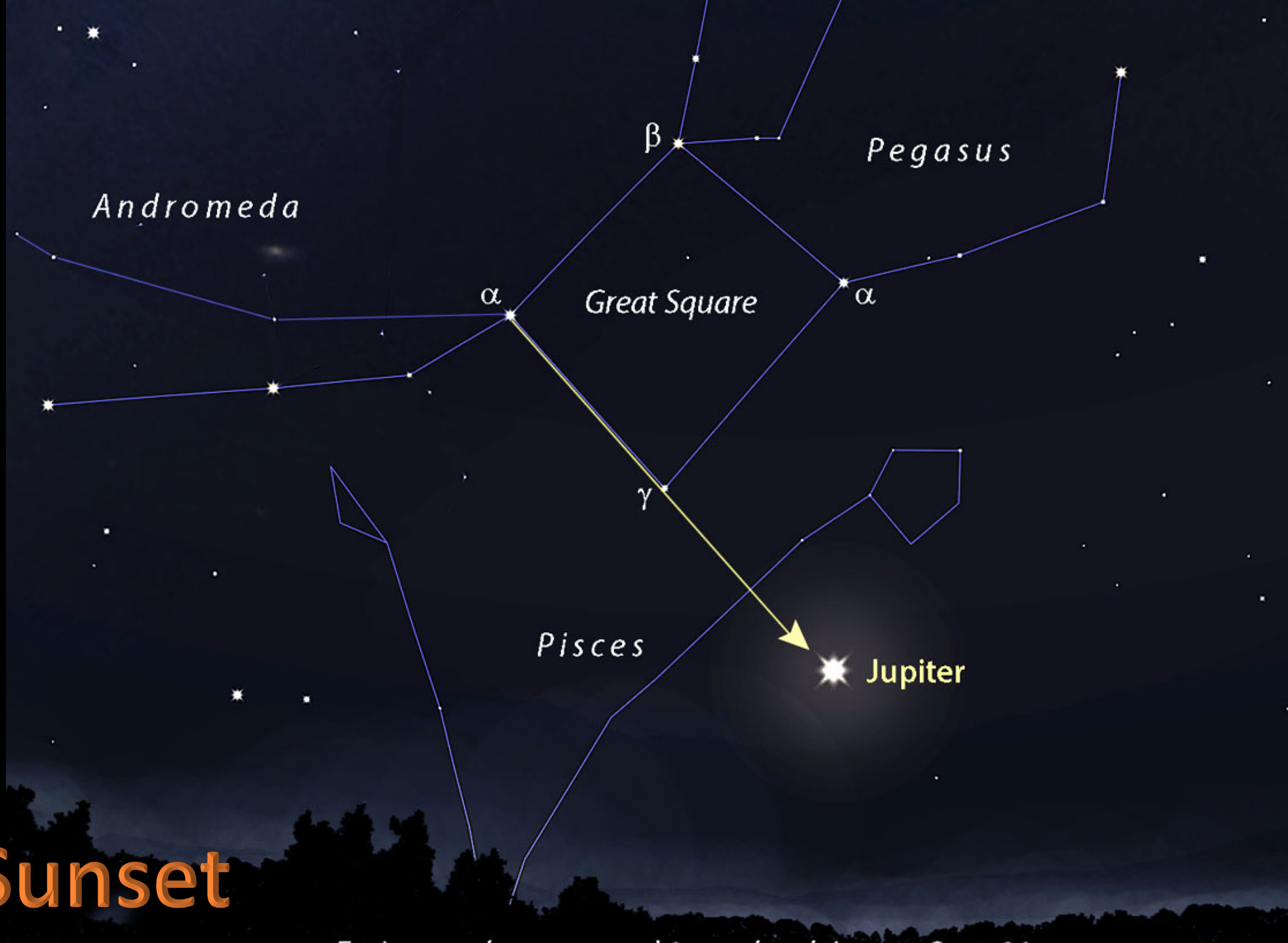




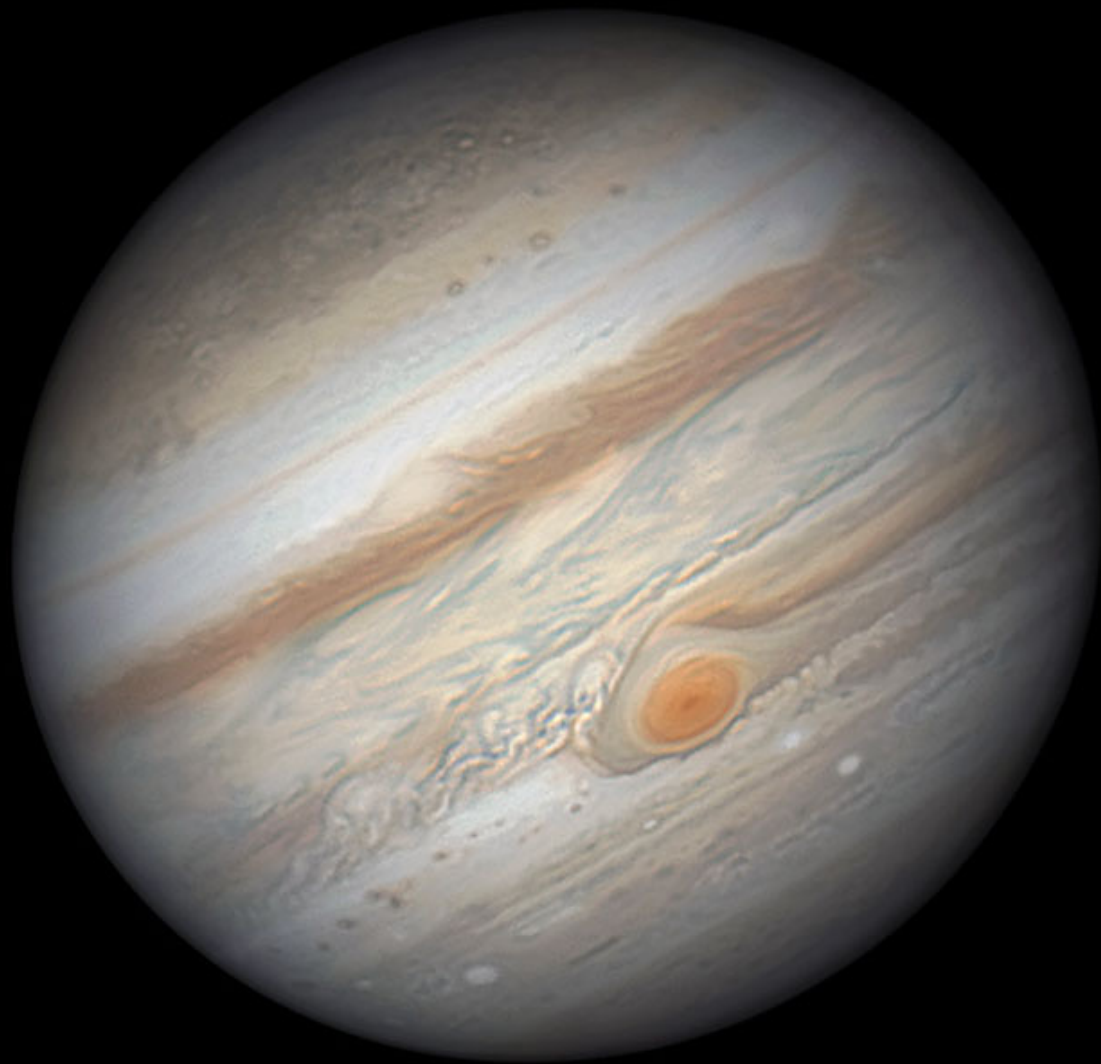




A "Full"  
Jupiter



Rises at Sunset



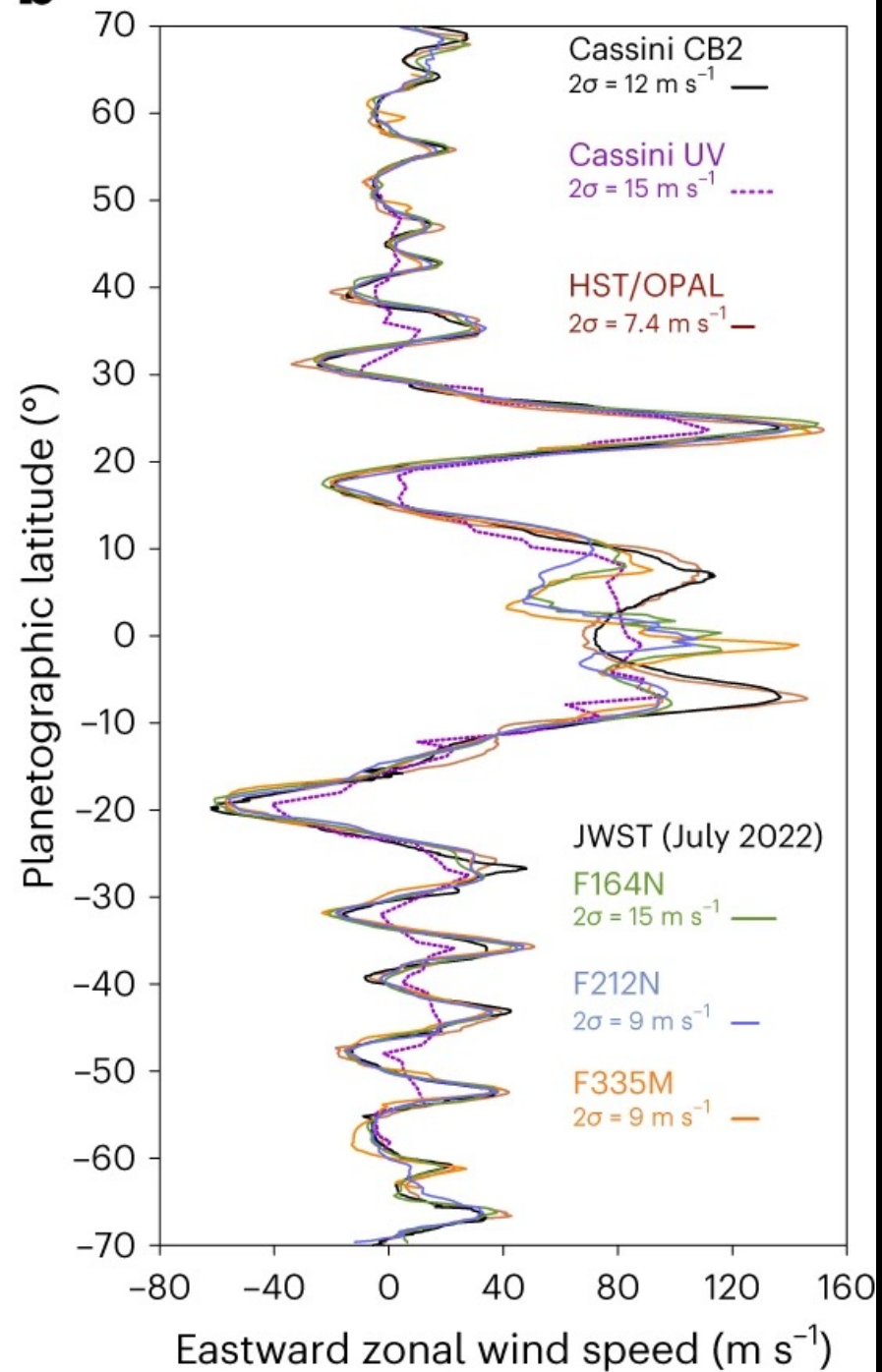


**a**

F212N  
27 July 2022 T10:55:25



JWST , Hubble, Cassini: Nature Astronomy Oct 2023

**b**

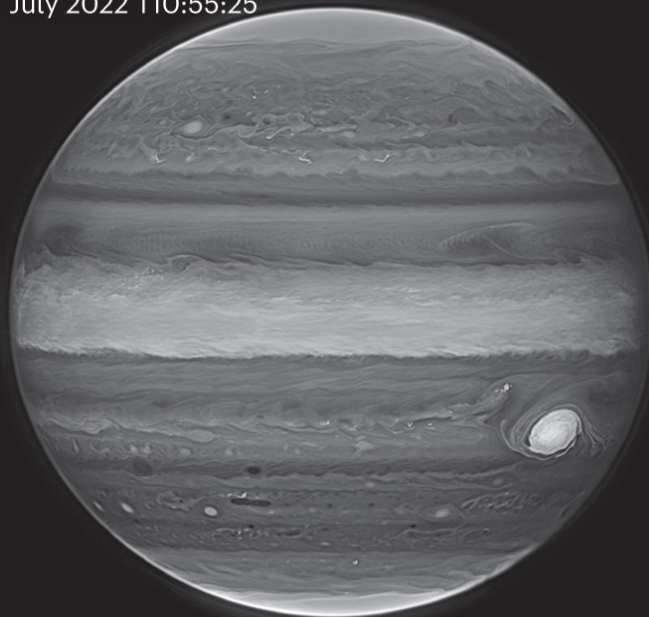
F164N

27 July 2022 T10:29:53



F212N

27 July 2022 T10:55:25



F335M

27 July 2022 T10:55:25



F360M

27 July 2022 T10:29:53



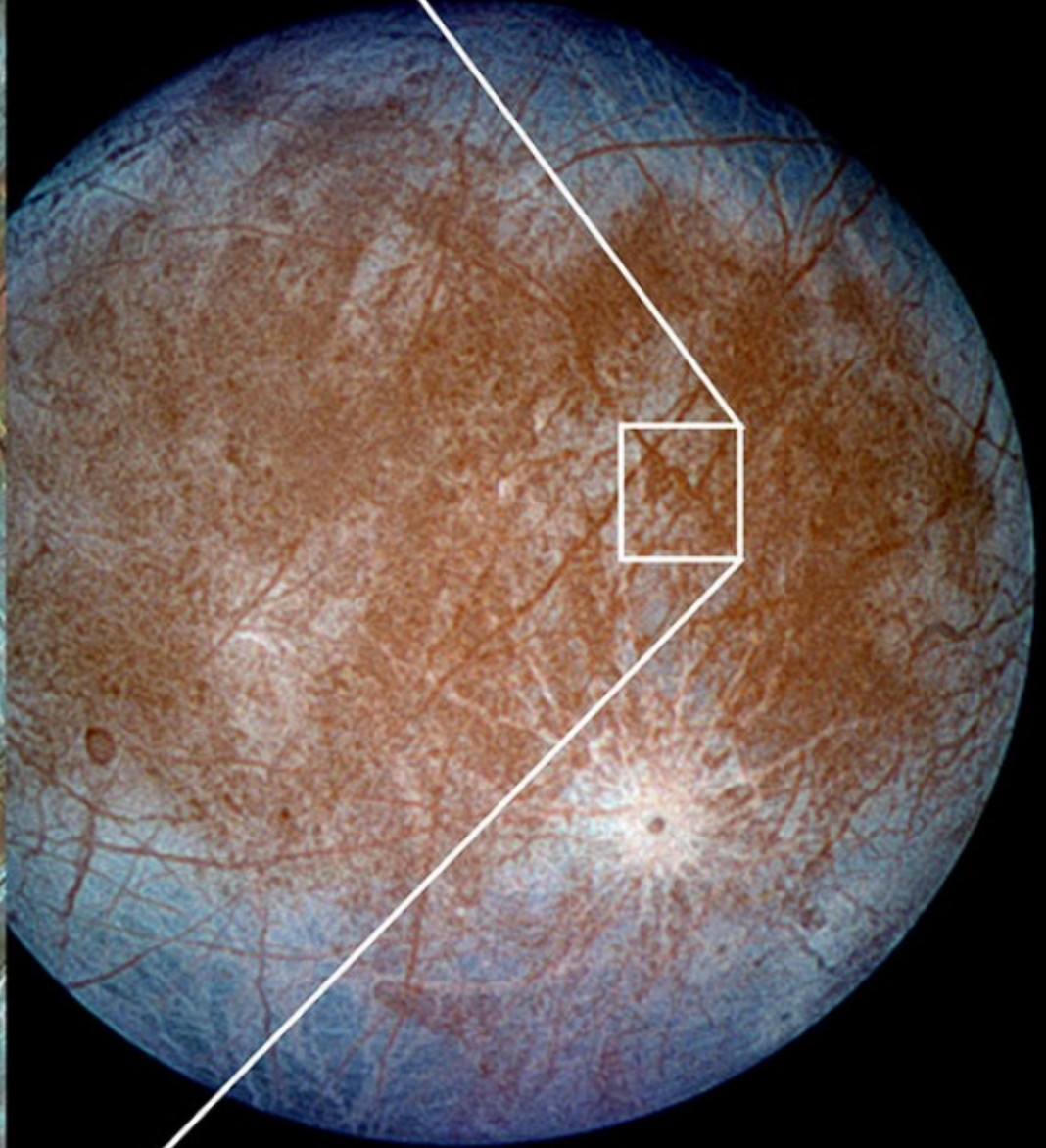
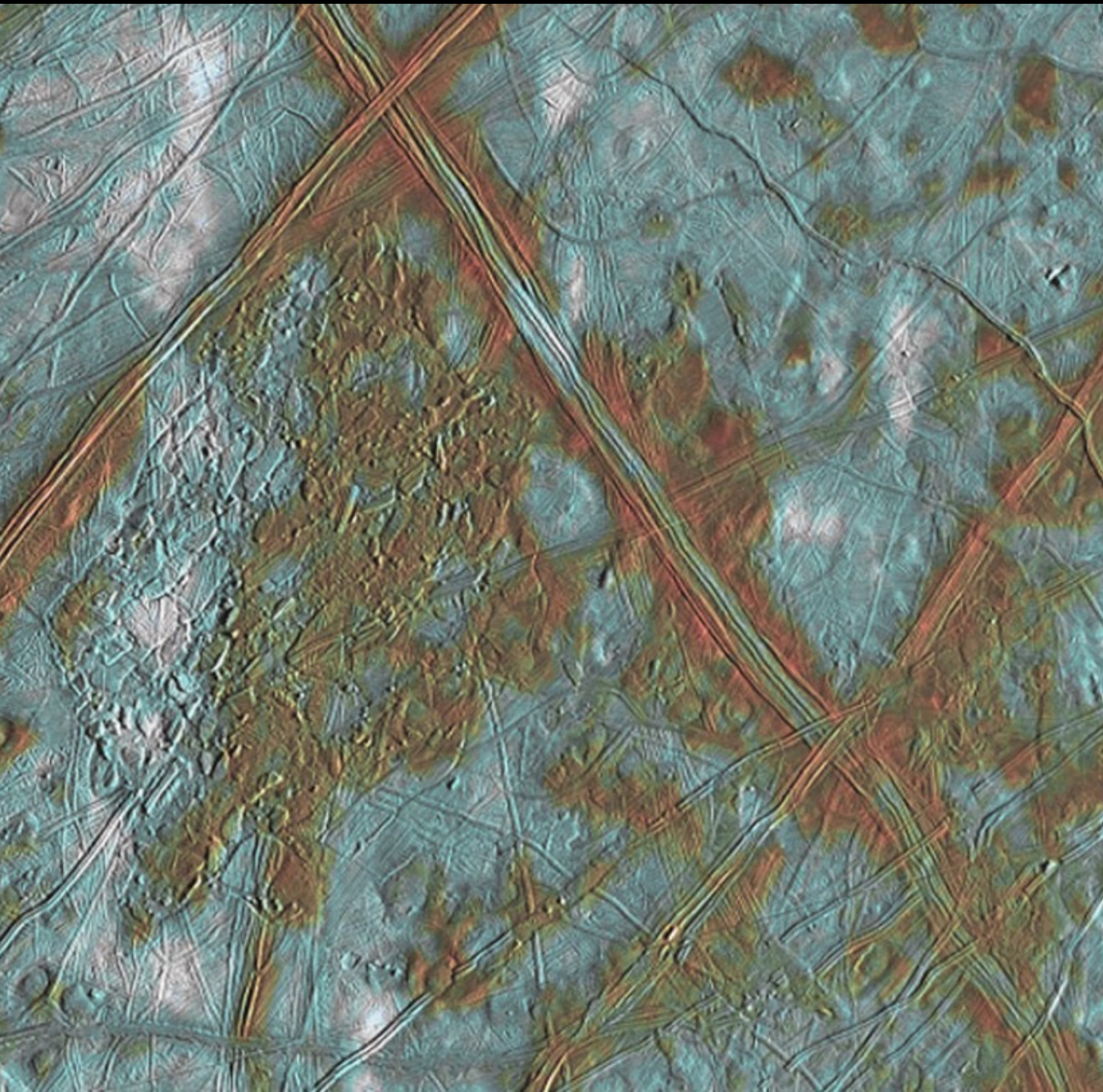
F405N

27 July 2022 T20:28:36





EUROPA





# THE MANY MOONS OF JUPITER

**IN** 1610, Galileo Galilei gazed up through his telescope in the direction of Jupiter. In that moment he likely became the first person to see a moon other than our own, as light that had left the vicinity of the gas giant around half an hour earlier crashed into his pupils and revealed four dotted silhouettes. These Galilean moons, one of which is even larger than the planet Mercury, became the opening entries into a collection that is still increasing today. In fact in 2018, 407 years after the Italian polymath made his discovery, scientists confirmed the existence of

12 more moons locked in slow rotation with the largest planet in our solar system. These newly found satellites form part of a diverse family, many of which share little commonality other than their gravitational anchor. Their orbital shapes range from near perfect circles to highly eccentric and inclined. Their scales vary hugely, from the size of planets to just a kilometer across. Some may have been asteroids captured by Jupiter's powerful gravitational pull, while others were likely a by-product of the very formation of the planet itself.

This data visualization displays every currently known moon of Jupiter, each featuring the year of discovery, discoverer and a representation of scale. Additionally, on the right are some additional insights about the moons. Finally, while all information is correct as of 2018, scientists are finding new wonders in our solar system every day; so who knows how many new Jovian moons are out there right now, held in endless revolutions, just waiting for eyes to meet them for the first time?

**79**  
Moons discovered as of 2018

The Voyager probes, launched in 1977, discovered three of Jupiter's large inner moons

**12**  
The number of moons that are prograde

**51**  
The number of moons that are retrograde

**99.997%**  
The approx. % of the total mass in orbit around Jupiter that comes from the four Galilean moons

One of the newly discovered moons has an odd prograde orbit which sees its path cross several other retrograde moons. This means a collision is very likely, although scientists predict it could take another billion years to actually happen

As of 2018, five of the moons are considered lost

Ganymede, Jupiter's largest moon, is actually 98% larger than the planet Mercury, making it the 9th largest object in our solar system

**54**  
The most moons have been found by a team led by Scott Sheppard

It's thought that several of the larger moons could feature subsurface oceans, leading to some exciting possibilities about the existence of life there!

A German astronomer called Simon Marius independently discovered the four Galilean moons at the same time as Galileo. While he didn't receive the title of discoverer, he is responsible for their names, which are still used today

## Reading the data visualization

### Representing each moon

- Discovery year
- Moon name
- Discoverer

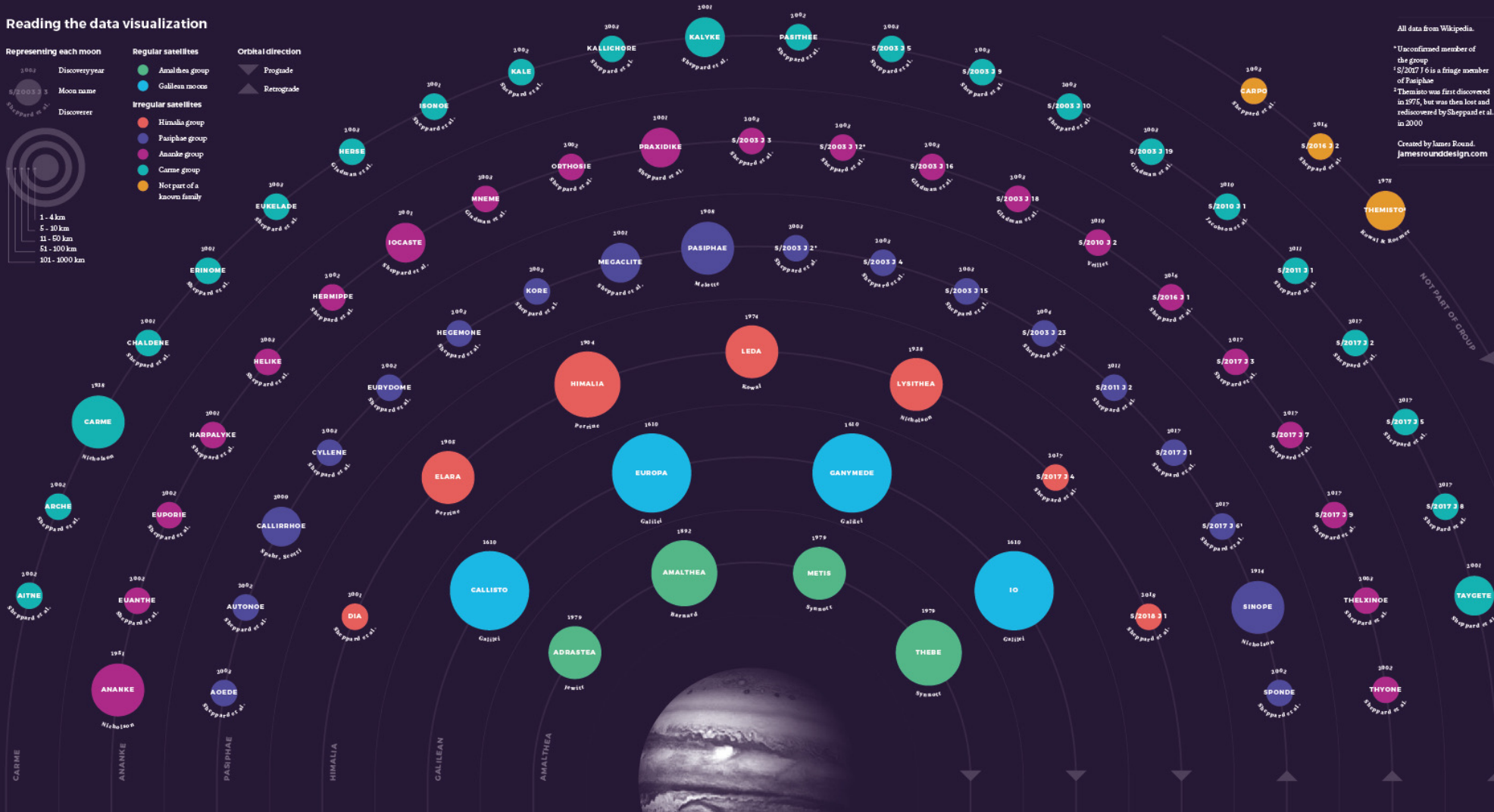


### Regular satellites

- Amalthea group
- Galilean moons
- Irregular satellites
- Himalia group
- Pasiphae group
- Ananke group
- Carne group
- Not part of a known family

### Orbital direction

- Prograde
- Retrograde



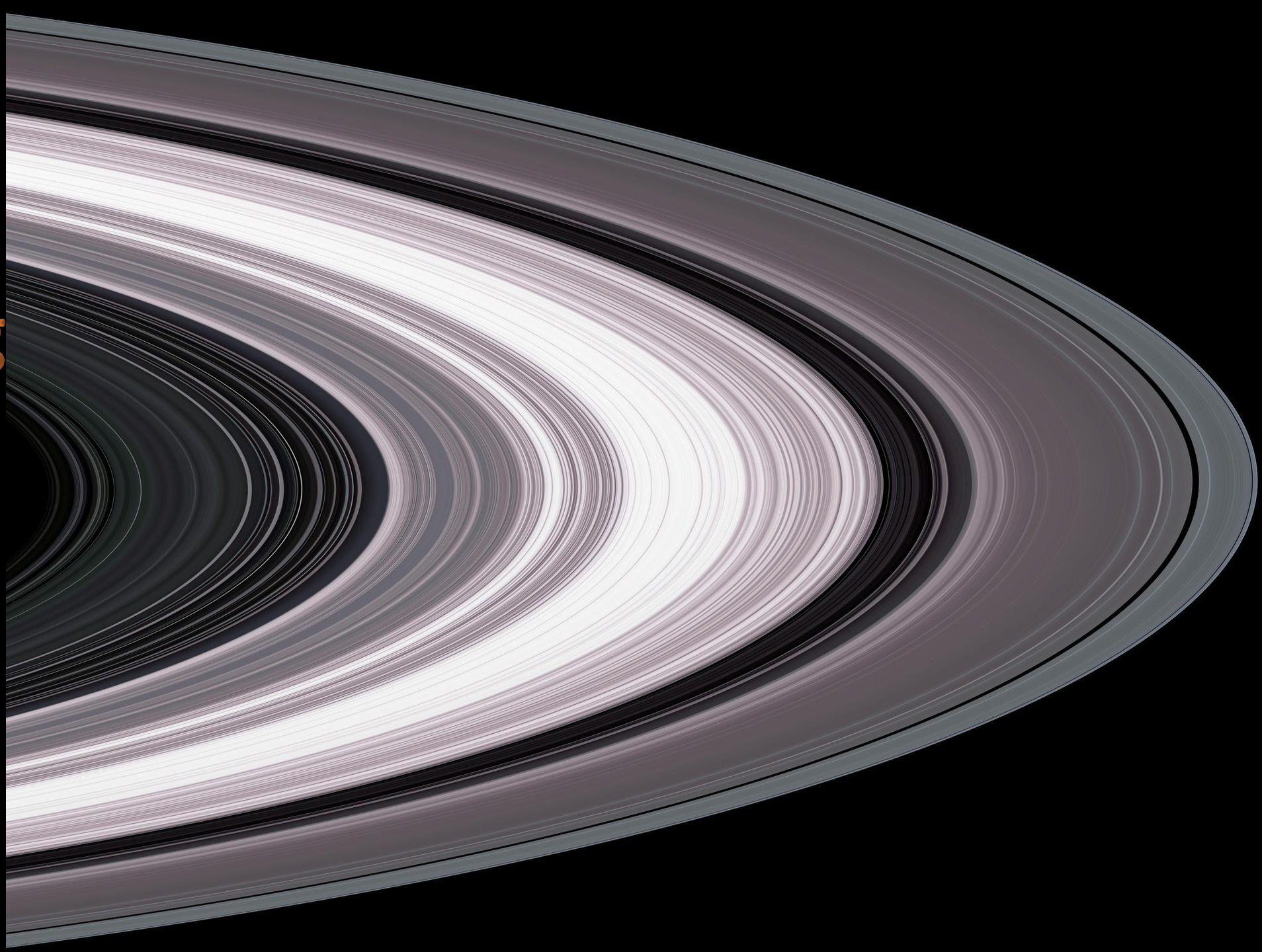
All data from Wikipedia.

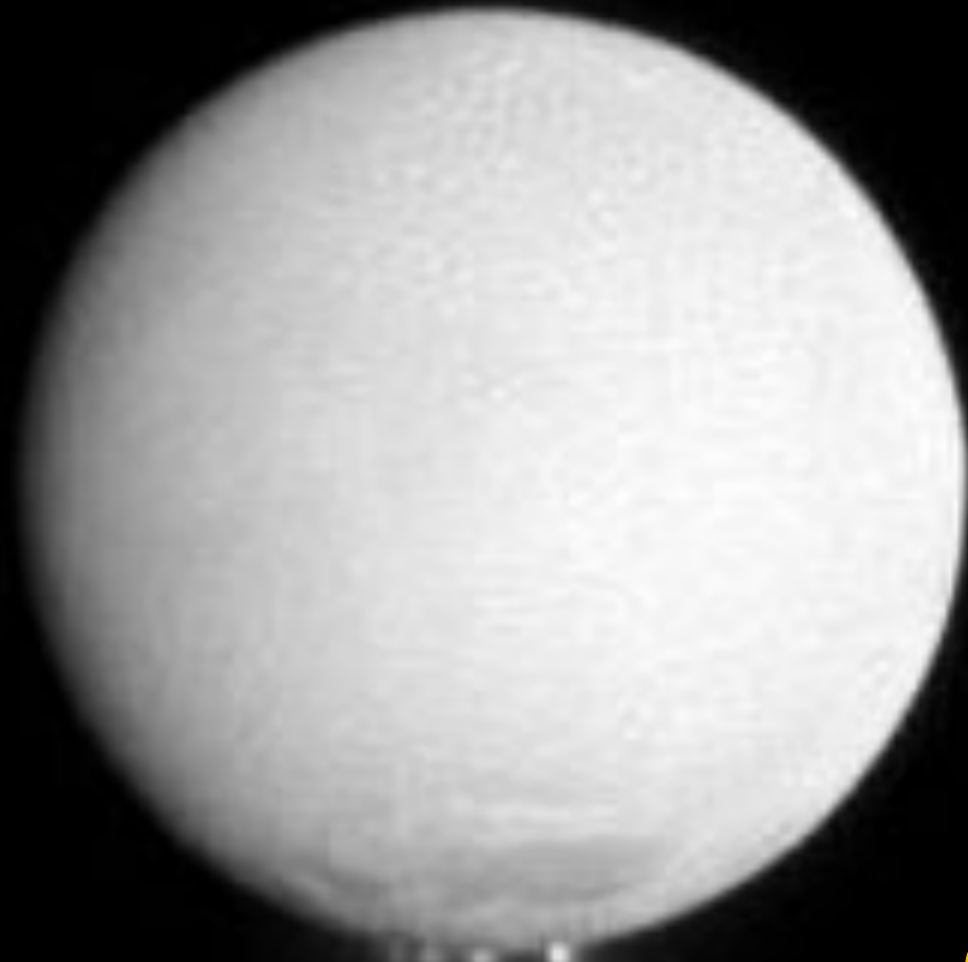
\* Unconfirmed member of the group  
 † Themisto was first discovered in 1976, but was then lost and rediscovered by Sheppard et al. in 2000

Created by James Round, jamesrounddesign.com

# Evaporating Rings of Saturn

JPL





Enceladus

Geysers of water vapor