HURTIGRUTEN

Astronomy Voyage

Dr Darren (Das) Baskill
Astronomer at the University of Sussex, UK

Our Solar System

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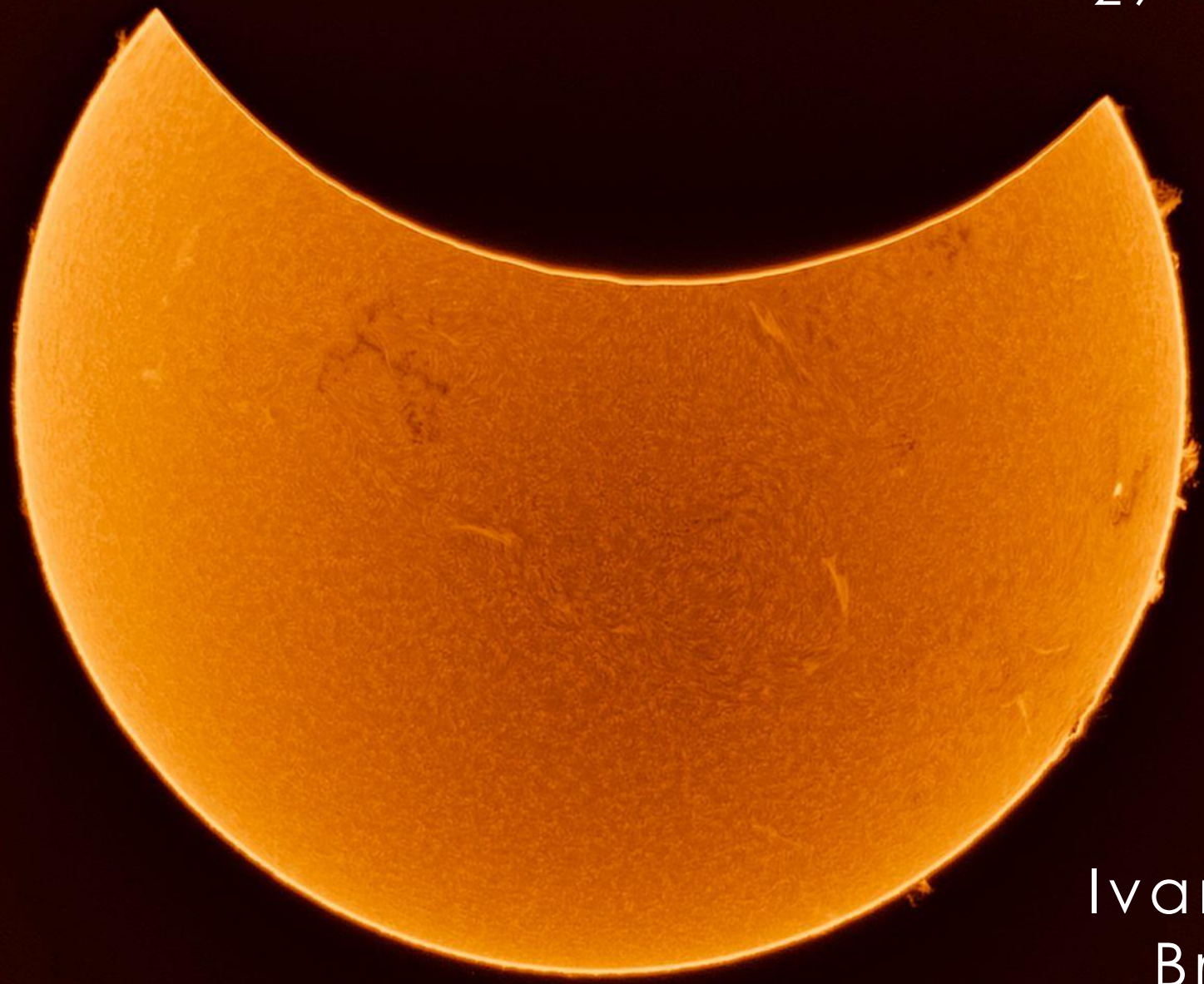
UNIVERSITY OF SUSSEX

The Sun

Partial Solar eclipse
29th March, 2025



Ivana Peranic
Brighton, UK

The Sun

Partial Solar eclipse

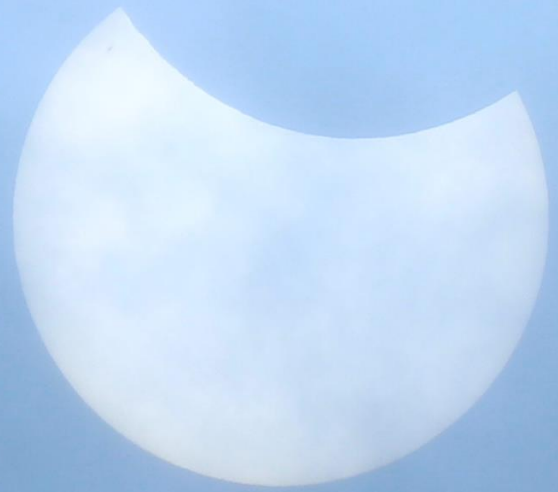
29th March, 2025

Tony Abbey,
Leicestershire

The Sun

Partial Solar eclipse

29th March, 2025



Dr Das Baskill
from deck 7 of Hurtigruten's MS Richard With

Mercury

Radius: 2,440 km

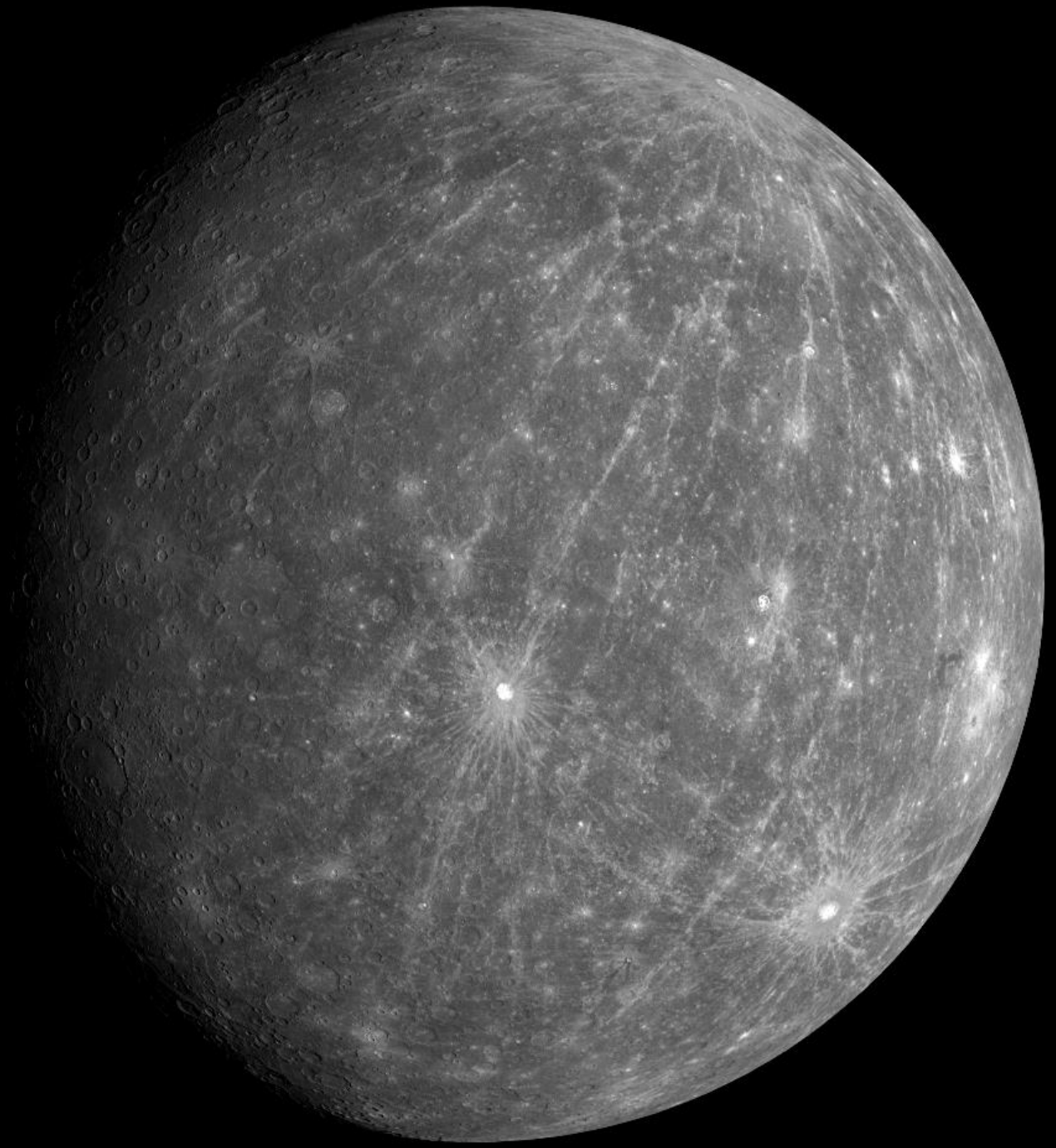
Rotation: 58 days

Orbit: 88 days

0.31-0.47 AU

Temp: -170 to 400 C

Atm: 10^{-14} bar



Venus

Radius: 6,052 km

Rotation:

-243 days

Orbit:

225 days

0.72-0.73 AU

Temp: 460C

Atm: 93 bar & 96.5% CO_2

Earth

Radius: 6,371 km

Rotation: 24h

Orbit: 1 year

0.983-1.017 AU

Temp: -89 to 57C

Atm: 1 bar

78% N_2, 21% O_2 & 0.9% Argon

Mars

Radius: 3,396 km

Rotation: 24h 36m

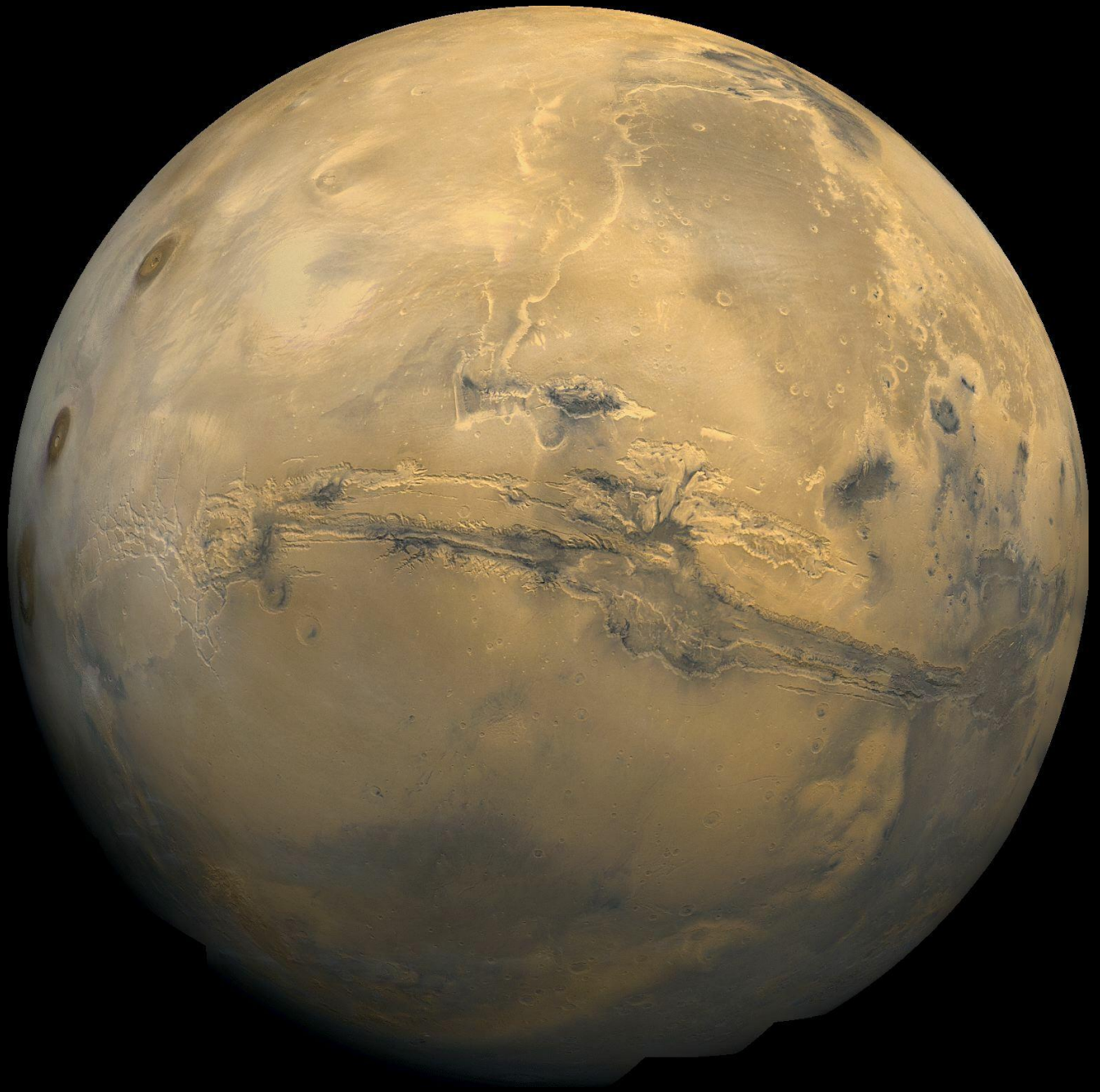
Orbit: 1.88 Earth yrs

1.38-1.67 AU

Temp: -87 to 20C

Atm: 0.006 bar

95% CO2

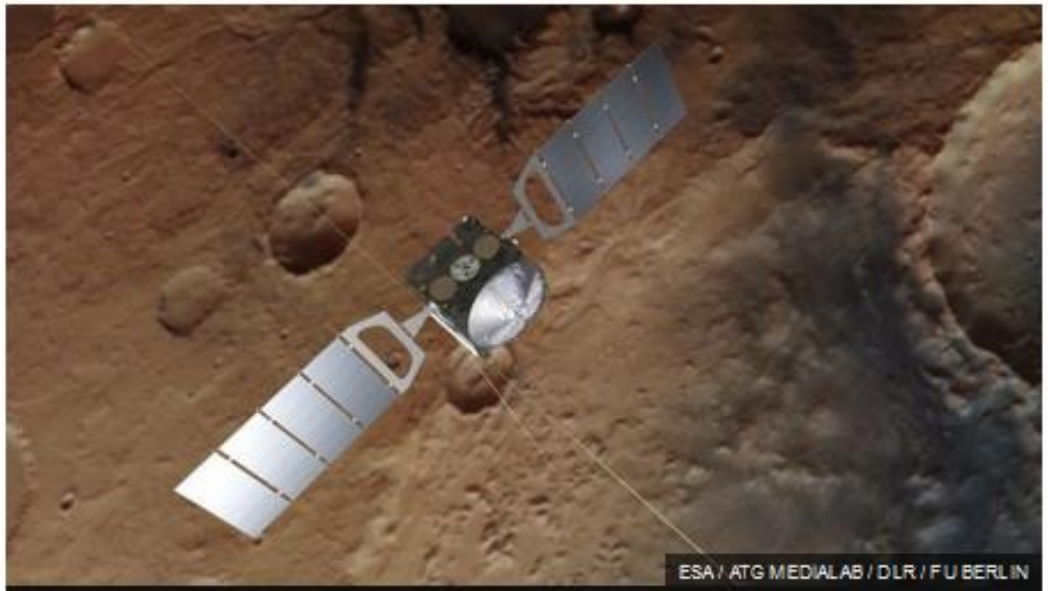


MARS

Buried lakes of liquid water discovered on Mars

By Paul Rincon
Science editor, BBC News website

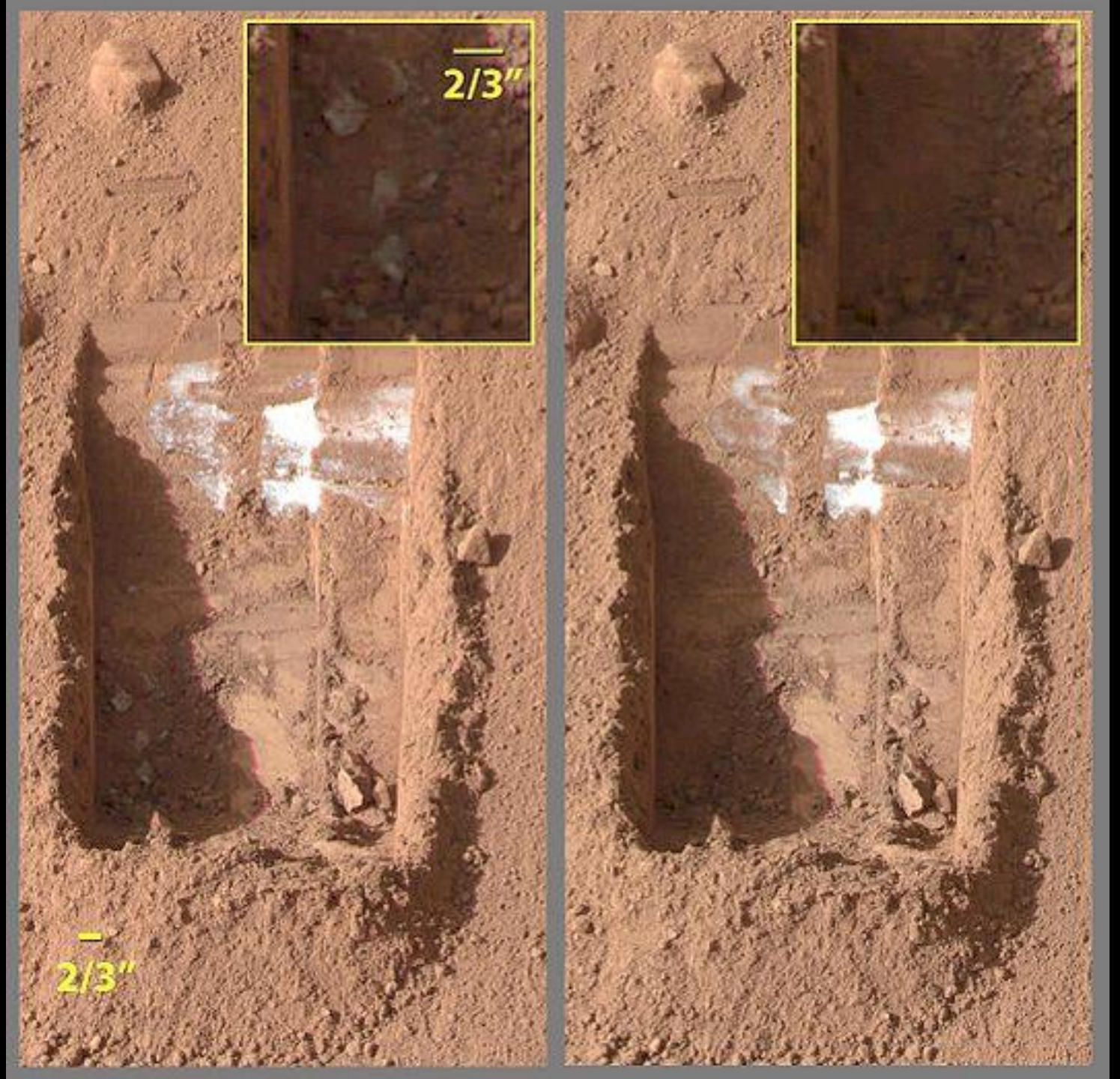
29 September 2020

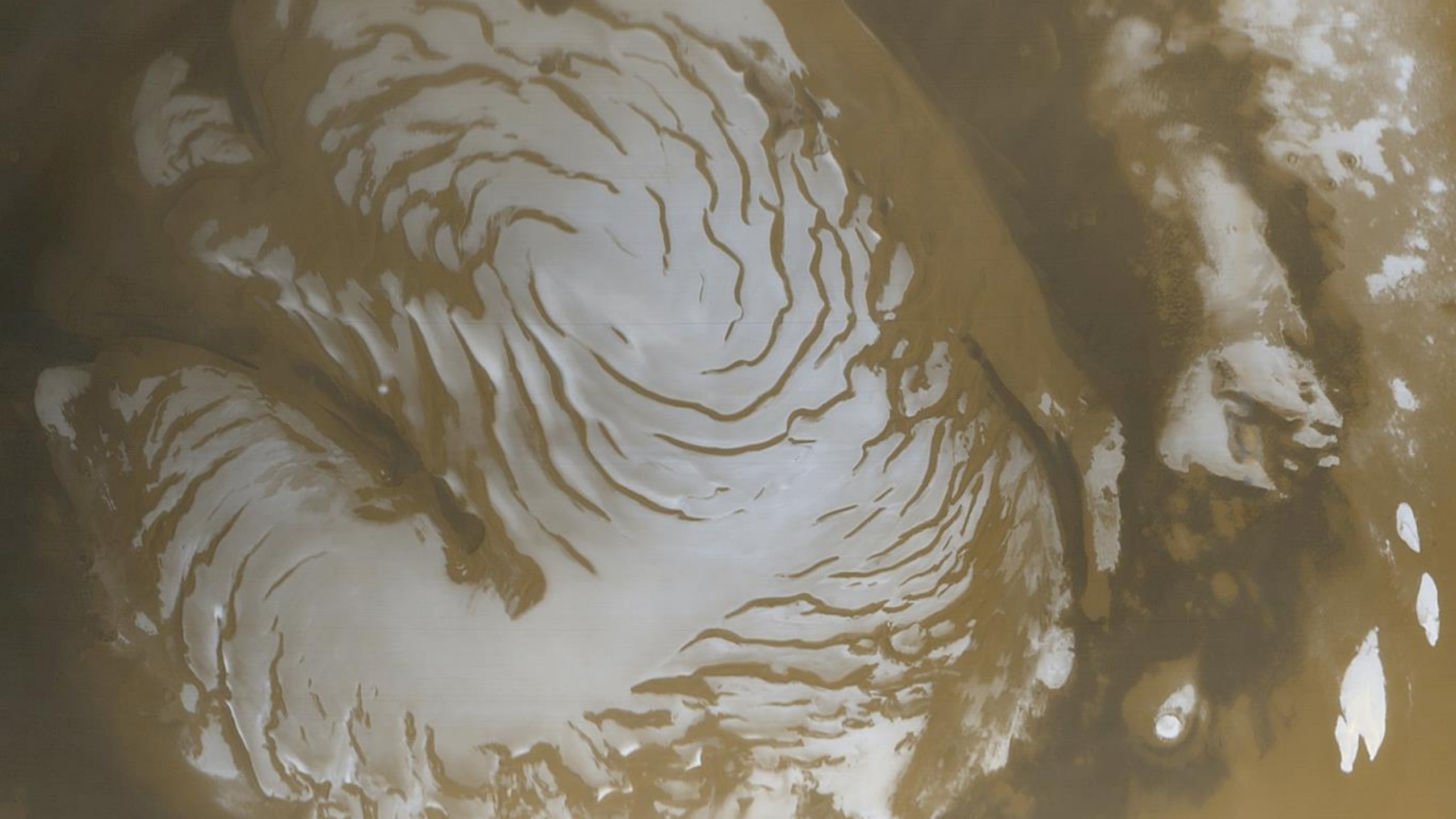


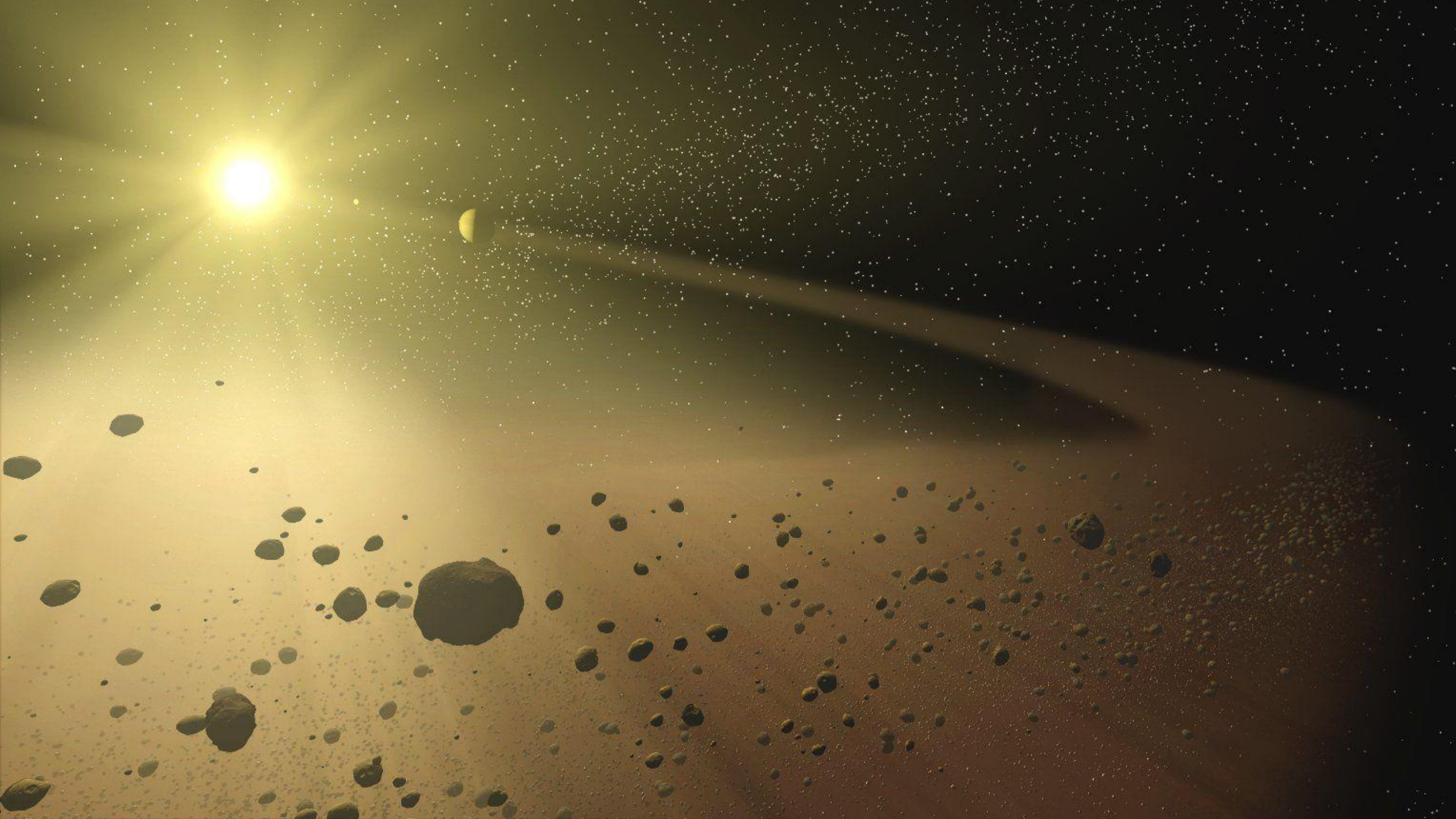
The findings come from data collected by Esa's Mars Express spacecraft

Three new underground lakes have been detected near the south pole of Mars.

Mars







Jupiter

Radius: 69,900 km

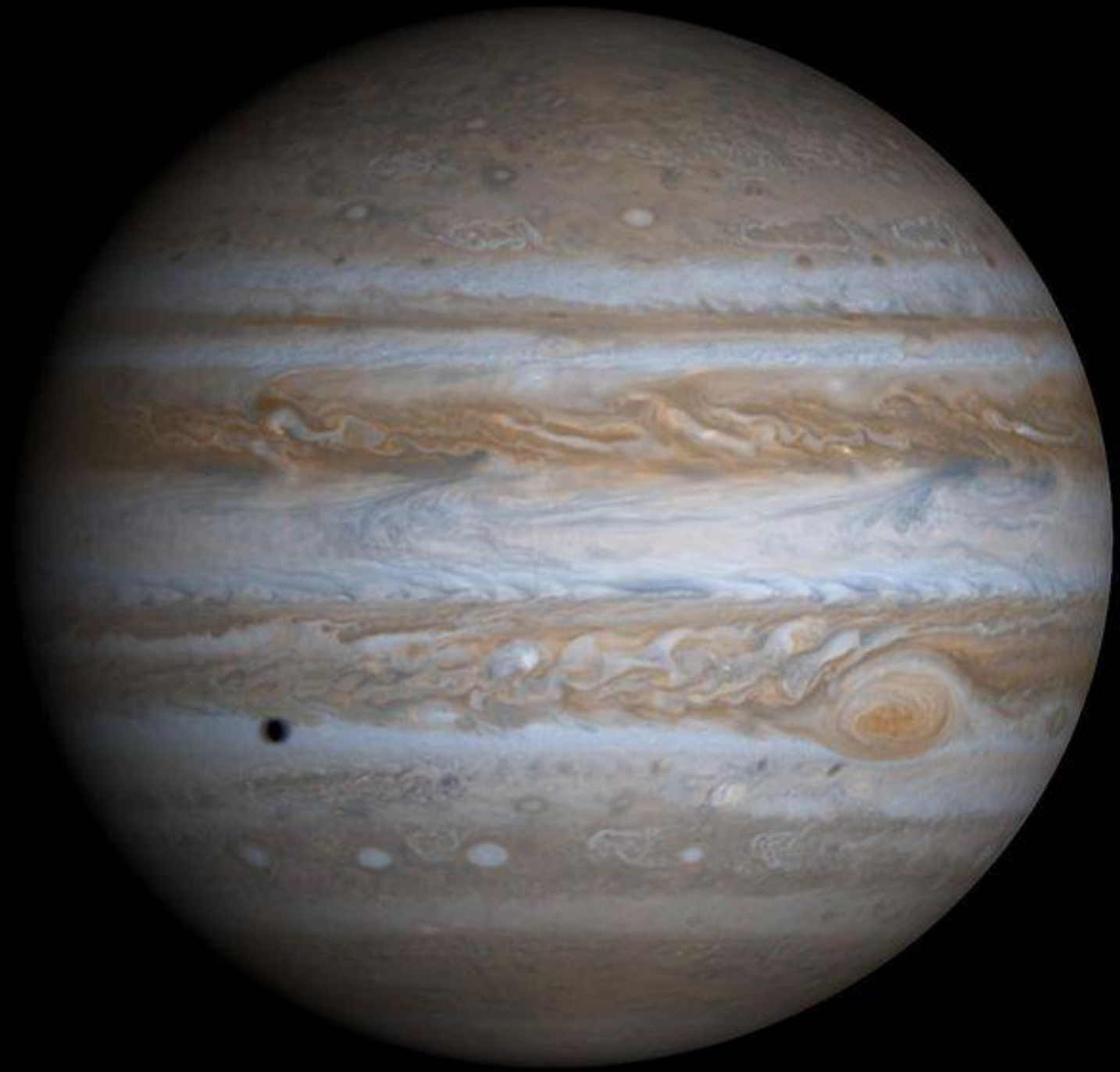
Rotation: 9h 55m

Orbit: 11.9 yrs

4.95 - 5.46 AU

Temp: >-160 C

Atm: >0.2 bar



Jupiter

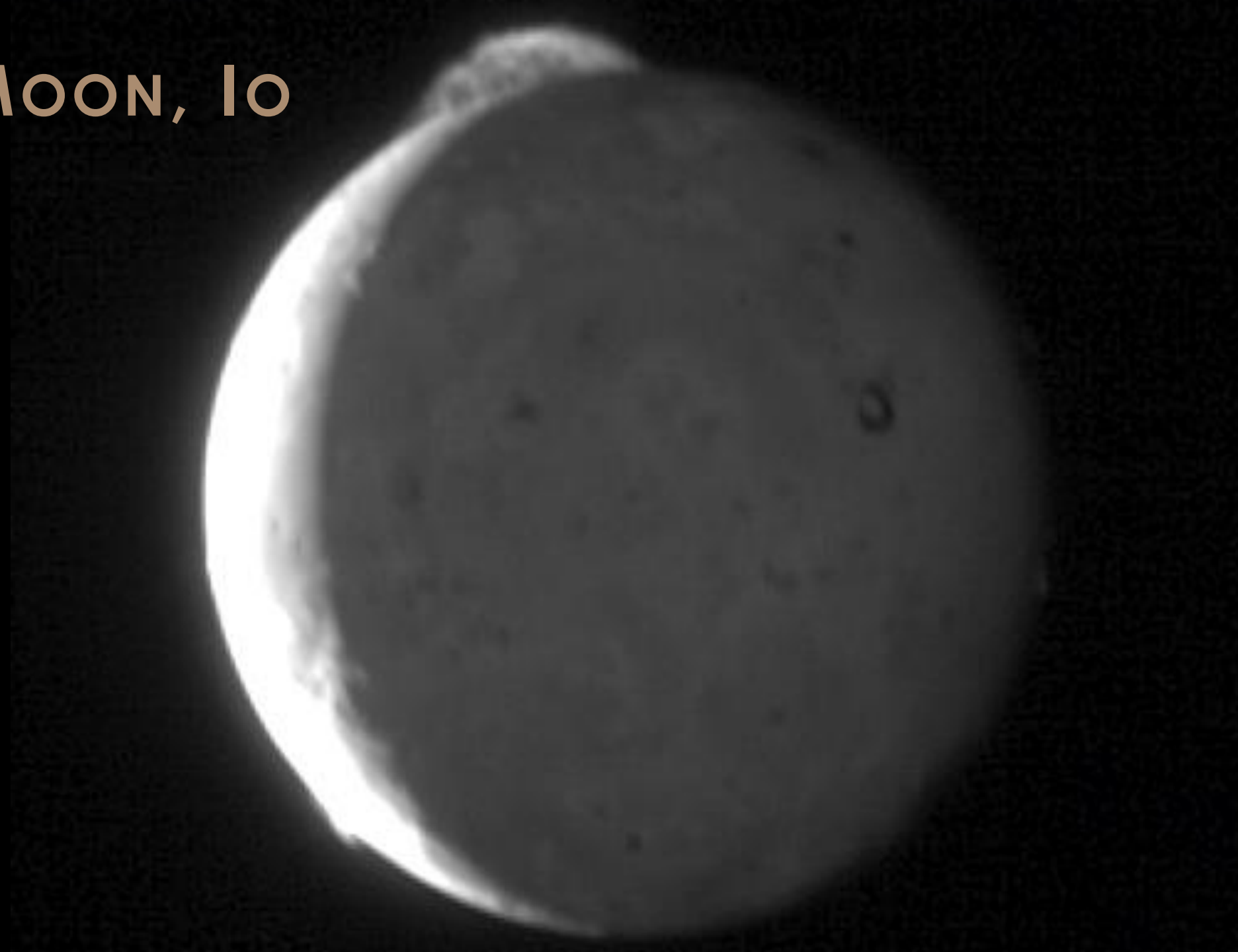
Typical view through a small telescope

Jupiter

The Galilean Moons

- the 4 largest moons of Jupiter:
  Io, Europa, Ganymede & Callisto

Jupiter's Moon, Io

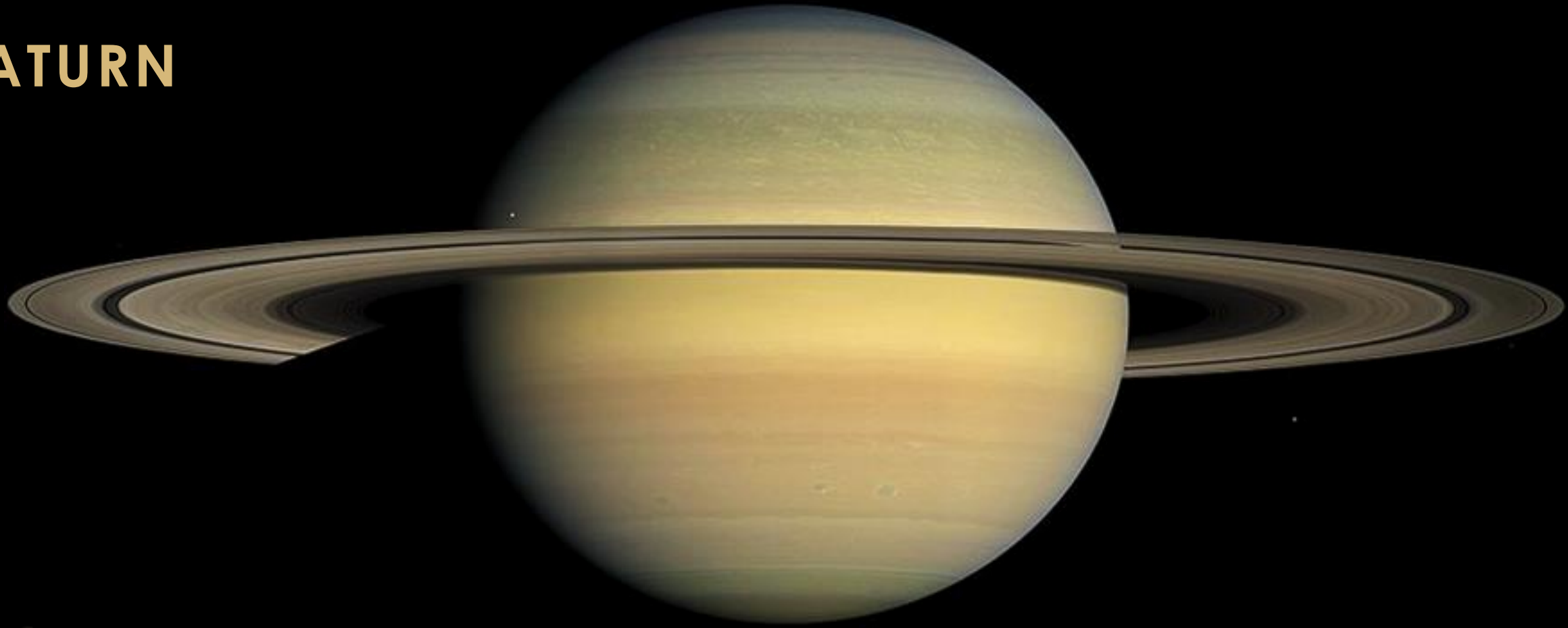


Jupiter's Moon Europa – An Ice World

Earth

Hydrothermal vents on Earth, so why not Europa?

Saturn



Radius: 60,270 km

Orbit: 29.5 yrs,

Temp: -140 C

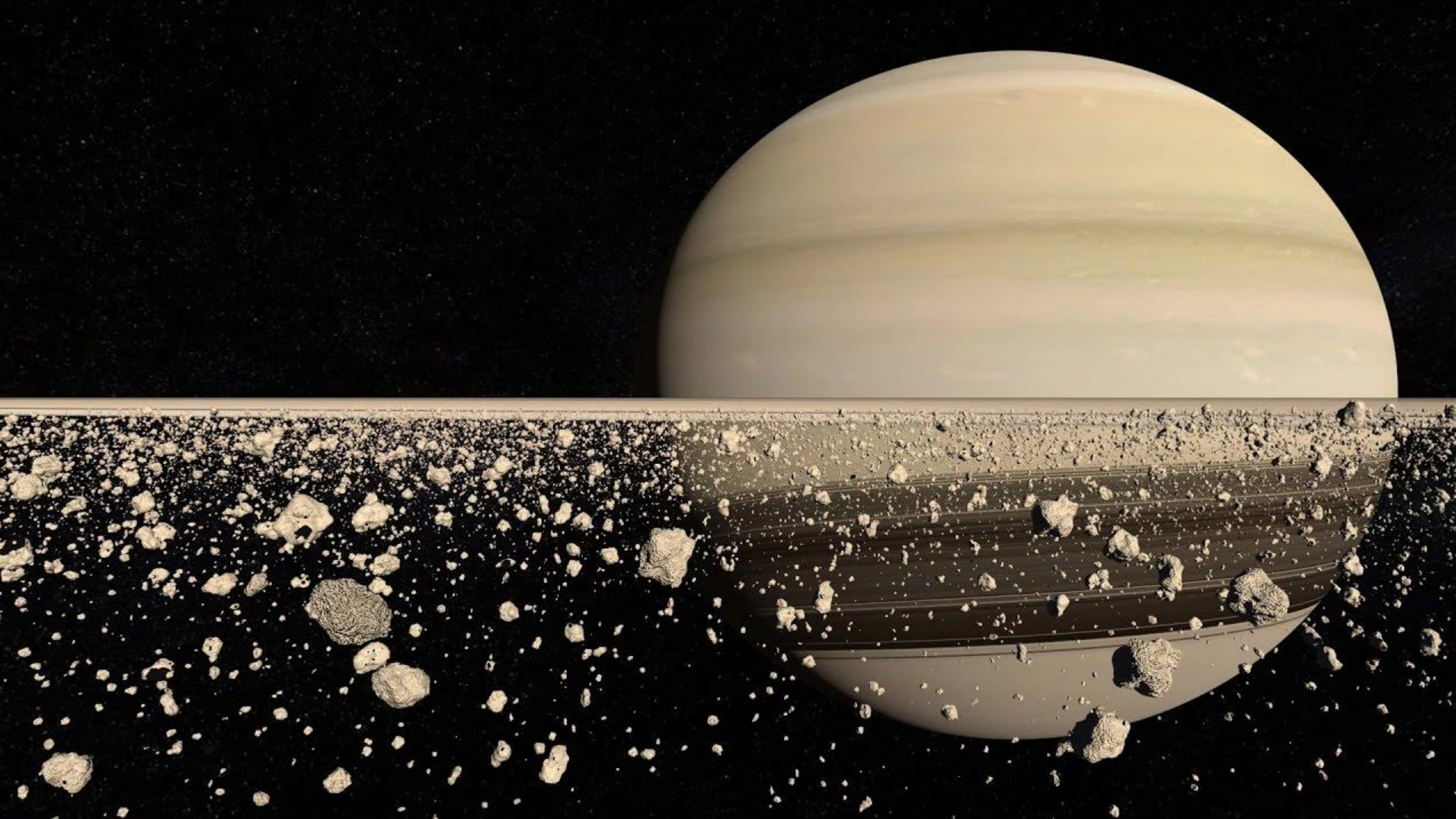
Rotation: 10h 34m

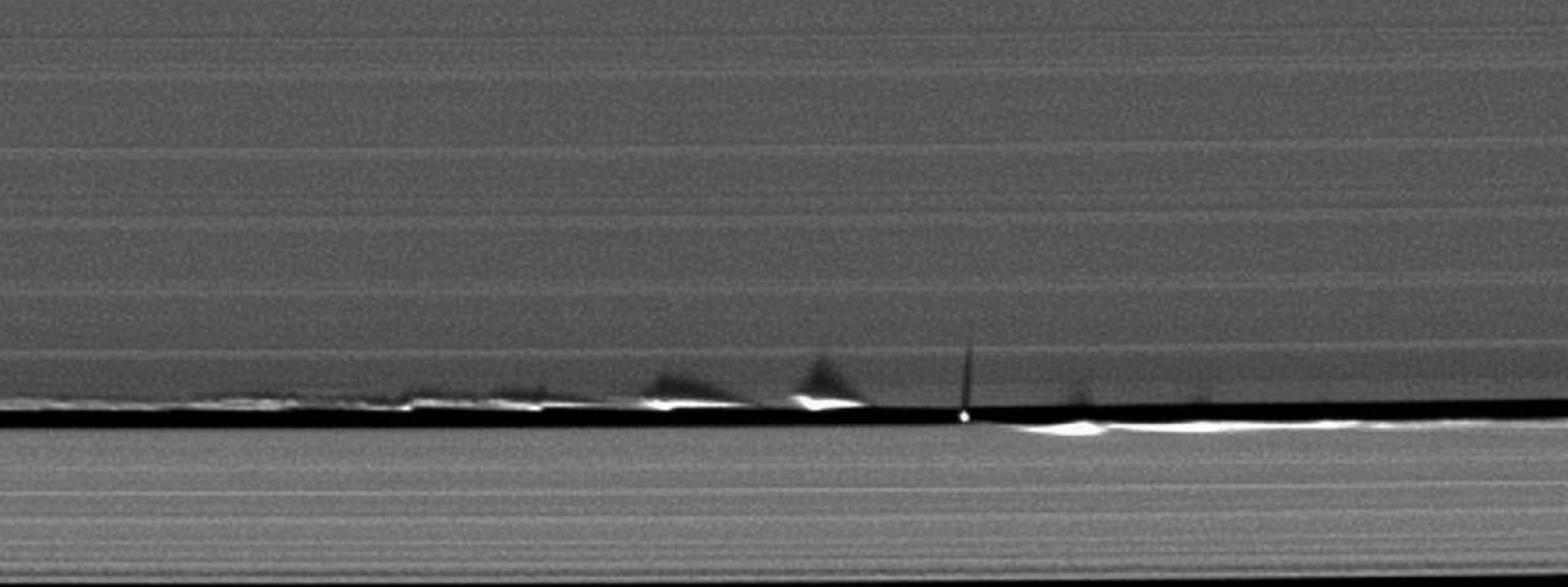
Distance from Sun: 9.1– 10.1 AU

Rings: 7,000-80,000km above Saturn & as thin as 10m

Saturn

Typical view through a small telescope





"Sheppard" moons - 8km Daphnis

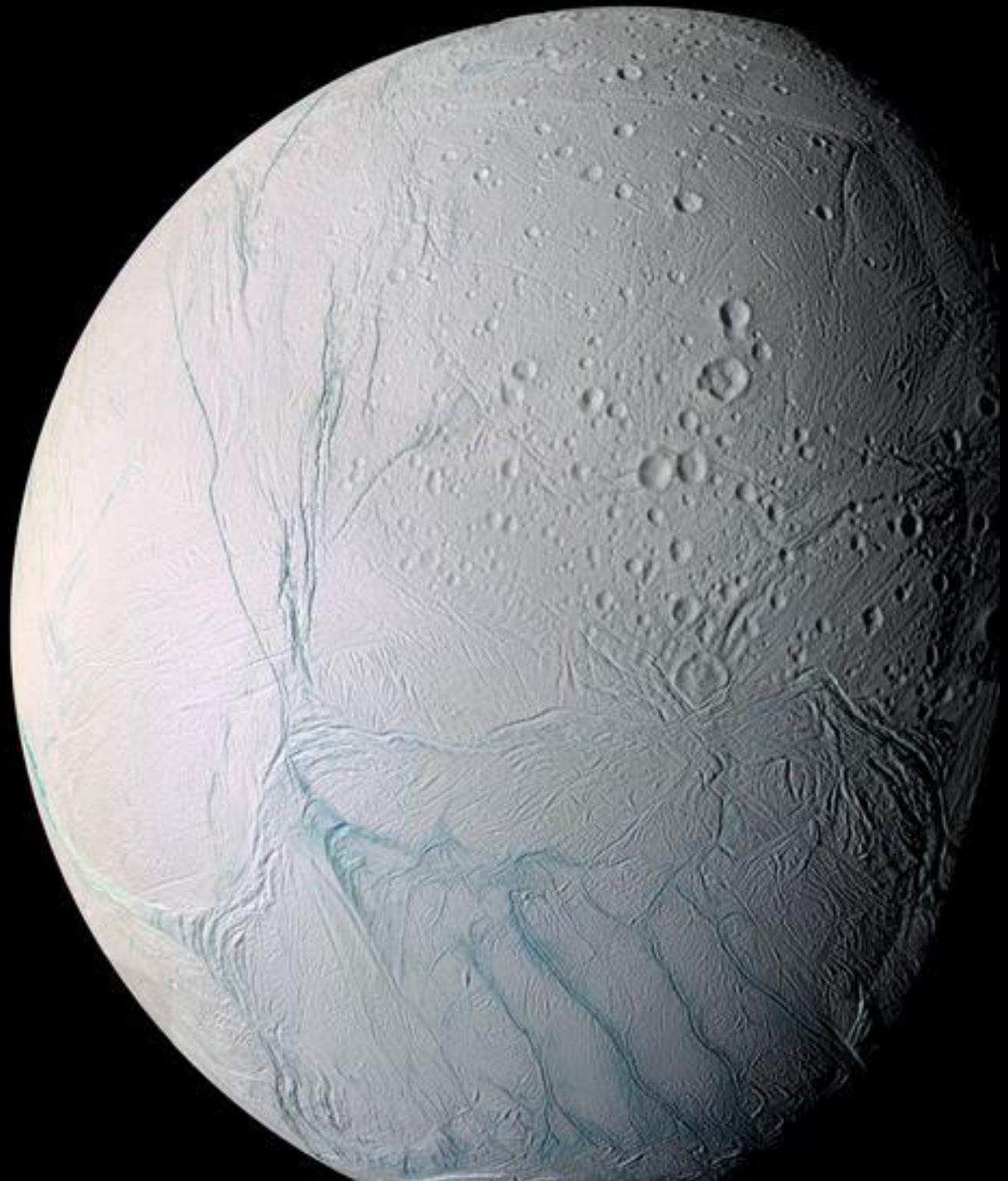
Enceladus

Radius: 250 km

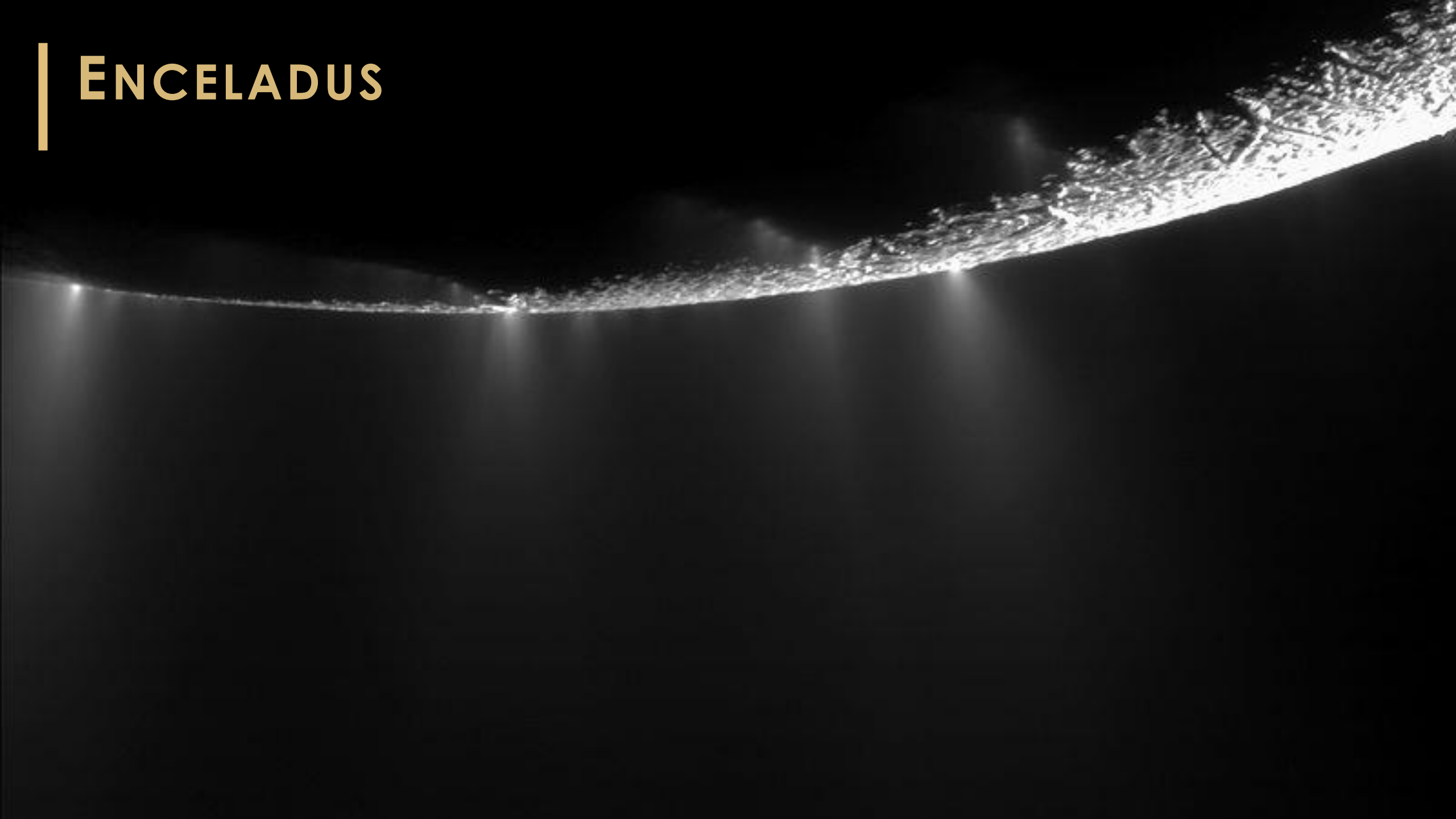
Orbit: 1.4 days

238,000km

Temp: -200 C



Enceladus



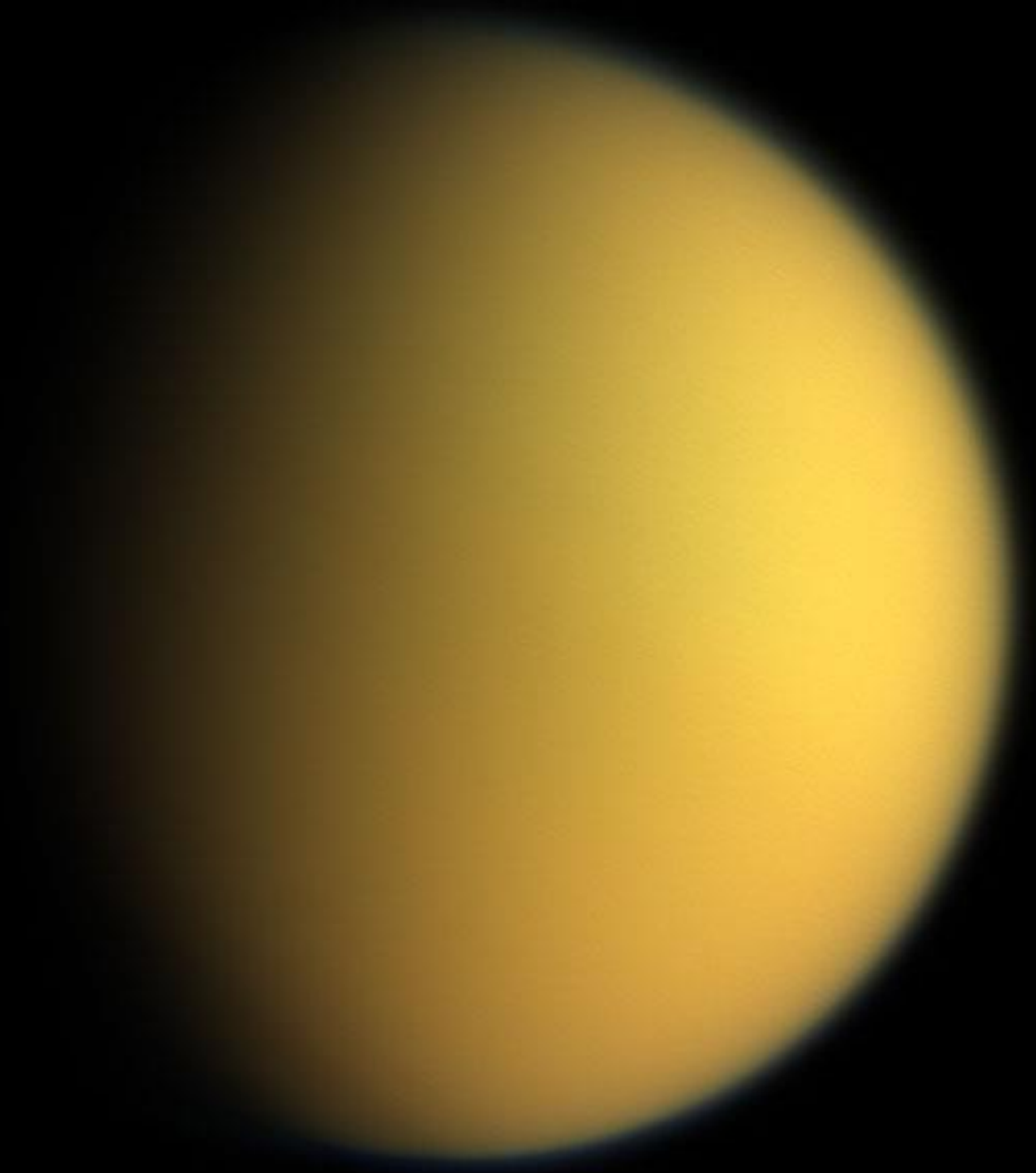
Titan

Radius: 2,576 km

Orbit: 15.9 days

1,222,000km

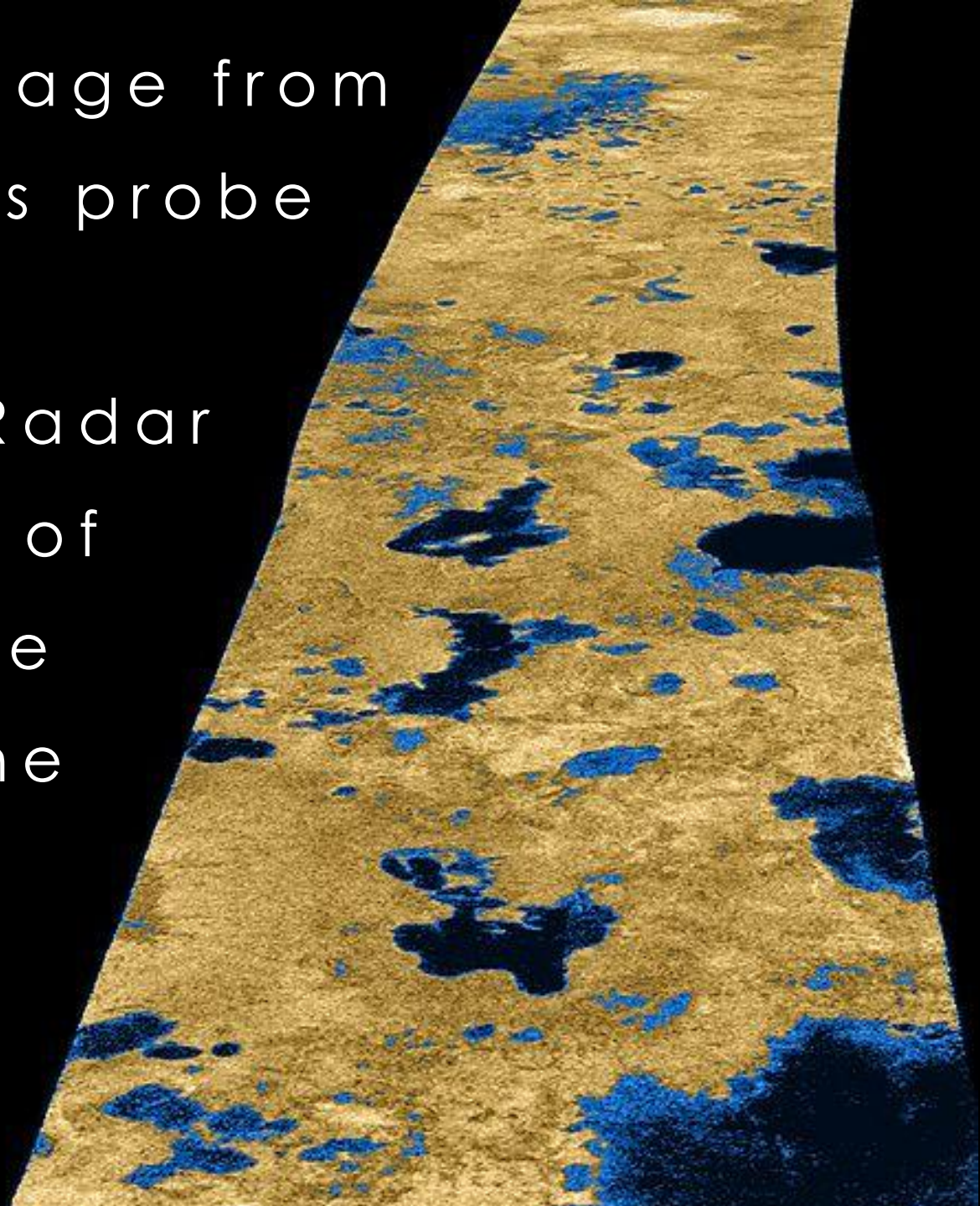
Temp: -180 C



Artistic impression of the Huygens probe landing on Titan in 2005

Left: Image from Huygens probe

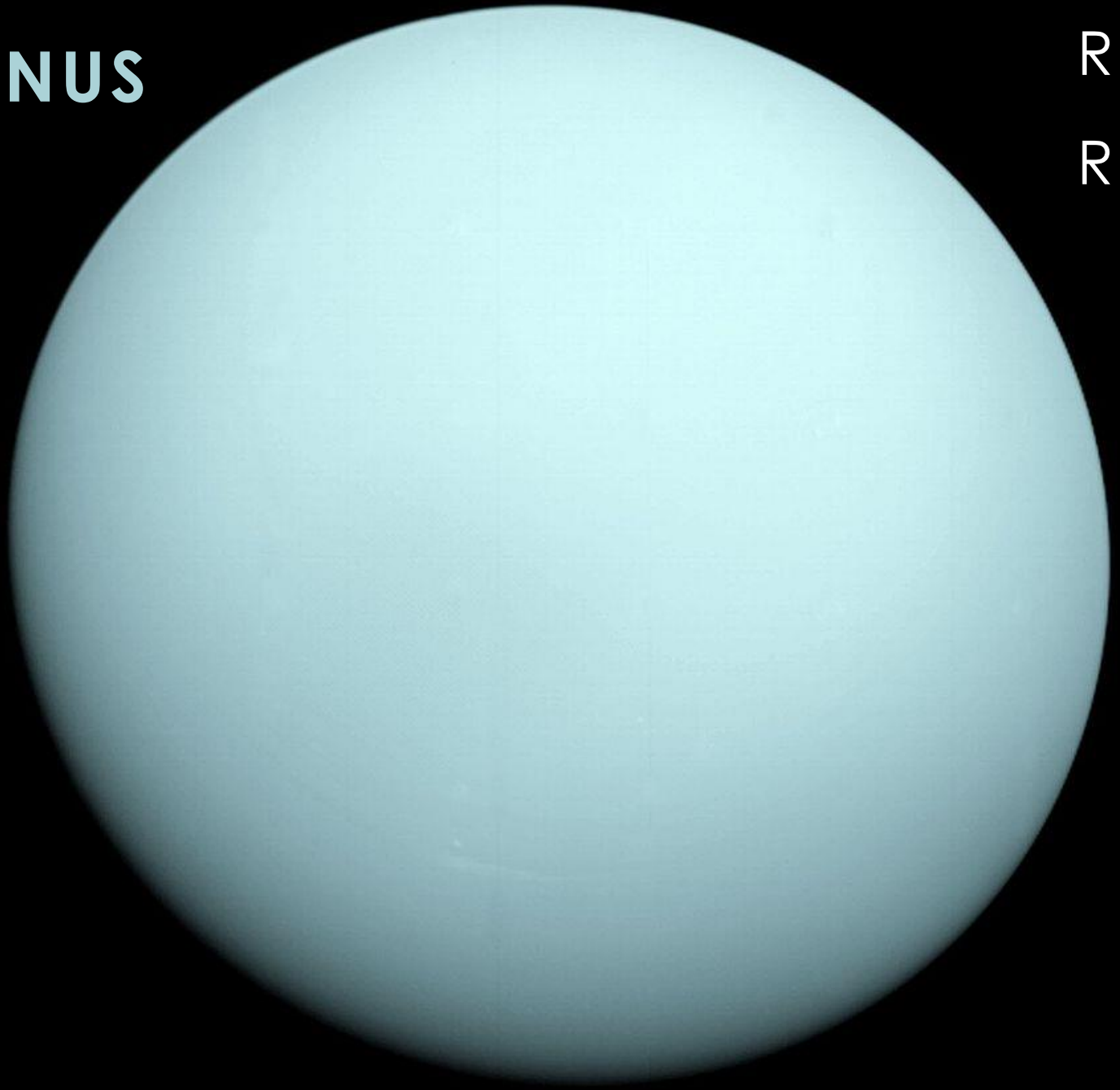
Right: Radar Images of Methane & Ethane lakes



Titan

Sunlight reflecting off a lake on Titan

Uranus



Radius: 25,559 km

Rotation: 17h 14m

Orbit: 84 yrs

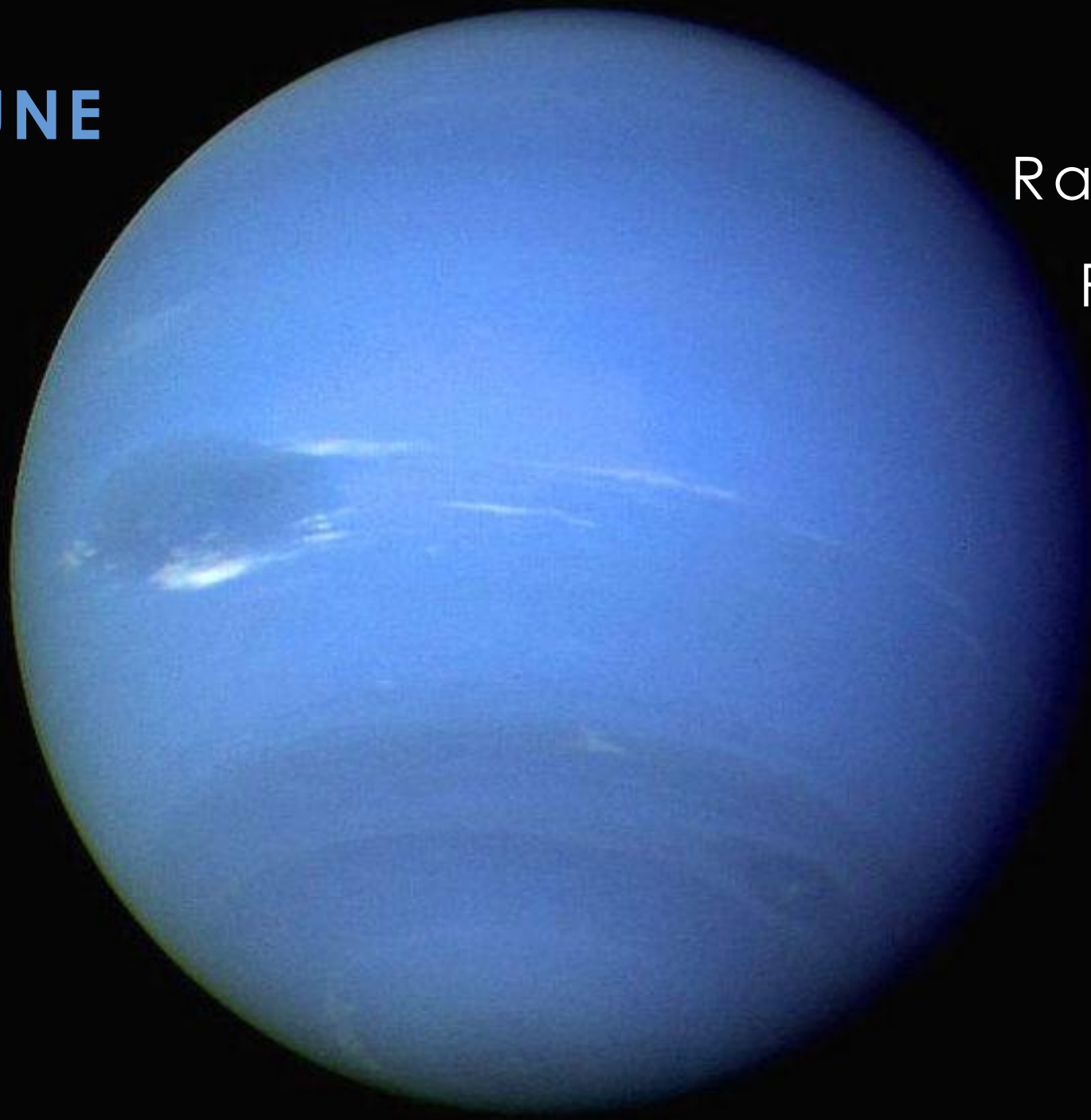
18.4 - 20.1 AU

Temp: -200 C

98° tilt

Has rings

Neptune



Radius: 24,764 km

Rotation: 16h 7m

Orbit: 165 yrs

29.8-30.3 AU

Temp: -200 C

Measuring the solar system – **with time**

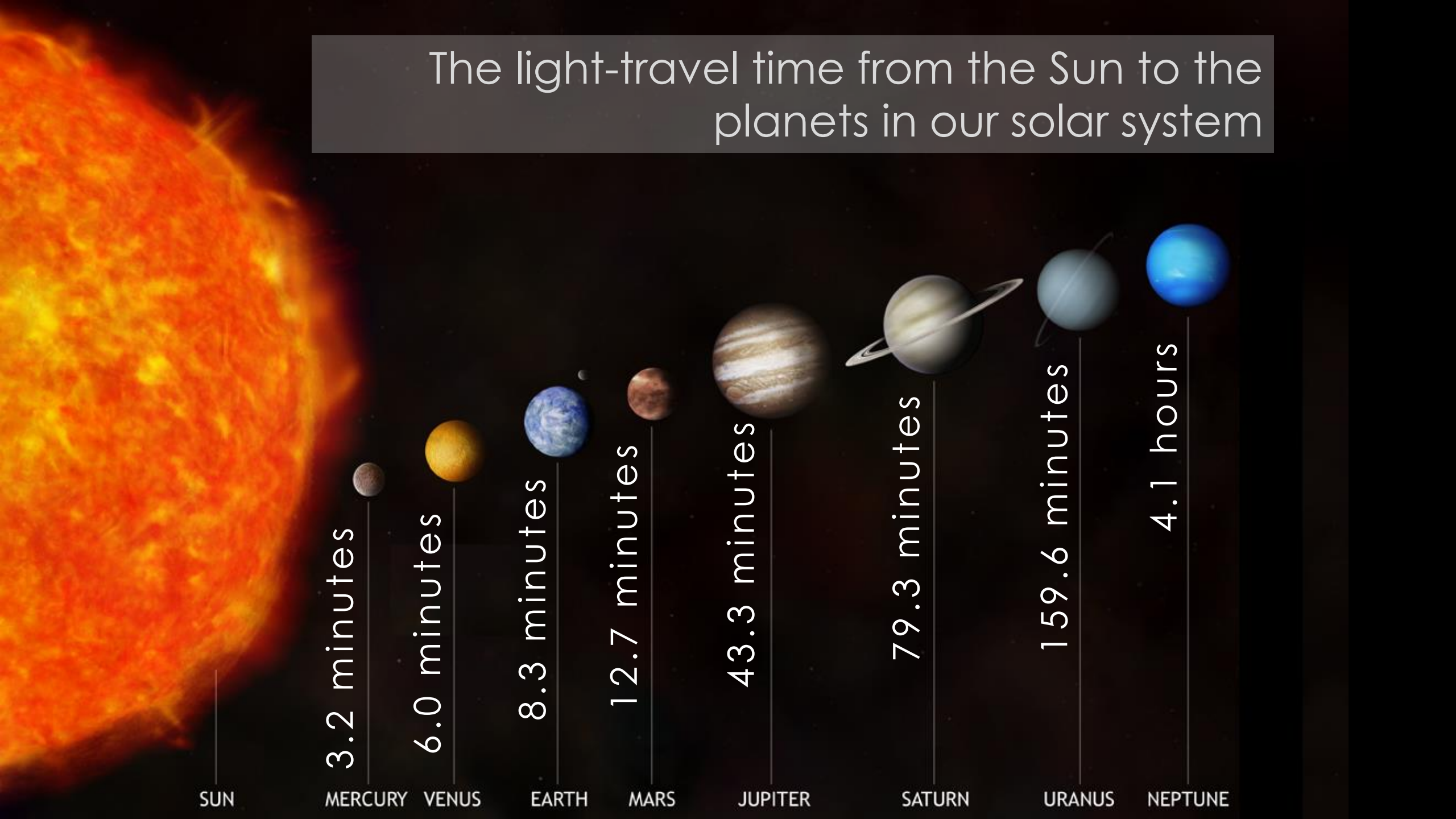
Light travels
1 meter in 3.3ns

The Moon
is 1.3 light-seconds away

The Sun

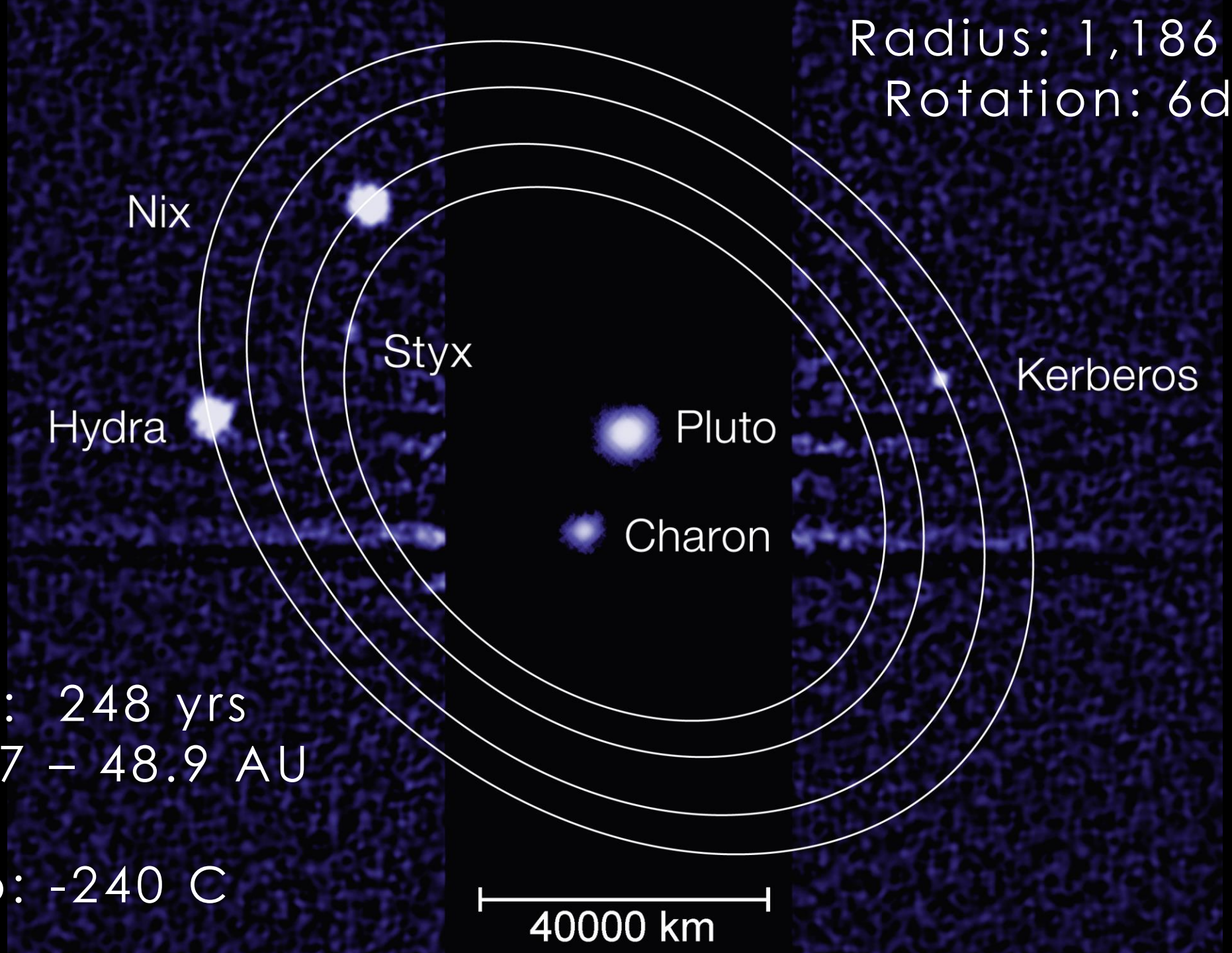
8 light-minutes (and 19 seconds) away

The light-travel time from the Sun to the planets in our solar system



Pluto

Radius: 1,186 km
Rotation: 6d 9h



Orbit: 248 yrs
29.7 – 48.9 AU

Temp: -240 C

Pluto

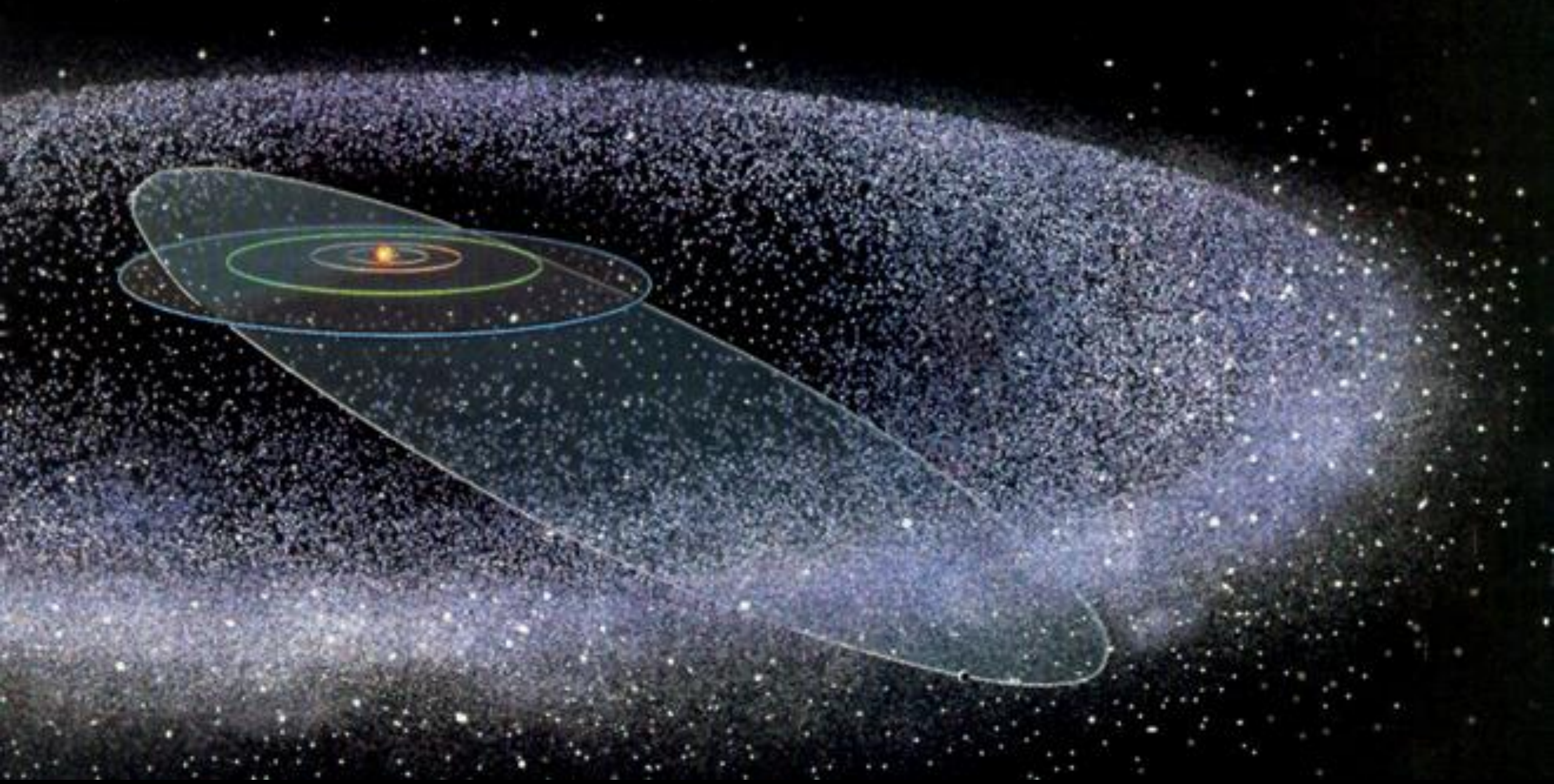
New Horizons Probe

Flyby in July 2015

- Plains
- 80km high haze
- Nitrogen Ice Flows
- 3,500m high ice mountains
- Pluto's radius 1,186km
- "Heart" is geologically young

Pluto is NOT a planet for FOUR reasons...

Haumea



Kuiper belt – 1000 objects currently known, at 30-50 AU

Comets

Comet C/2020 F3 (NEOWISE)
Over Stanmer Park, July 2020

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Astronomy Voyage

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