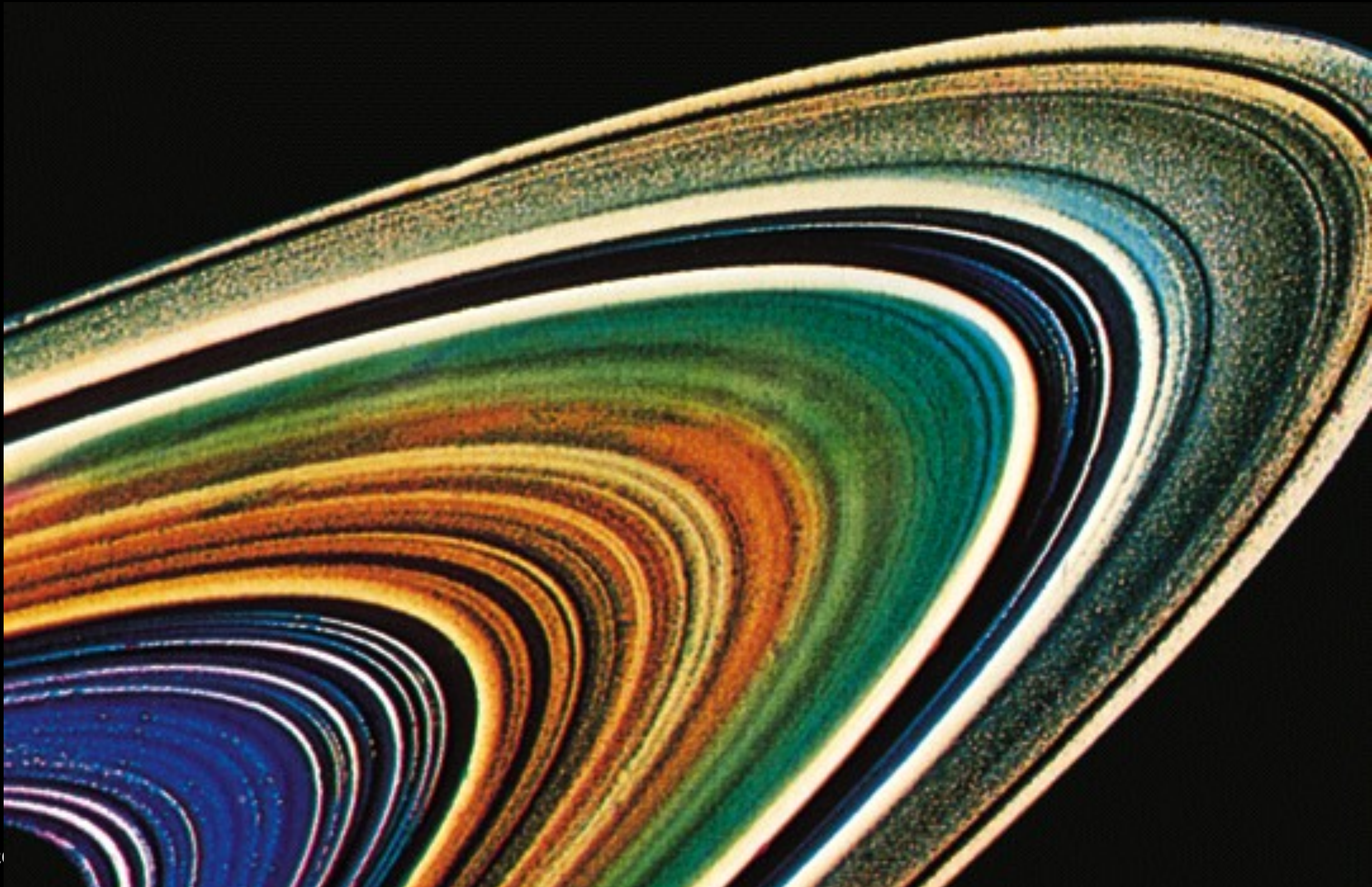


SATURN

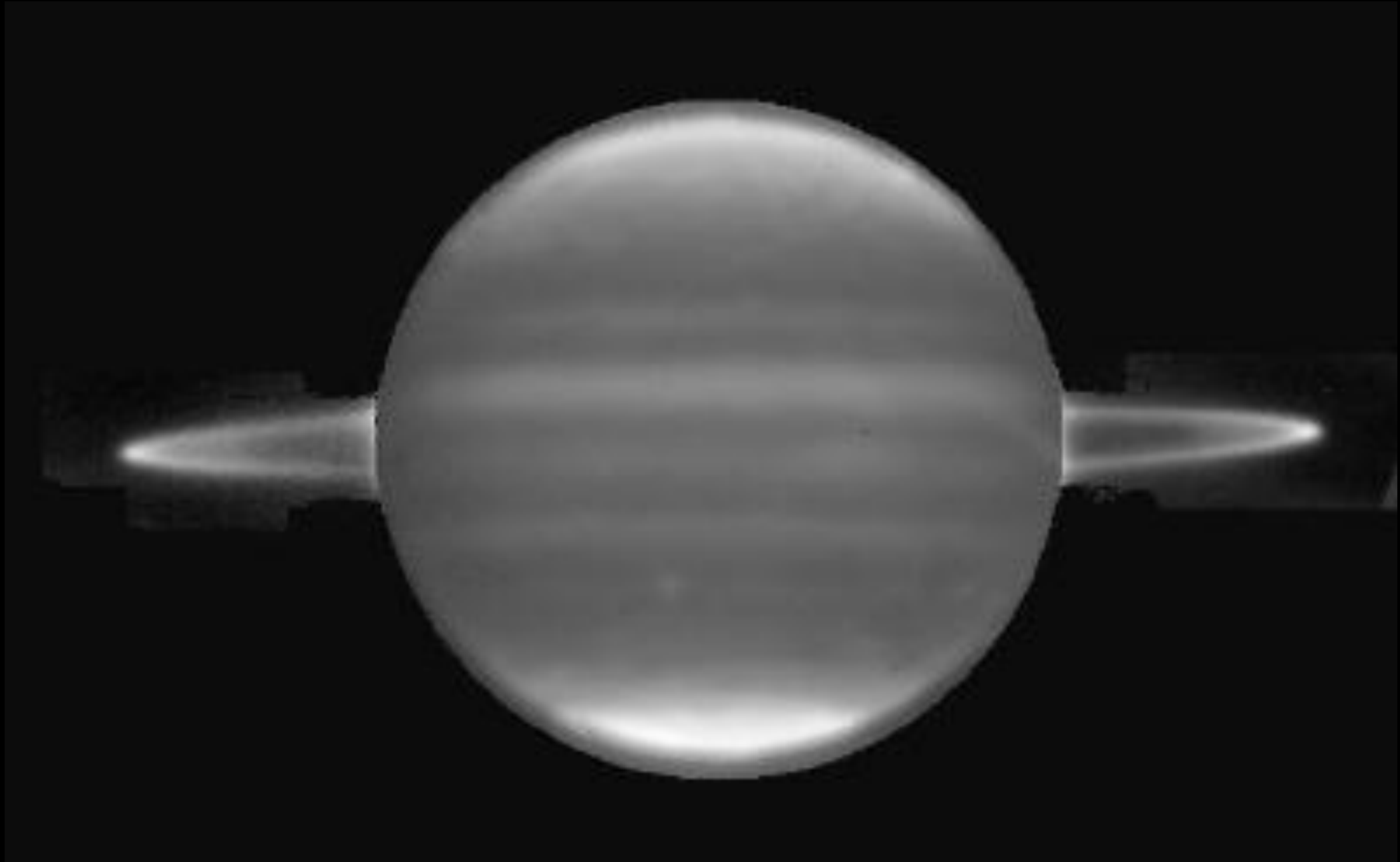


**Undefeated Solar System
Hula Hoop Champ**

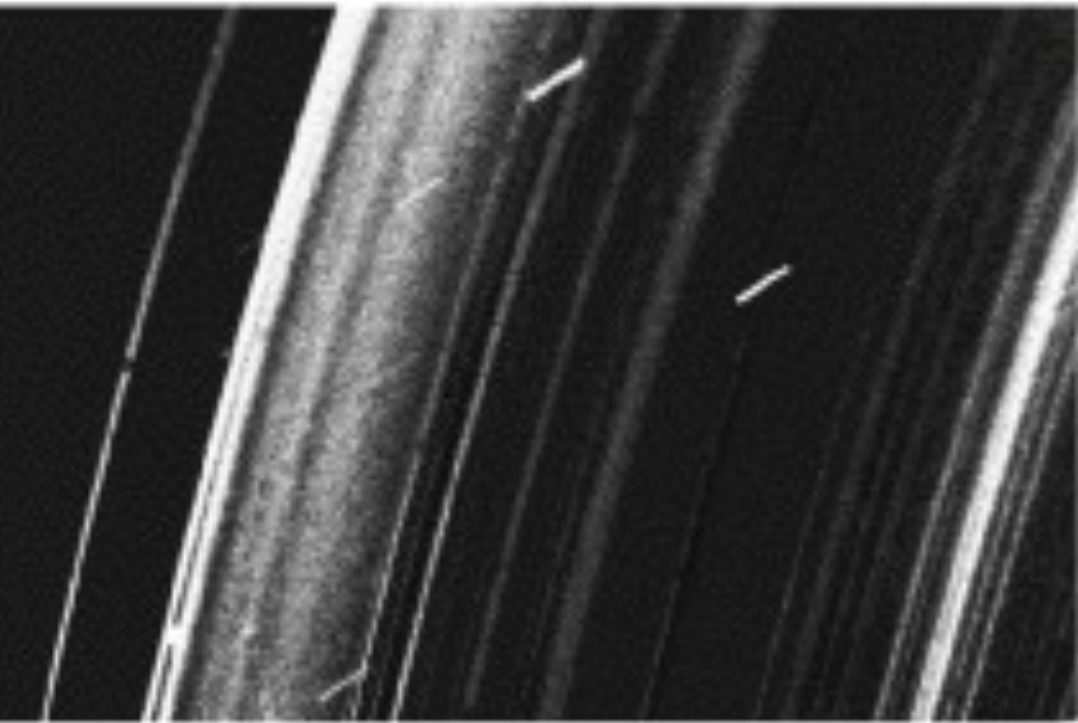
Saturn's spectacular rings are composed of fragments of ice and ice-coated rock



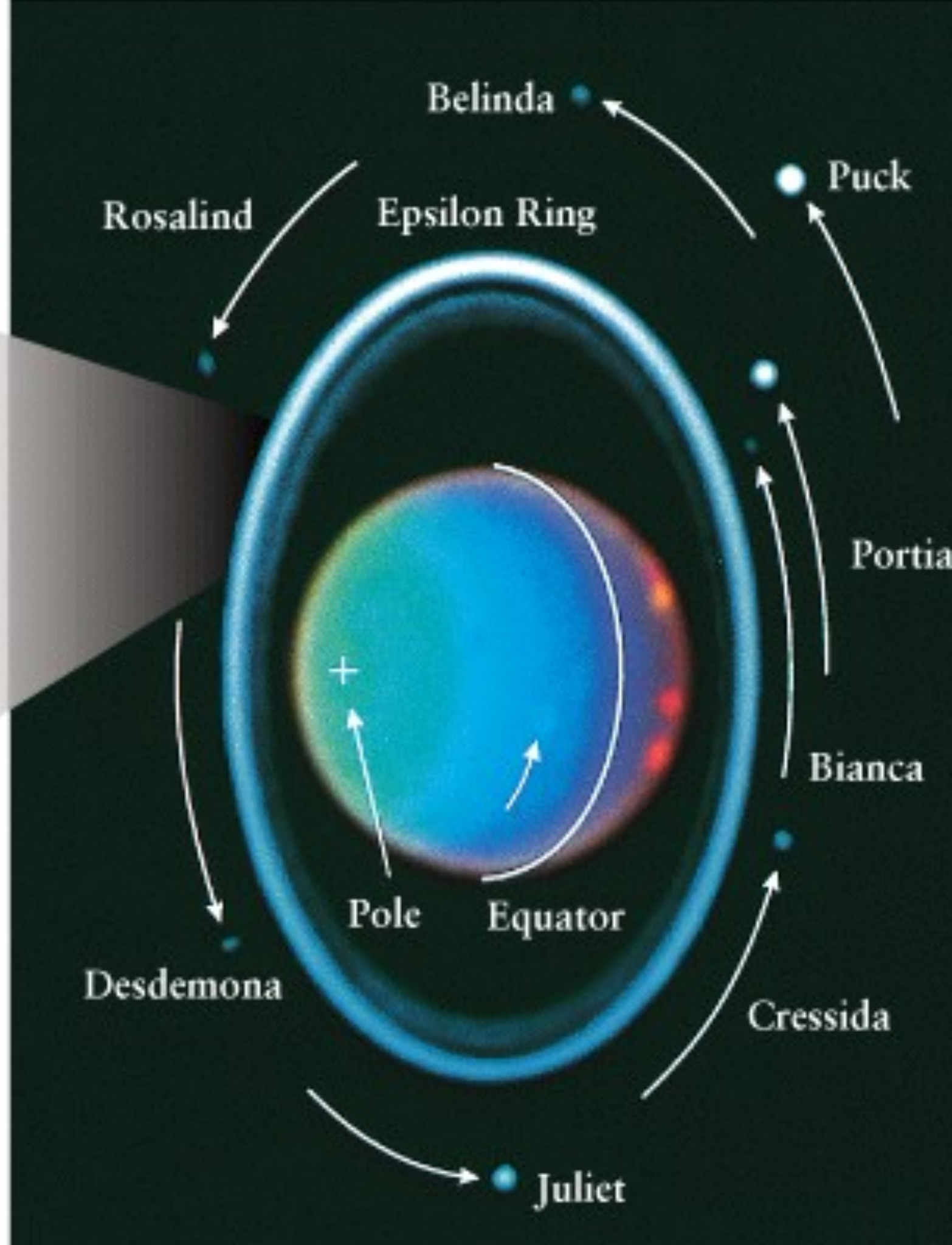
Jupiter's ring was not discovered until 1979—when the Voyager 1 spacecraft sent back photos.



A system of rings and satellites revolves around Uranus



They are fairly dark, so hard to see from Earth.



Uranus

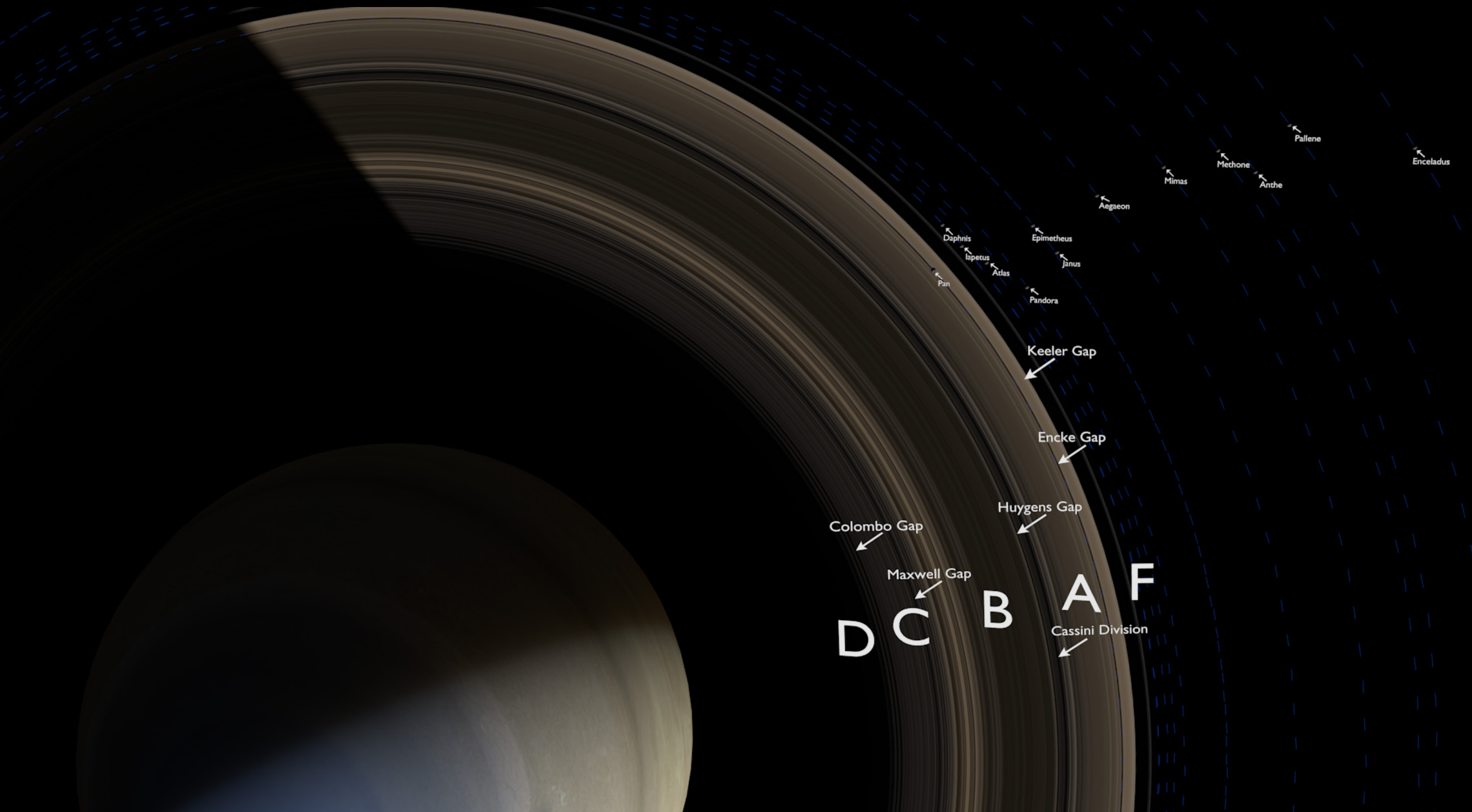


Narrow rings with darker particles than Saturn

Neptune's Rings



Saturn's rings



- About 70,000km wide but only 20km thick



The rings are made up of billions of ice particles—each in its own orbit around the planet.

- The ring particles can't be as old as Saturn but must be replenished by impacts on Saturn's moons or other processes.

Icy particles
from snowflake
to boulder size,
in orbit.



How do rings form?

- Breakup hypothesis: remains of a moon collision
- The opposite: coalescence from smaller particles

Ring Formation



- Jovian planets all have rings because they possess many small moons close-in.
- Impacts on these moons are random.
- Saturn's incredible rings may be an "accident" of our time.

What keeps rings in place?

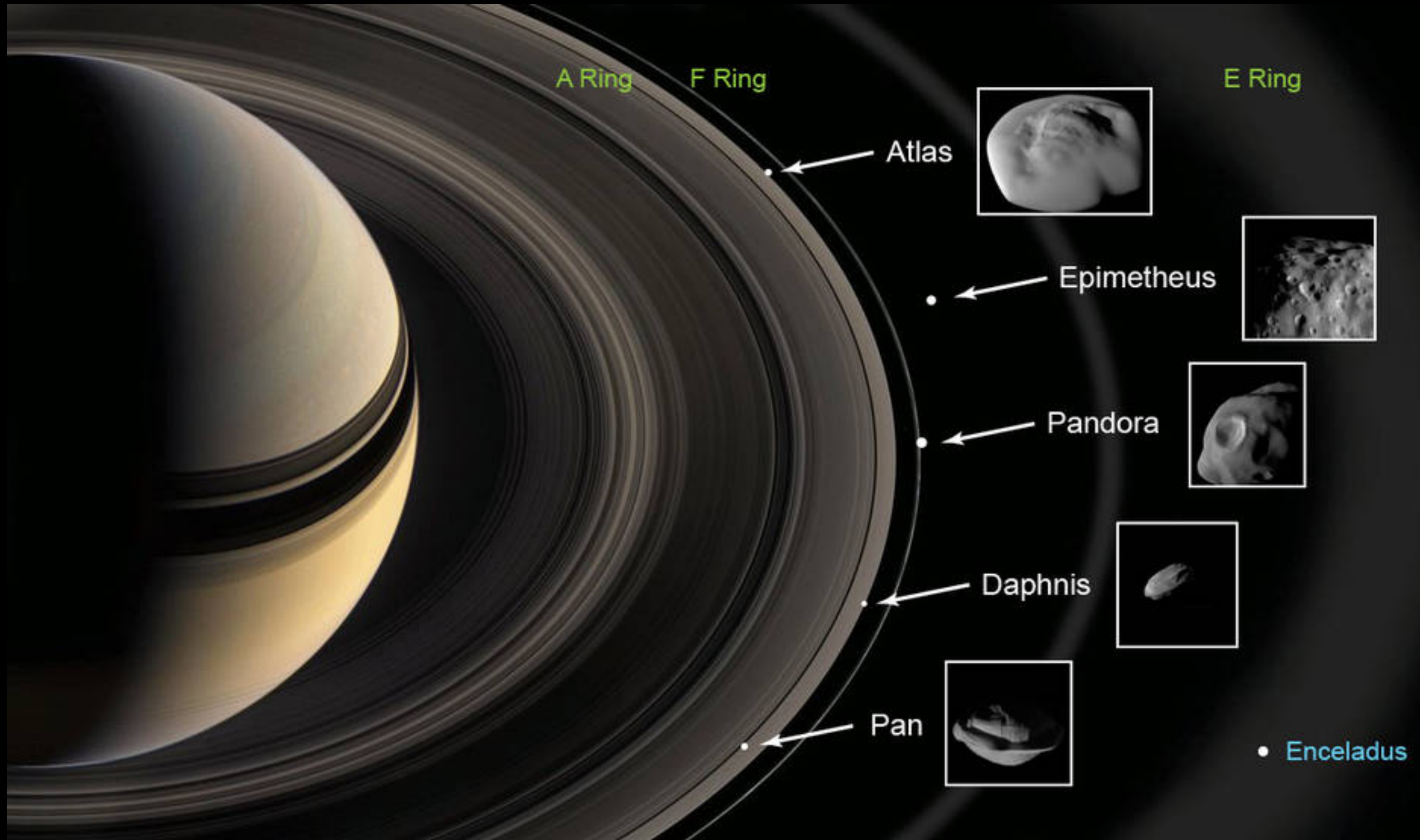
- Moons keep rings from dissipating and also create the gaps we see
- Some other forces might contribute (magnetic effects??)

Gap Moons

- Some small moons create gaps within rings.



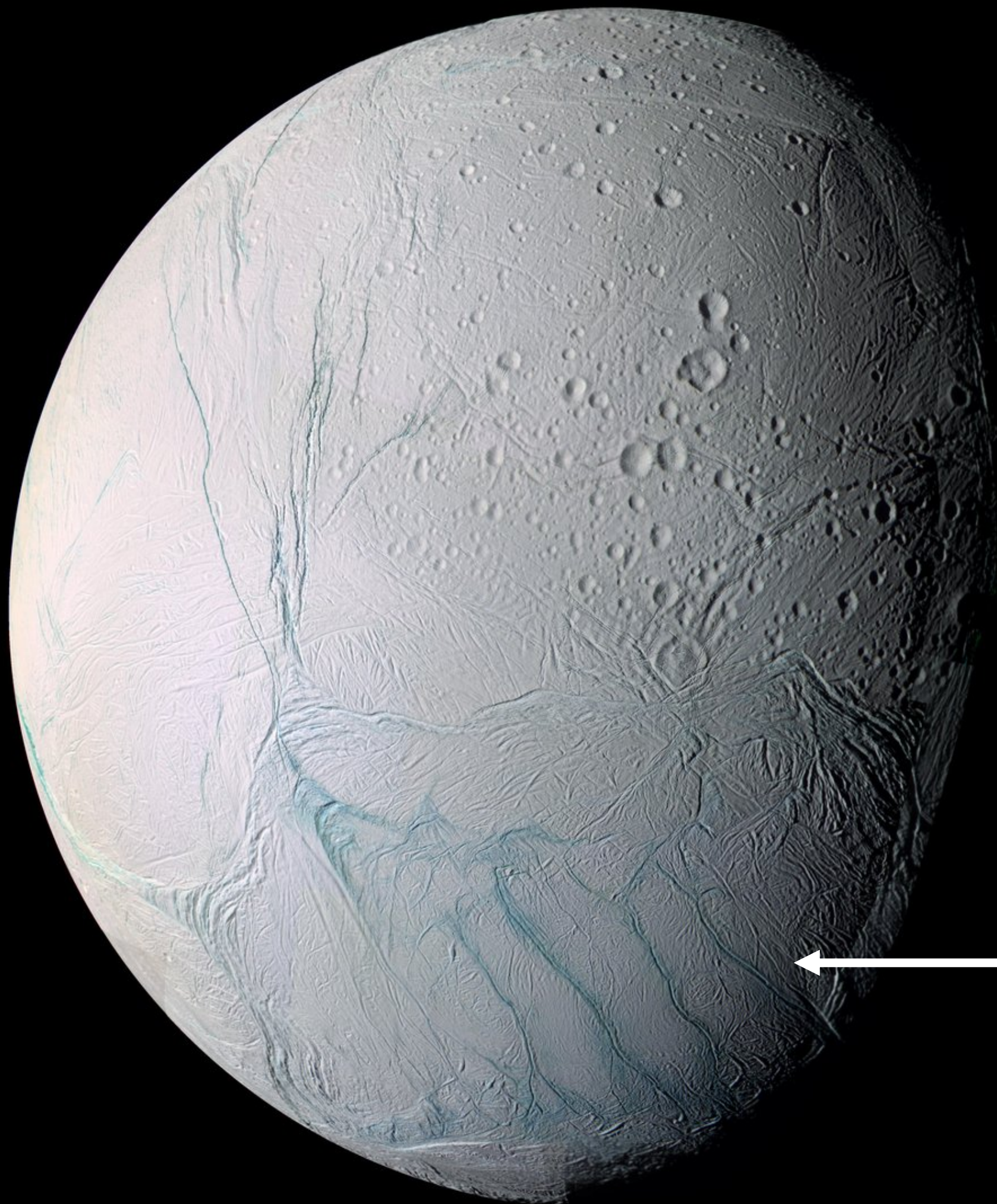
Saturn



Saturn's E Ring

Fed by the geysers of moon Enceladus-
high pressure sprays of salty water





Could Enceladus
harbor life??

“tiger stripes”



Saturn's F Ring

Multiple “ringlets”
in here...

Pandora

Prometheus



ζ /R1986U2

6

4

α

η

5

β

γ

δ

λ

ϵ

Bianca
Cressida
Desdemona
Juliet

Cordelia

Ophelia

Portia

ν

Rosalind

Perdita

Cupid

Belinda

Puck

μ

Mab

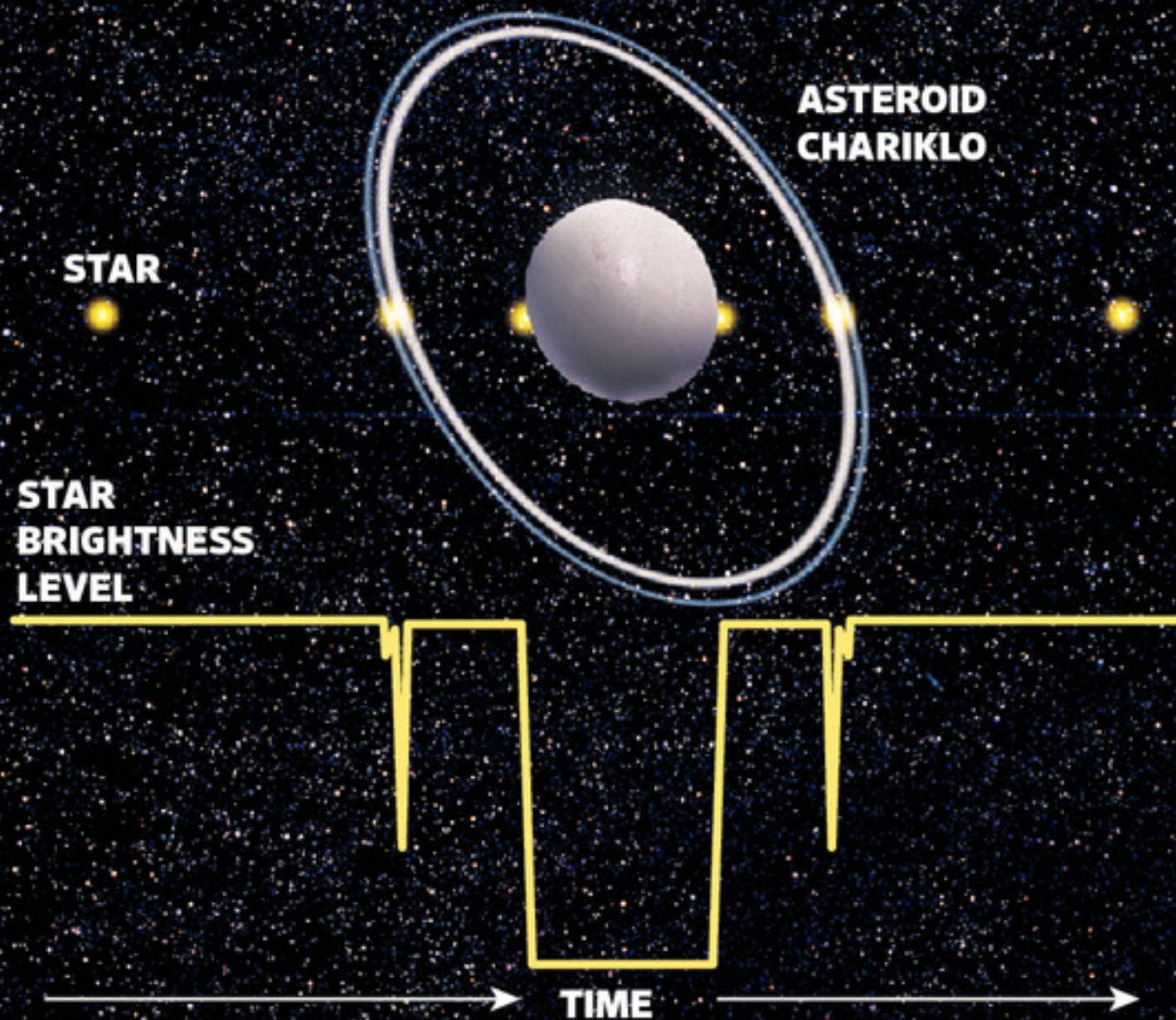
Miranda

Uranus:
13 rings,

Probably
water ice
and
carbon

Spotting a Ringer

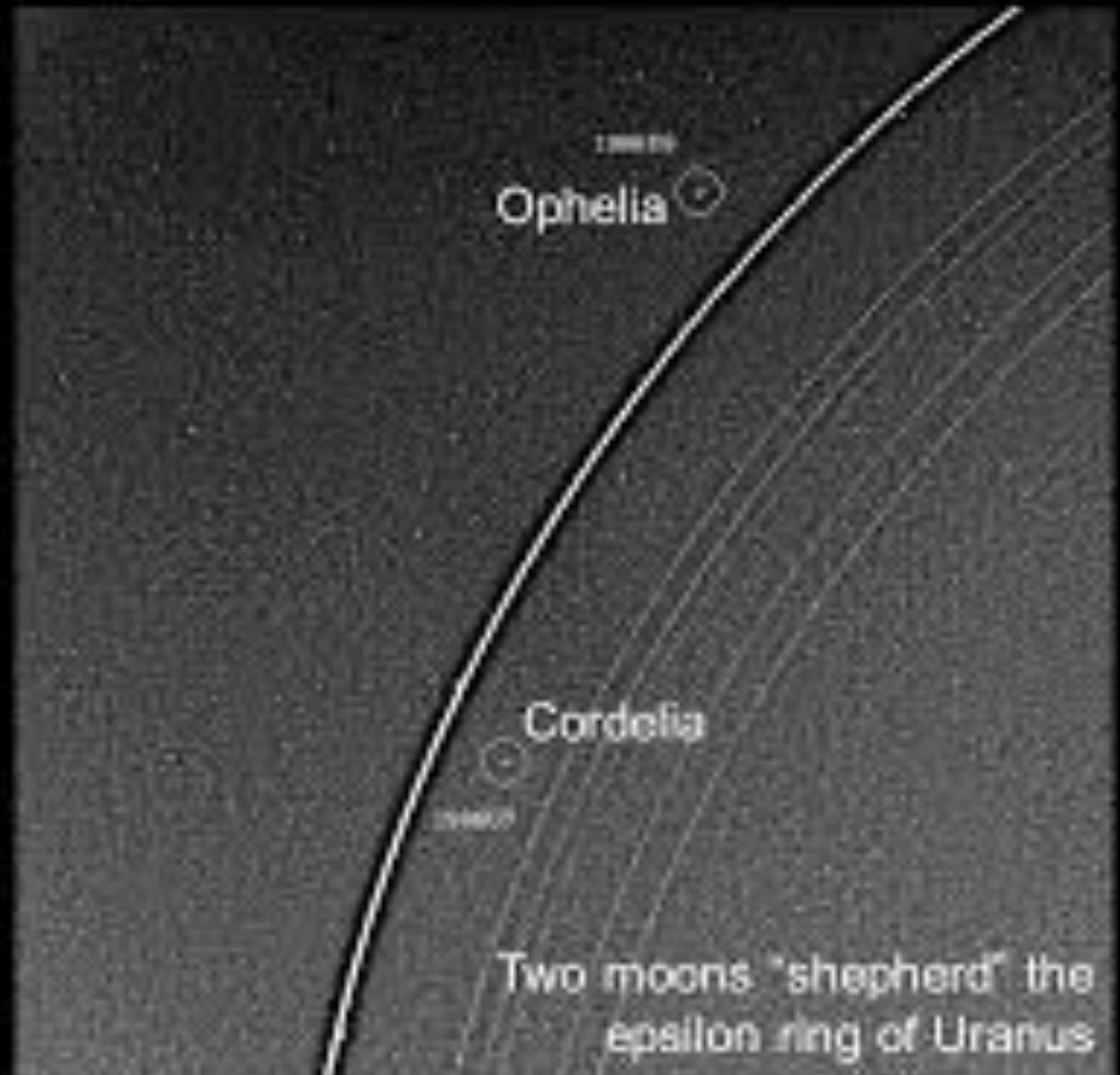
Scientists on Wednesday announced the discovery of rings around a distant asteroid-like object called Chariklo, the first such finding of rings not encircling a planet. The discovery was made by tracking Chariklo as it moved past a star and altered its light in a way consistent with a ring pattern.



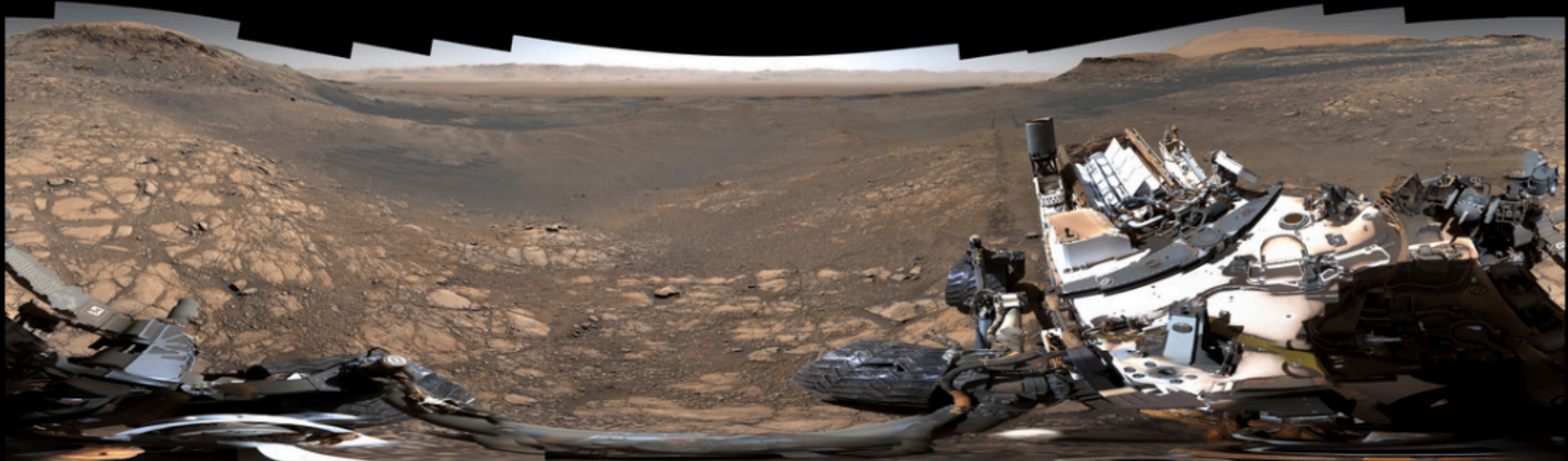
Discovered
by
occultation

Uranus' Epsilon Ring

Made of particles
from a former
collision?



In the news: Curiosity takes a panorama



<https://mars.nasa.gov/>

Jupiter storm merger this week!

