NASA’s Most Beautiful Photographs – from Mercury to Pluto

Systems Engineering Division 3100
Presented by: Shaun Standley, Principal Engineer
CL#xx-xxxx

Jet Propulsion Laboratory
California Institute of Technology

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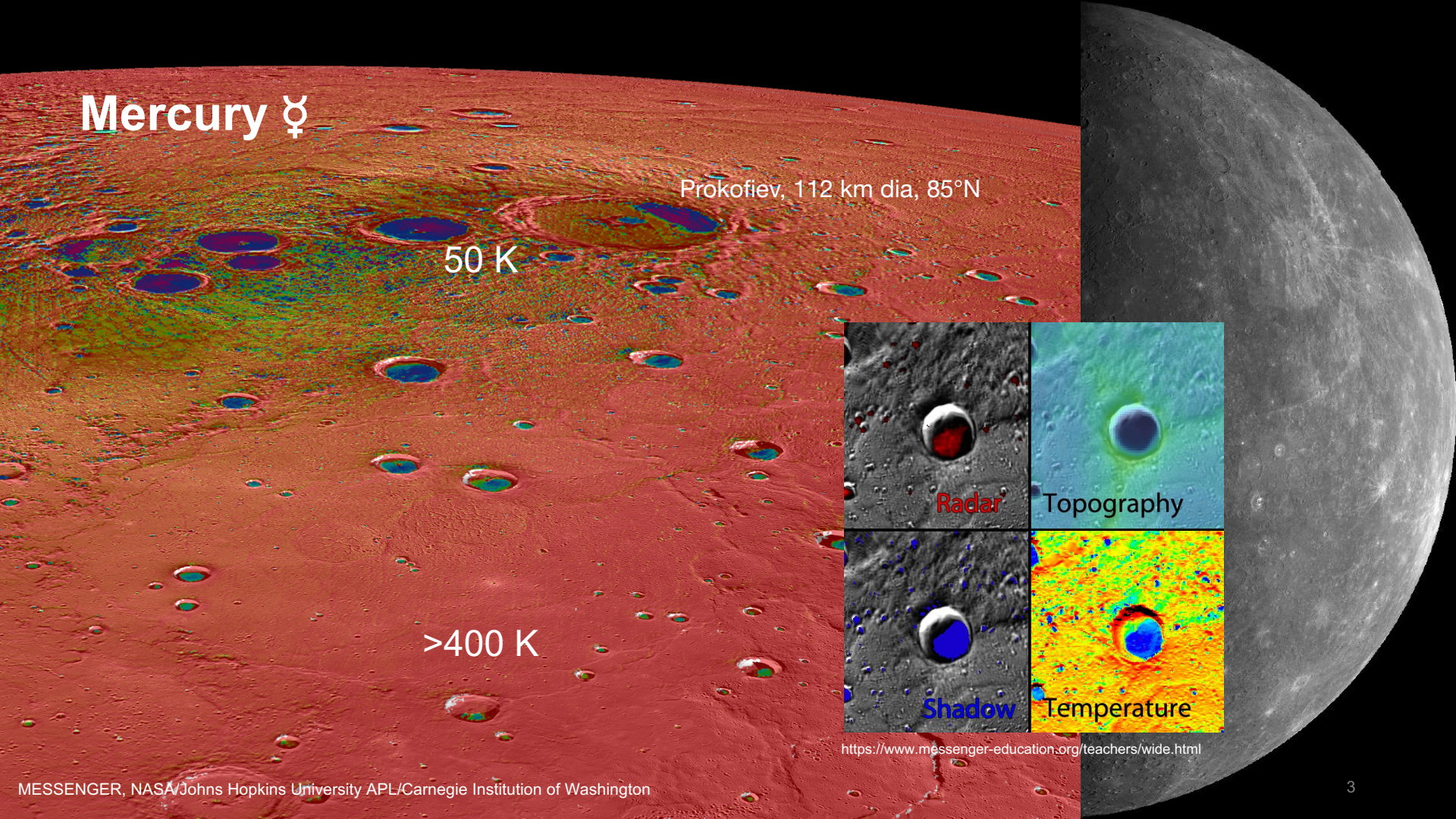
Mercury ☿

- Smallest planet
- One day on Mercury takes 59 Earth days.
- Mercury makes a complete orbit around the Sun in 88 Earth days.
- Surface temperature 430°C to -180°C.
- Tidally locked with the Sun in a 3:2 spin-orbit resonance

Mariner 10, NASA/JPL

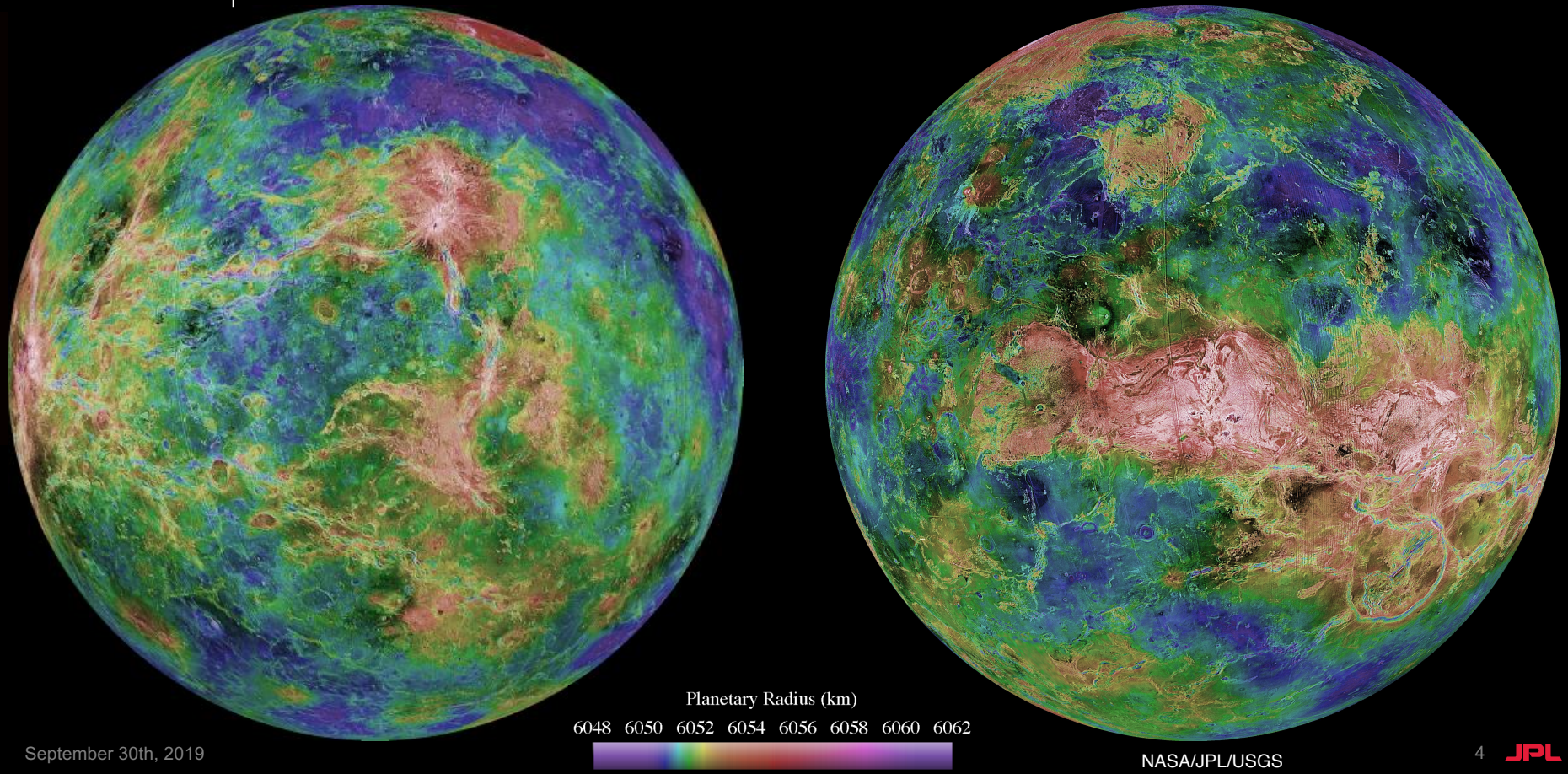
Mercury ☿



https://www.messenger-education.org/teachers/wide.html

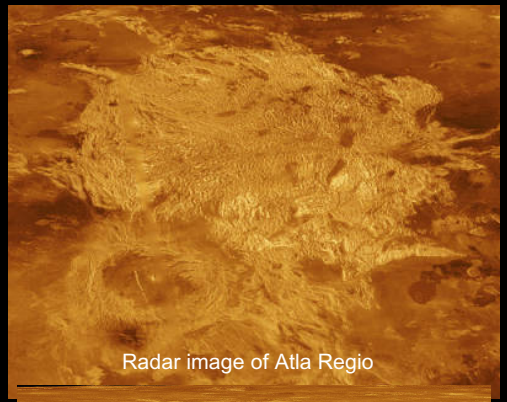
MESSENGER, NASA/Johns Hopkins University APL/Carnegie Institution of Washington

Venus ♀

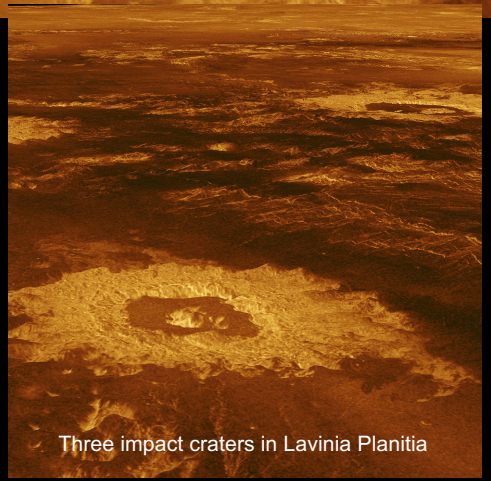


NASA/JPL/USGS

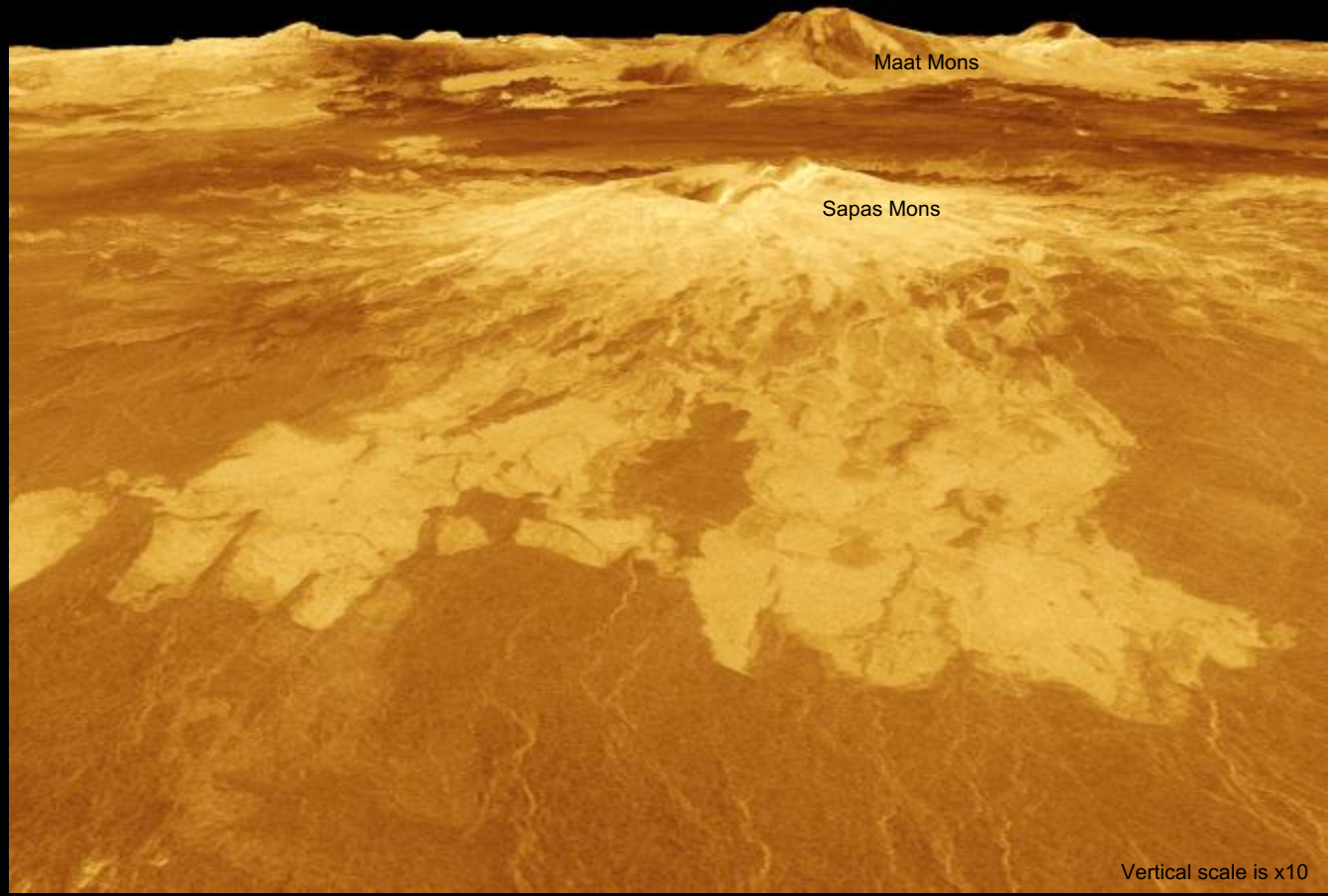
Venus ♀



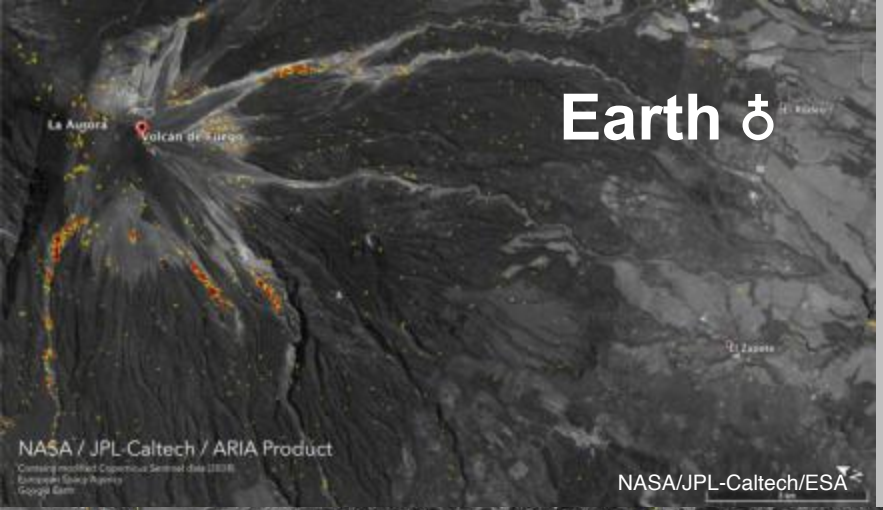
Radar image of Atla Regio



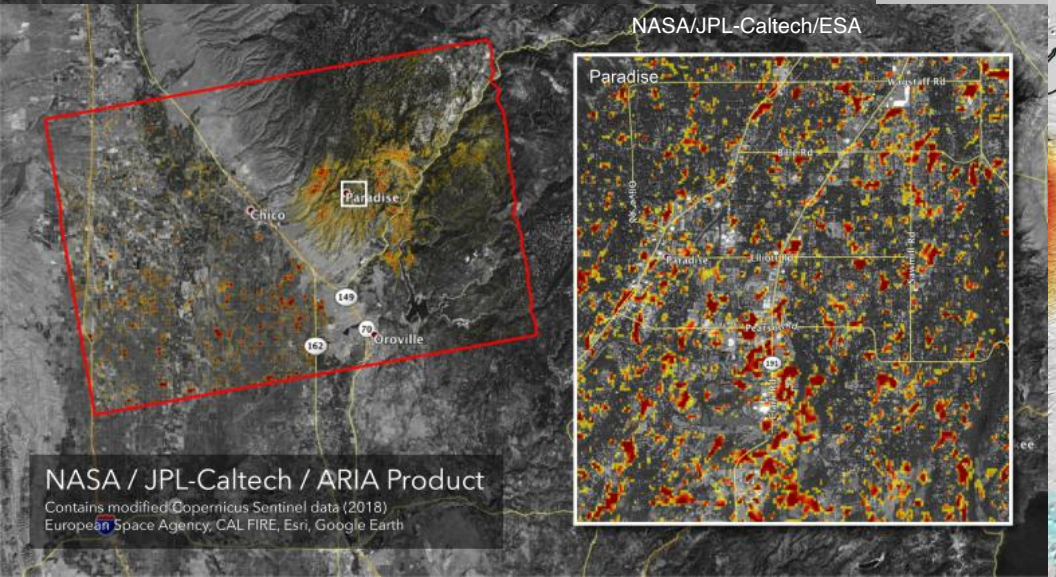
Three impact craters in Lavinia Planitia



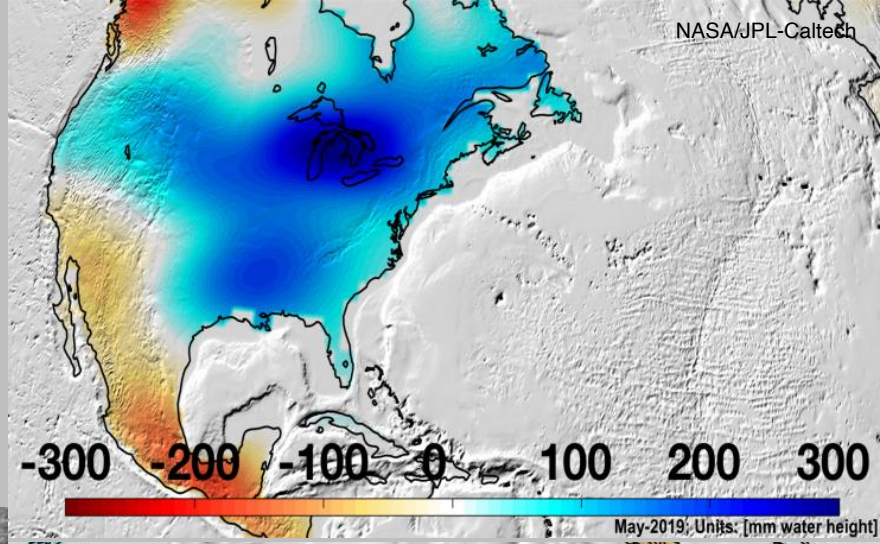
Earth ♁

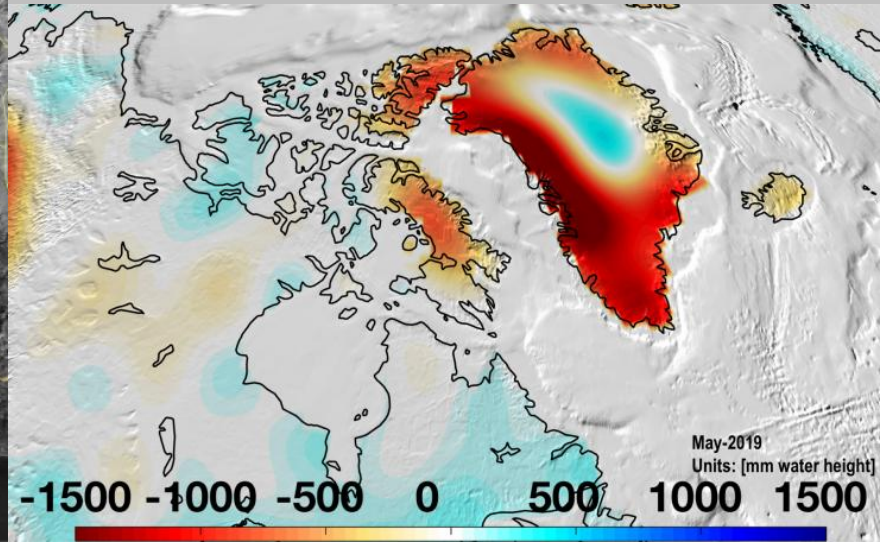


NASA/JPL-Caltech/ESA

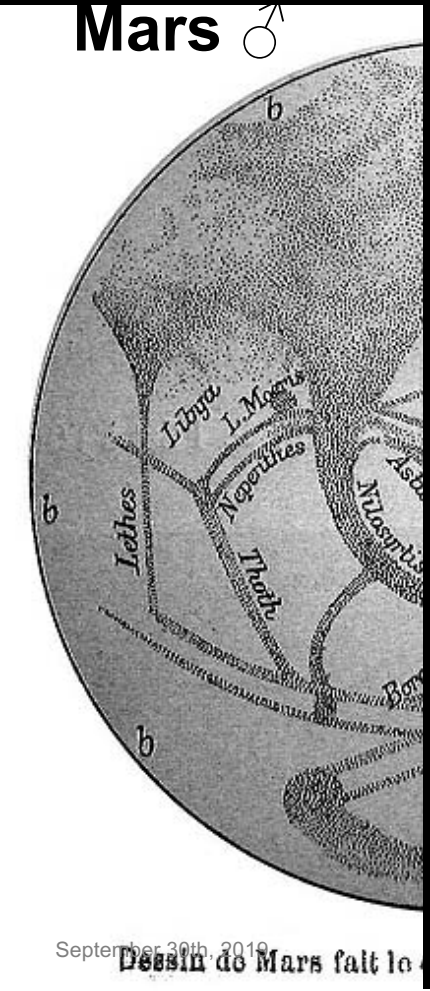


NASA/JPL-Caltech/ESA





Mars ♂

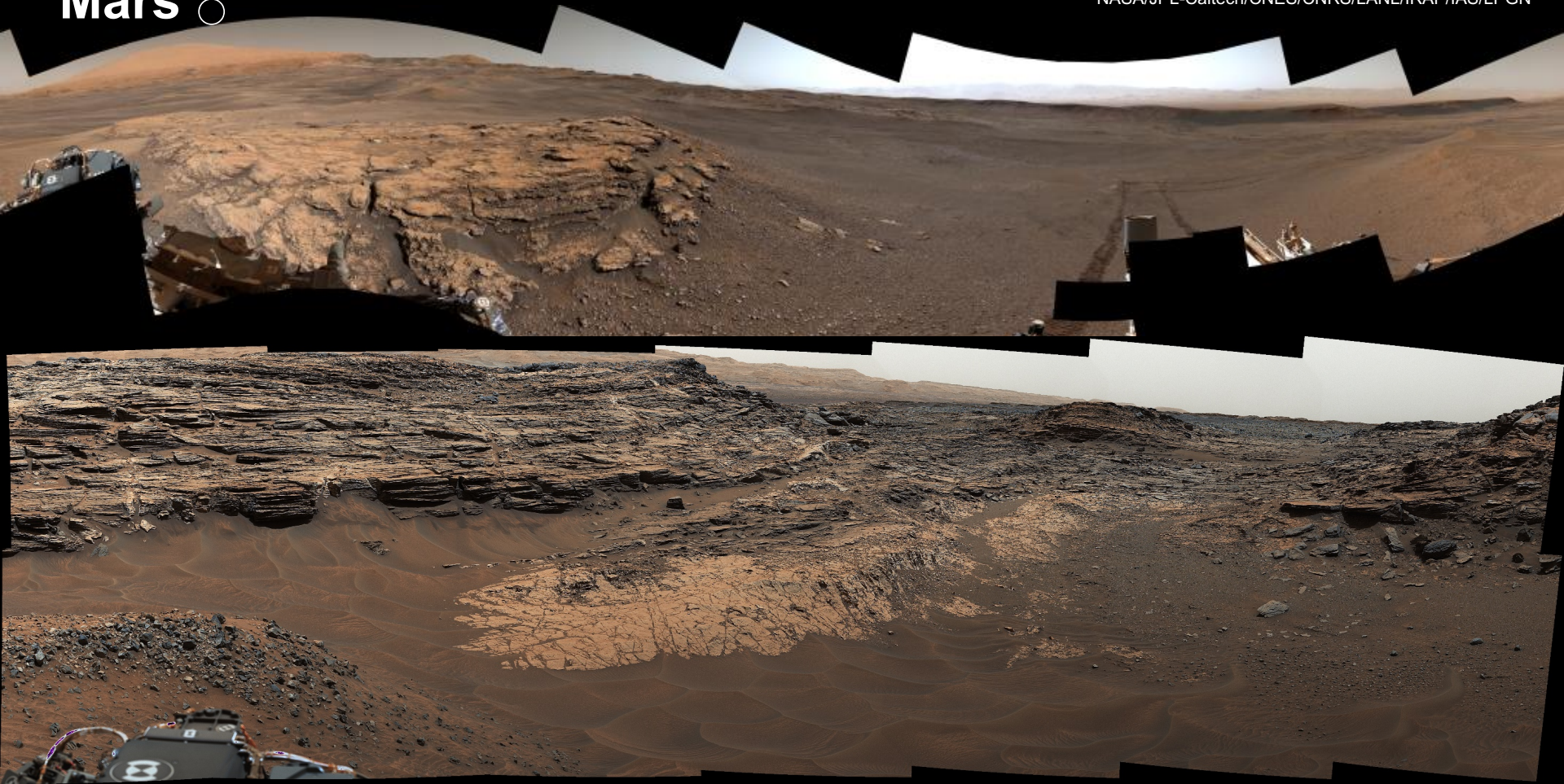


John Mellish November 1915 Clark refractor at Yerkes Observatory

Viking Orbiter 1 Visual Imaging Subsystem - Camera A NASA/USGS

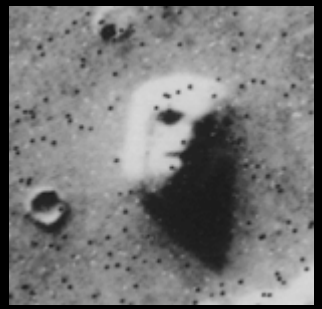
Mars ♂

NASA/JPL-Caltech/CNES/CNRS/LANL/IRAP/IAS/LPGN

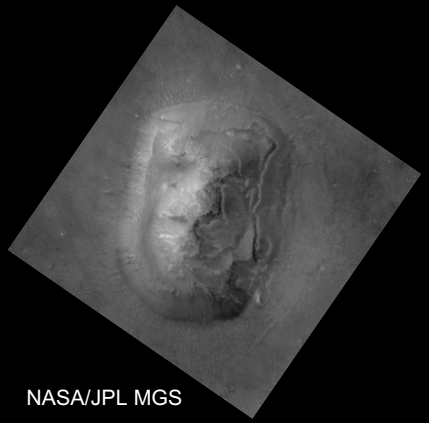


Mars ♂

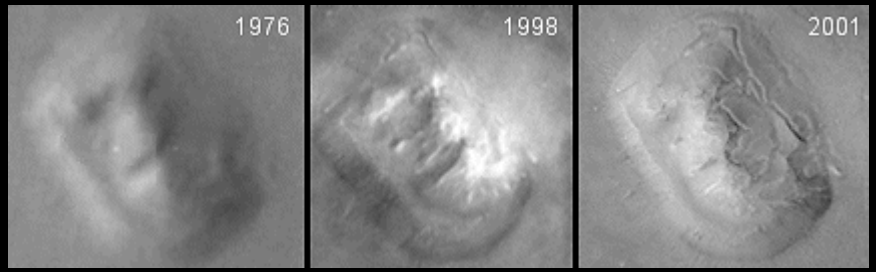
See “Unmasking the Face on Mars”
https://science.nasa.gov/science-news/science-at-nasa/2001/ast24may_1/



NASA/USGS Viking 1
PIA01141.tif (316.9 kB)
Cydonia

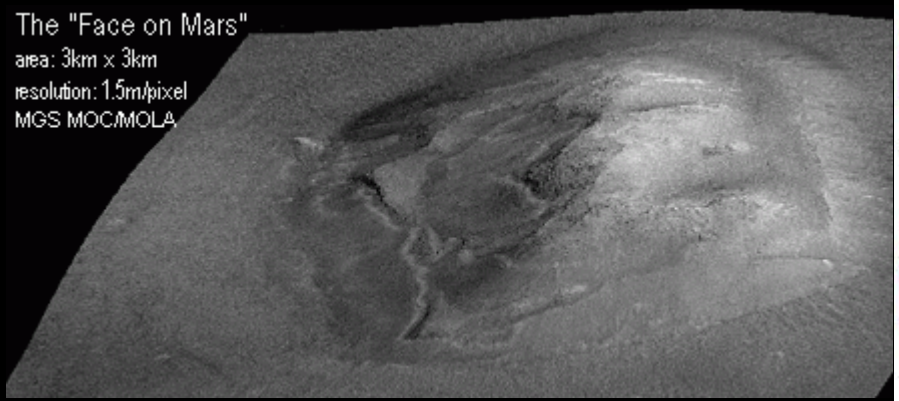


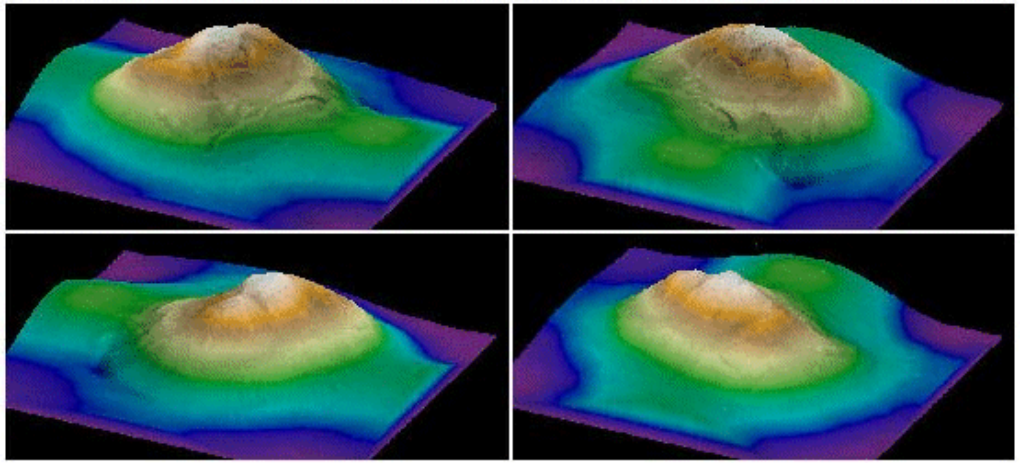
NASA/JPL MGS



Viking 43m/pixel

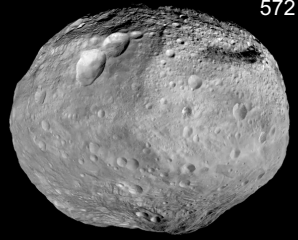
Mars Global Surveyor 1.56m/pixel





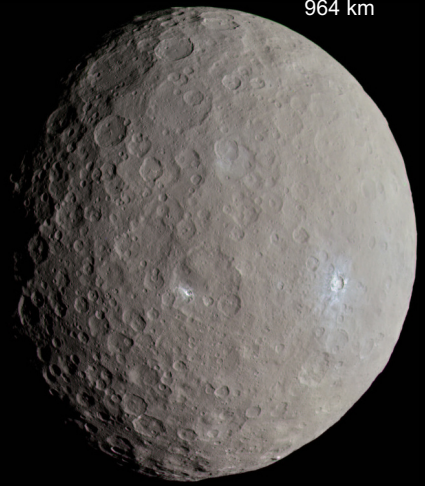
Above: Four views of the "Face on Mars." Jim Garvin (NASA) and Jim Frawley (Herring Bay Geophysics) combined MGS laser altimeter data with high resolution MOC images to produce these 3D images in which color represents height. The peak of the mesa-like landform rises 800 feet above the surrounding plain.

Asteroids



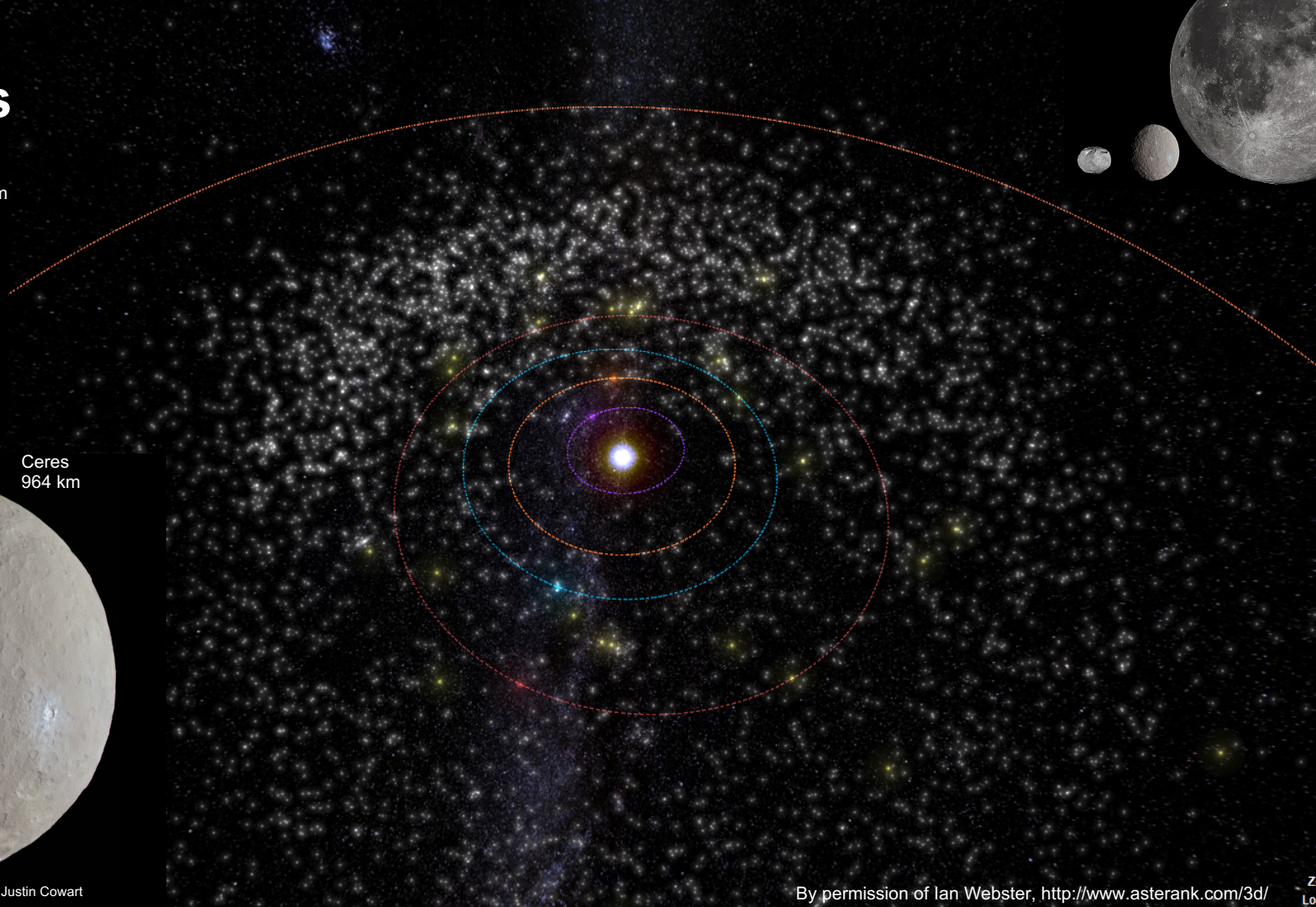
Vesta
572 km

NASA/JPL



Ceres
964 km

NASA / JPL-Caltech / UCLA / MPS / DLR / IDA / Justin Cowart



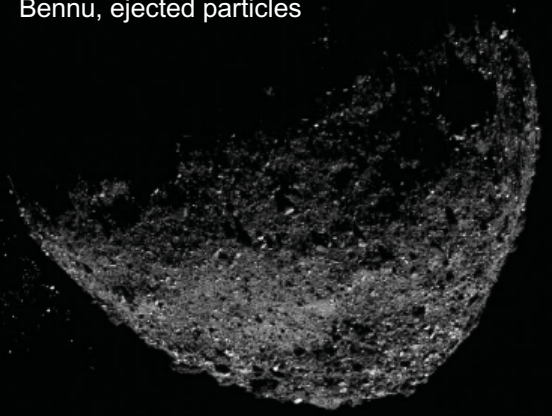
By permission of Ian Webster, http://www.asterank.com/3d/

Asteroids

243 Ida and its satellite Dactyl

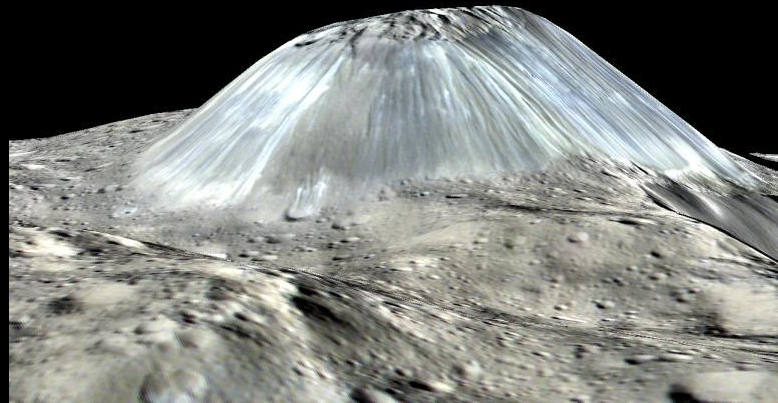
NASA / JPL

Bennu, ejected particles



NASA/Goddard/University of Arizona/Lockheed Martin

Ahuna Mons, Ceres

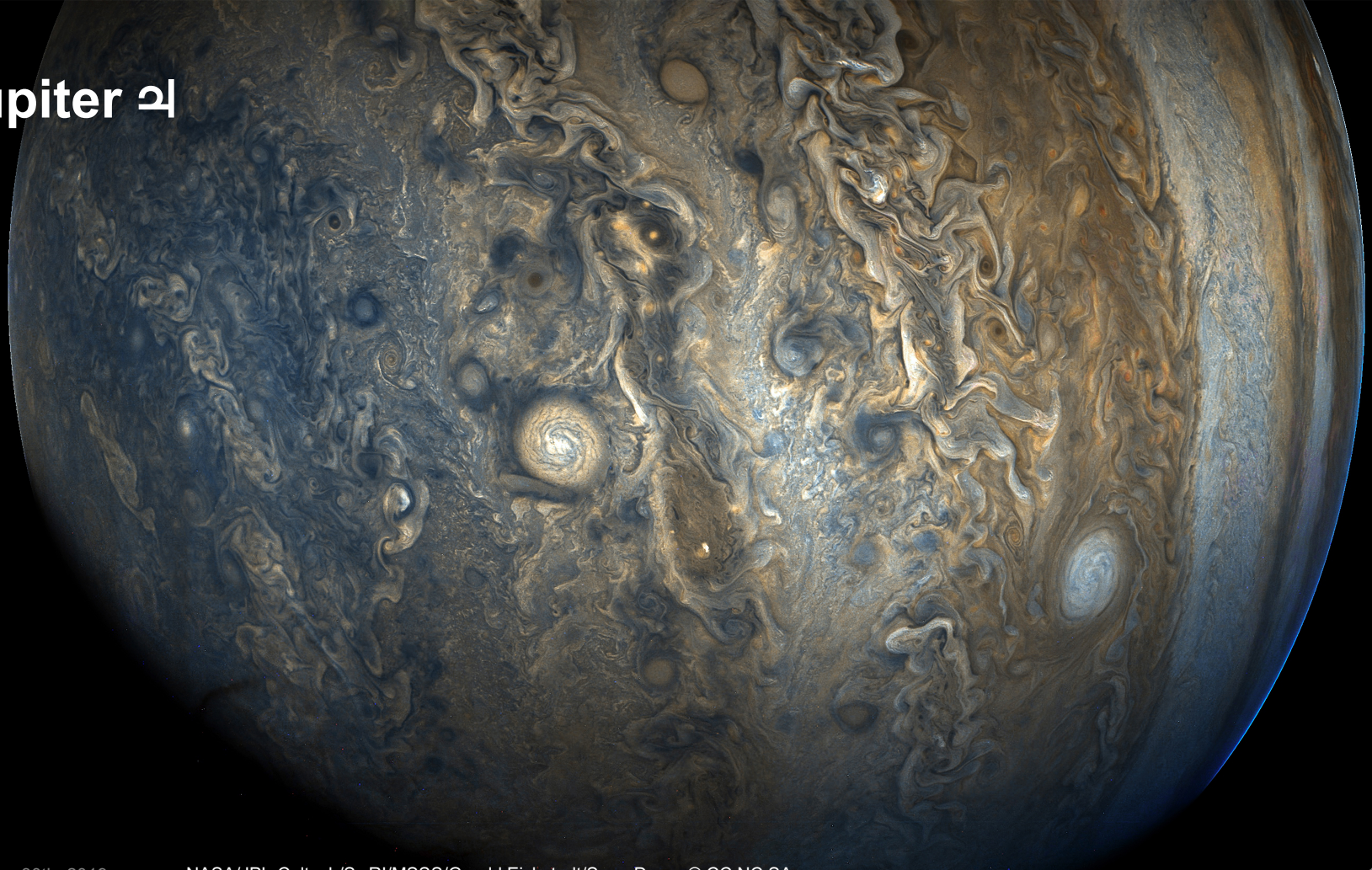


NASA / JPL-Caltech / UCLA / MPS / DLR / IDA

Jupiter 의

Kevin M. Gill using NASA/JPL-Caltech/SwRI/MSSS raw images

Jupiter 의



NASA/JPL-Caltech/SwRI/MSSS/Gerald Eichstadt/Sean Doran © CC NC SA

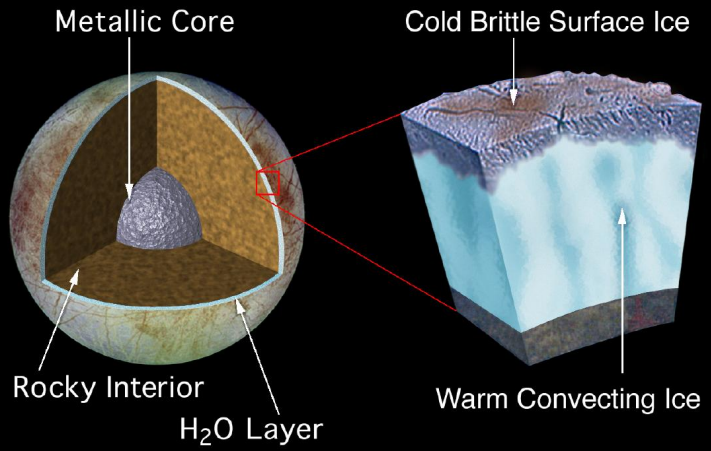
Jupiter’s moon **Europa**

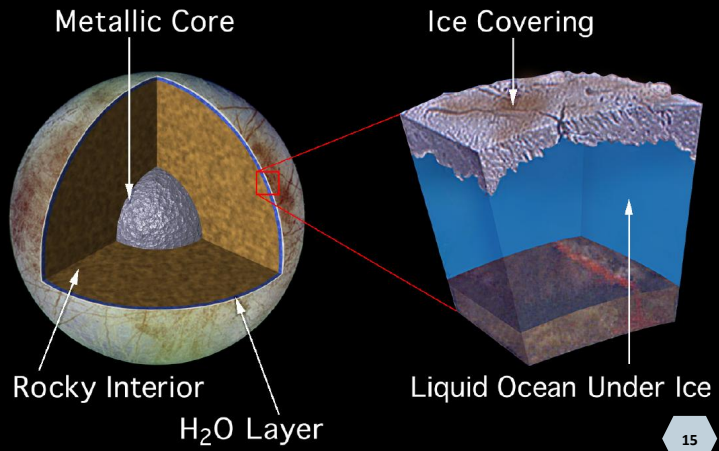
- Jupiter's magnetic field is disrupted in the space around Europa - implies a global ocean of salty water
- The surface is crisscrossed with bands and ridges with a lack of large impact craters – implies the surface is active - icy, volcanic flows, or settling of the icy crust
- Models of how tidal heating should affect Europa suggested that a global subsurface ocean might exist
- Hubble Space Telescope observed plumes of material in 2014. The plume’s origin corresponds to a warm region on Europa's surface.

https://europa.nasa.gov/

from water does all life begin…

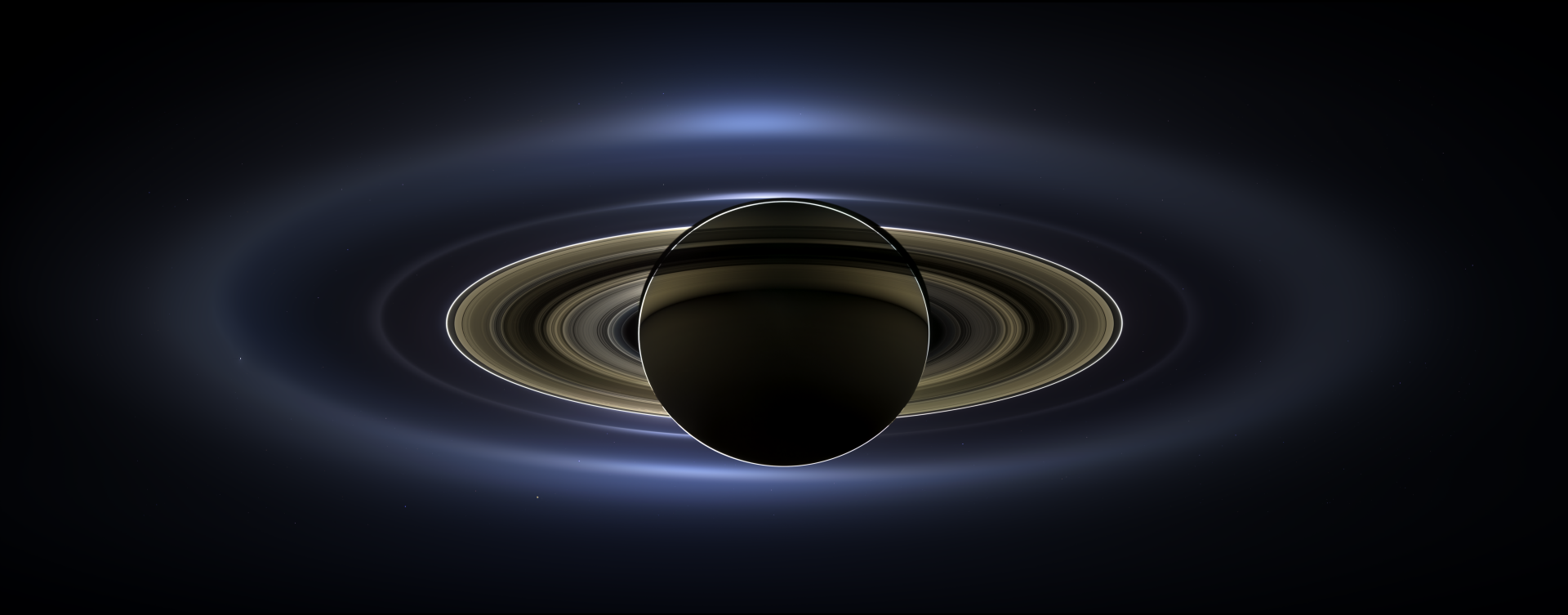
- If the ocean exists, the tides should deform the surface by about 30m; if the moon is frozen through, the tides should stretch the surface by only one meter
- What is the composition of the reddish material on the surface?
- Does this material hold clues to the composition of the ocean and whether material is cycling between the surface and the interior?
- The proposed Europa Lander mission concept would land on Europa's surface to perform an in situ study of composition and habitability; Clipper will scout landing sites



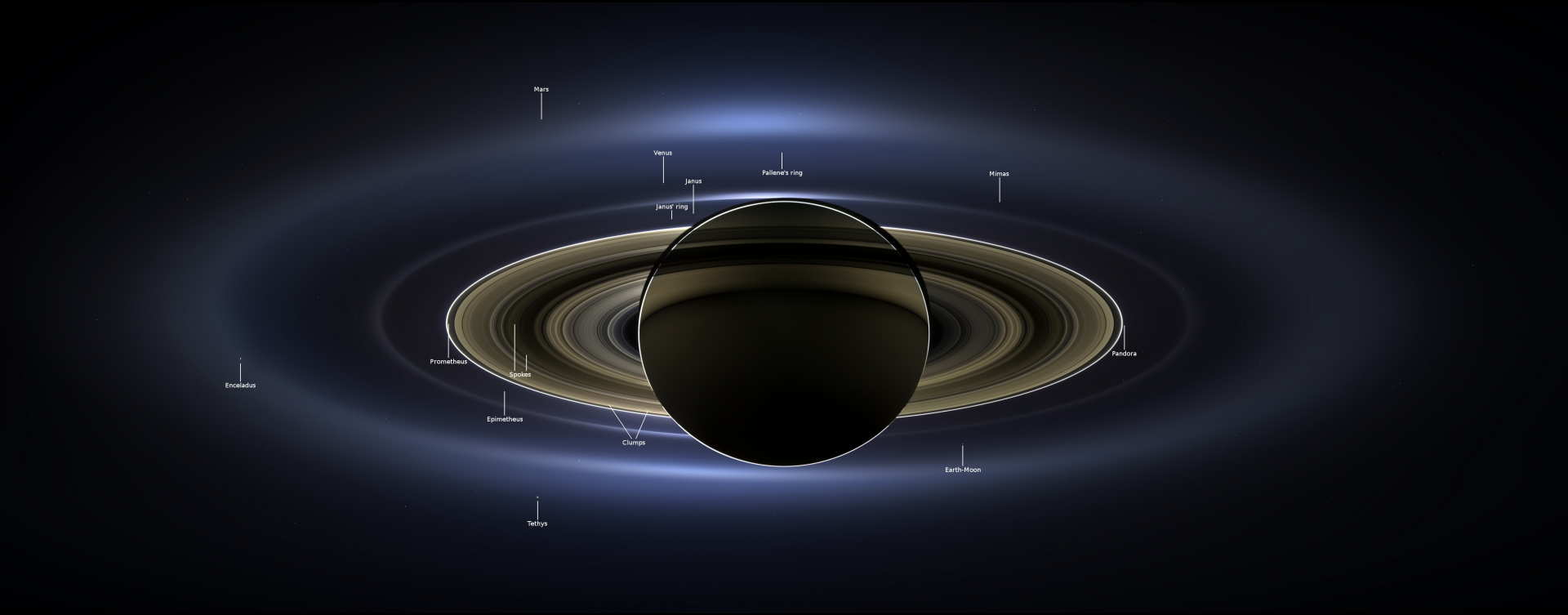


https://europa.nasa.gov/

Saturn ♄

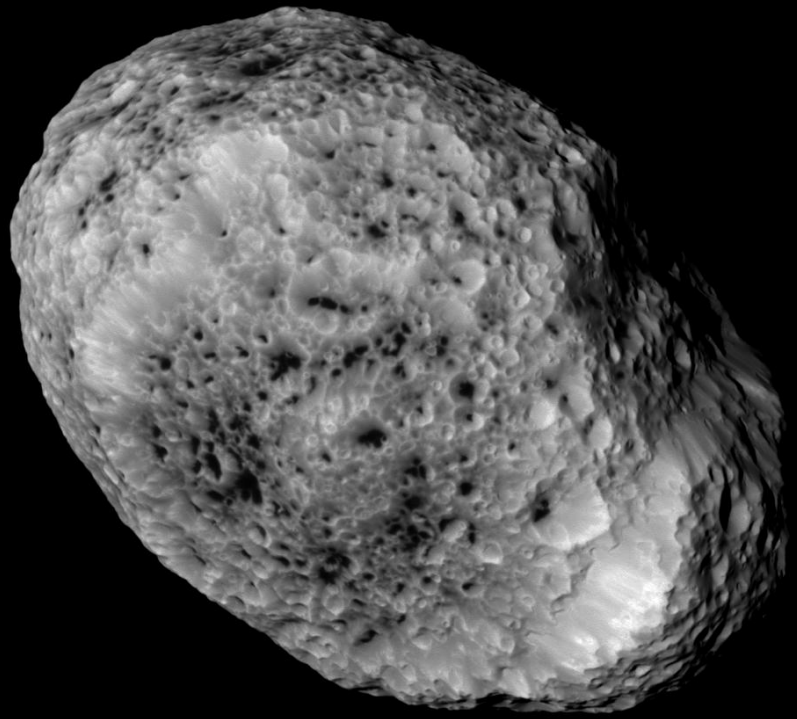


Saturn ♄

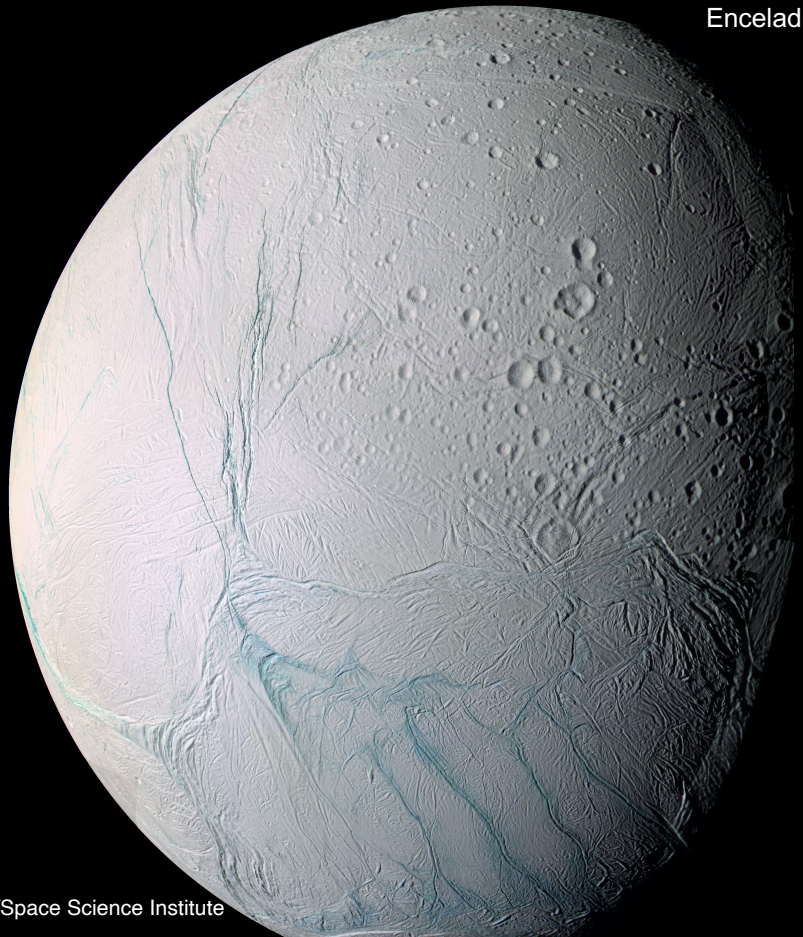

Mars
Venus
Janus
Janus' ring
Pallene's ring
Mimas
Prometheus
Spokes
Enceladus
Epimetheus
Clumps
Pandora
Earth-Moon
Tethys

Saturn’s moons

Hyperion

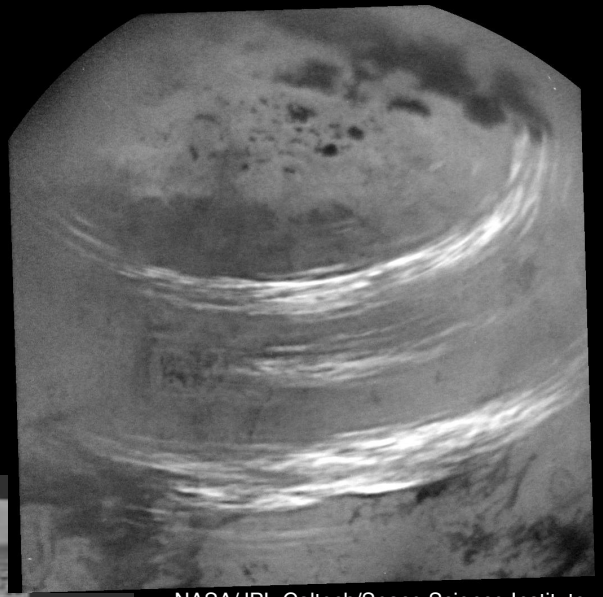


Enceladus

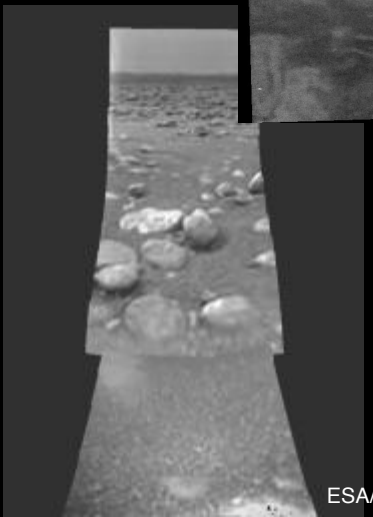


NASA/JPL/Space Science Institute

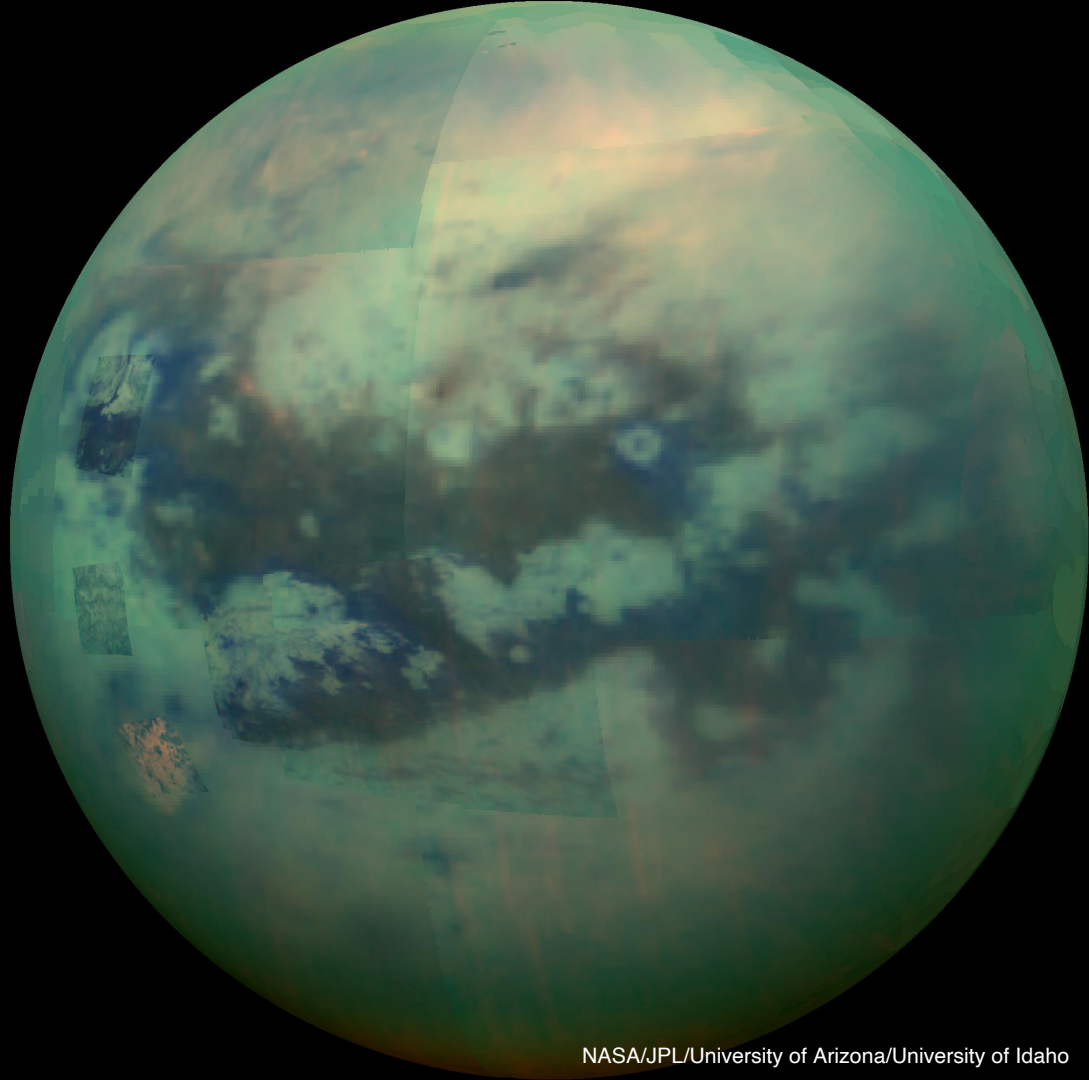
Titan



NASA/JPL-Caltech/Space Science Institute

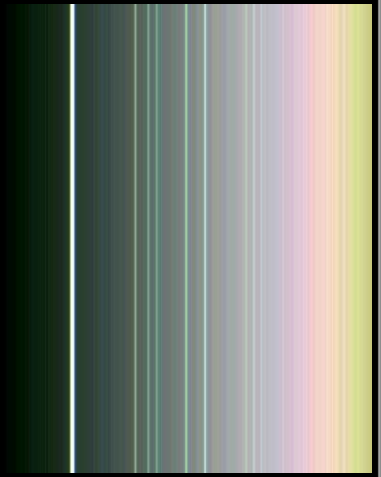


ESA/NASA/JPL/University of Arizona

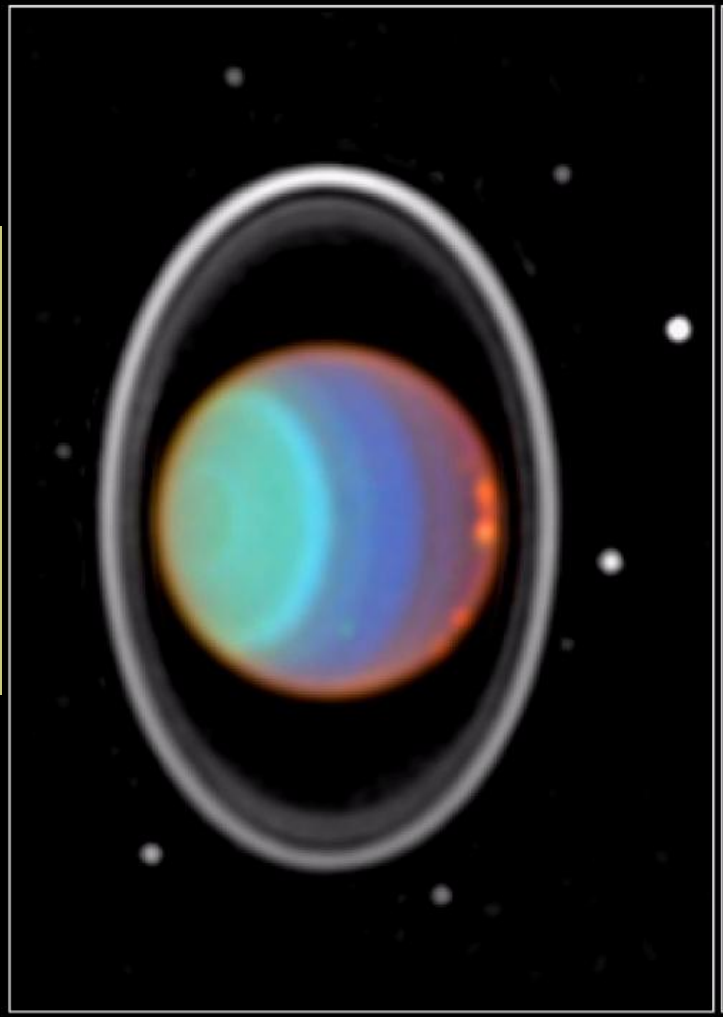


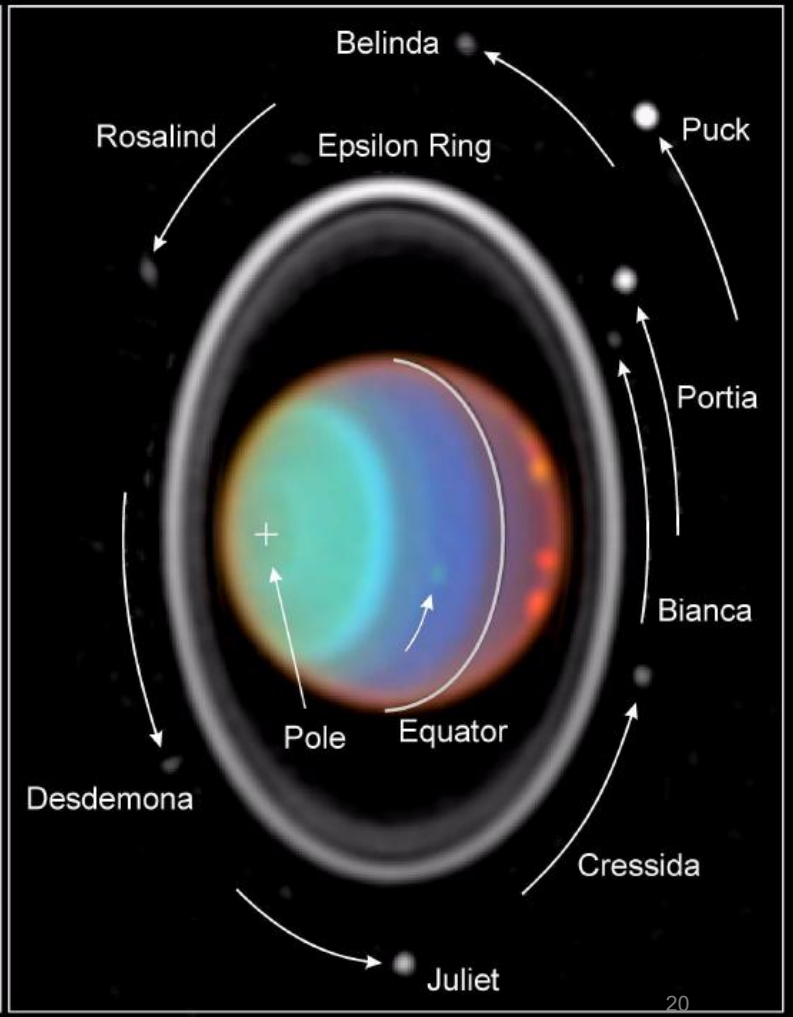
NASA/JPL/University of Arizona/University of Idaho

Uranus ♅



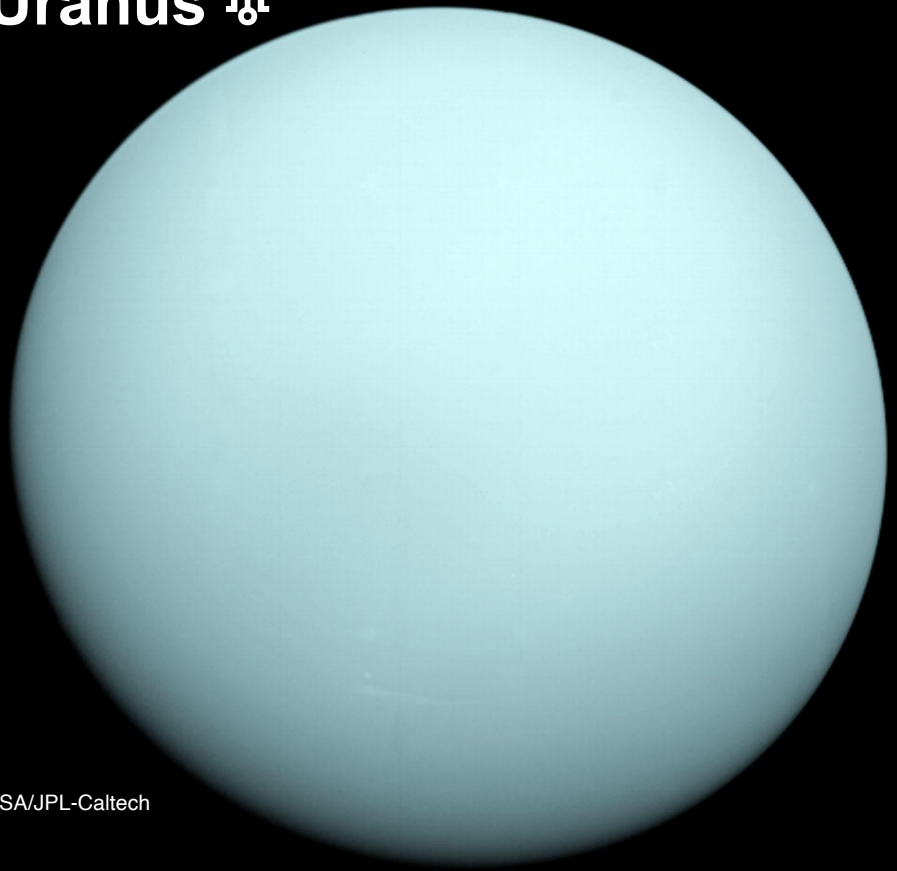
NASA/JPL





NASA/JPL/STScI

Uranus ♅



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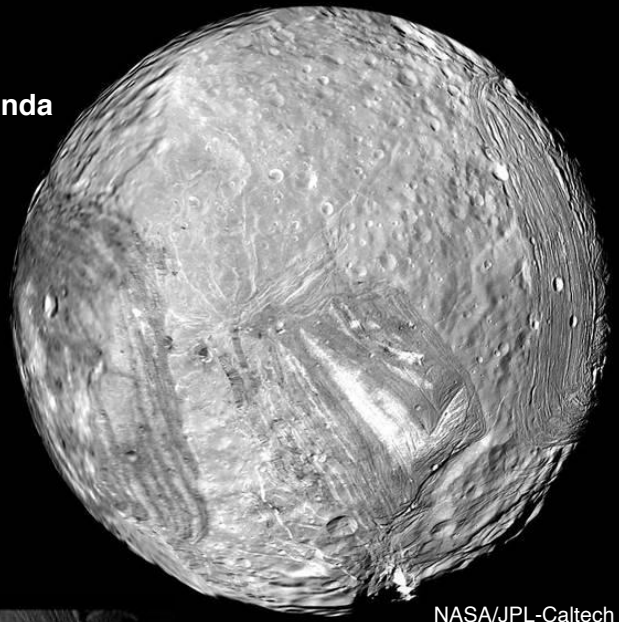
Miranda



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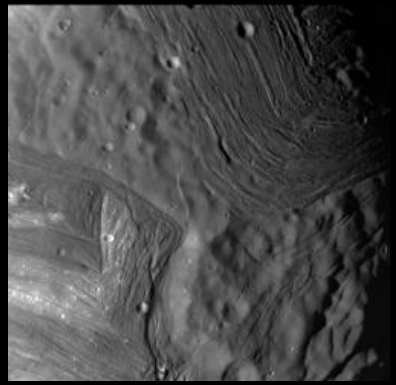

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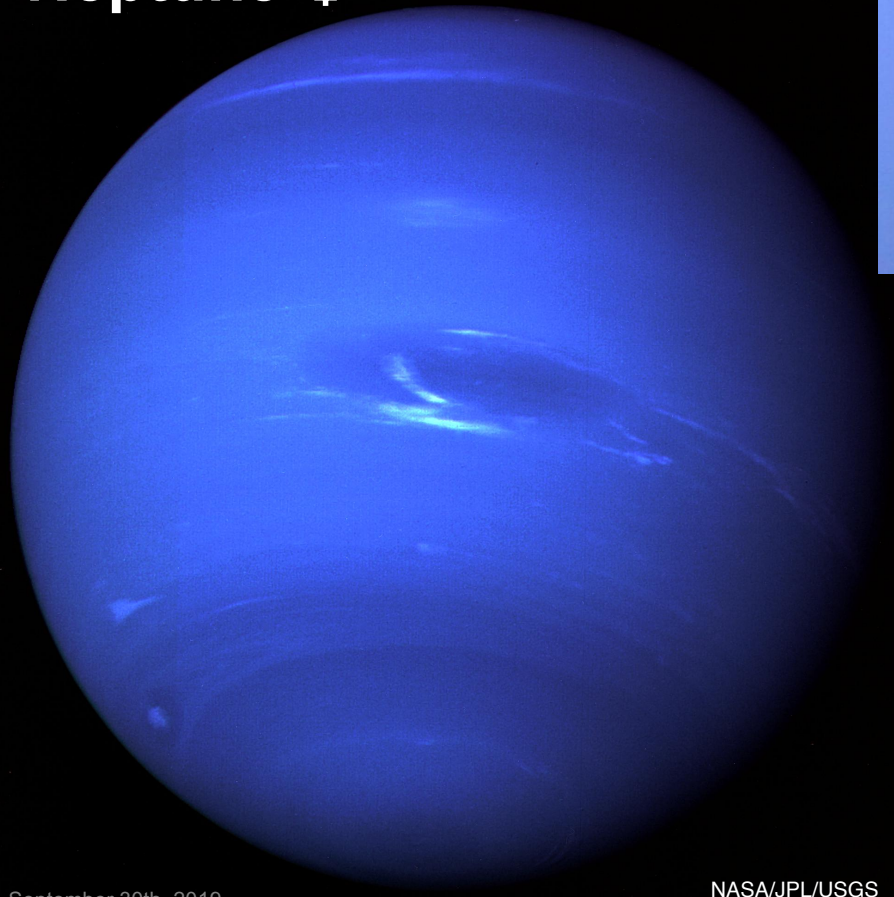
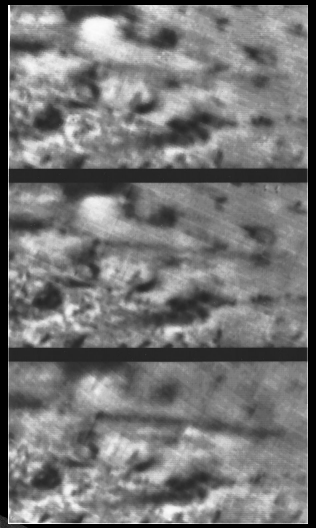
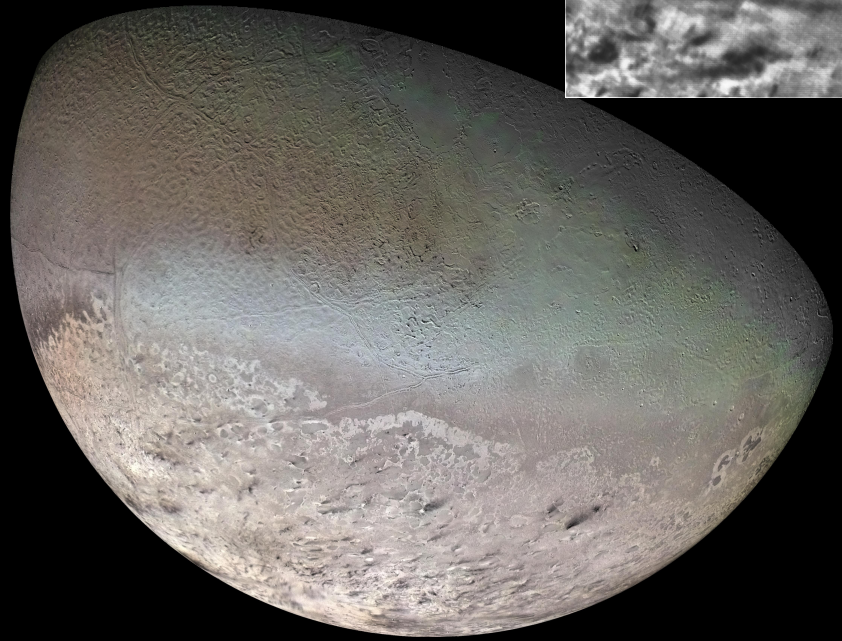
Neptune ♆





Triton



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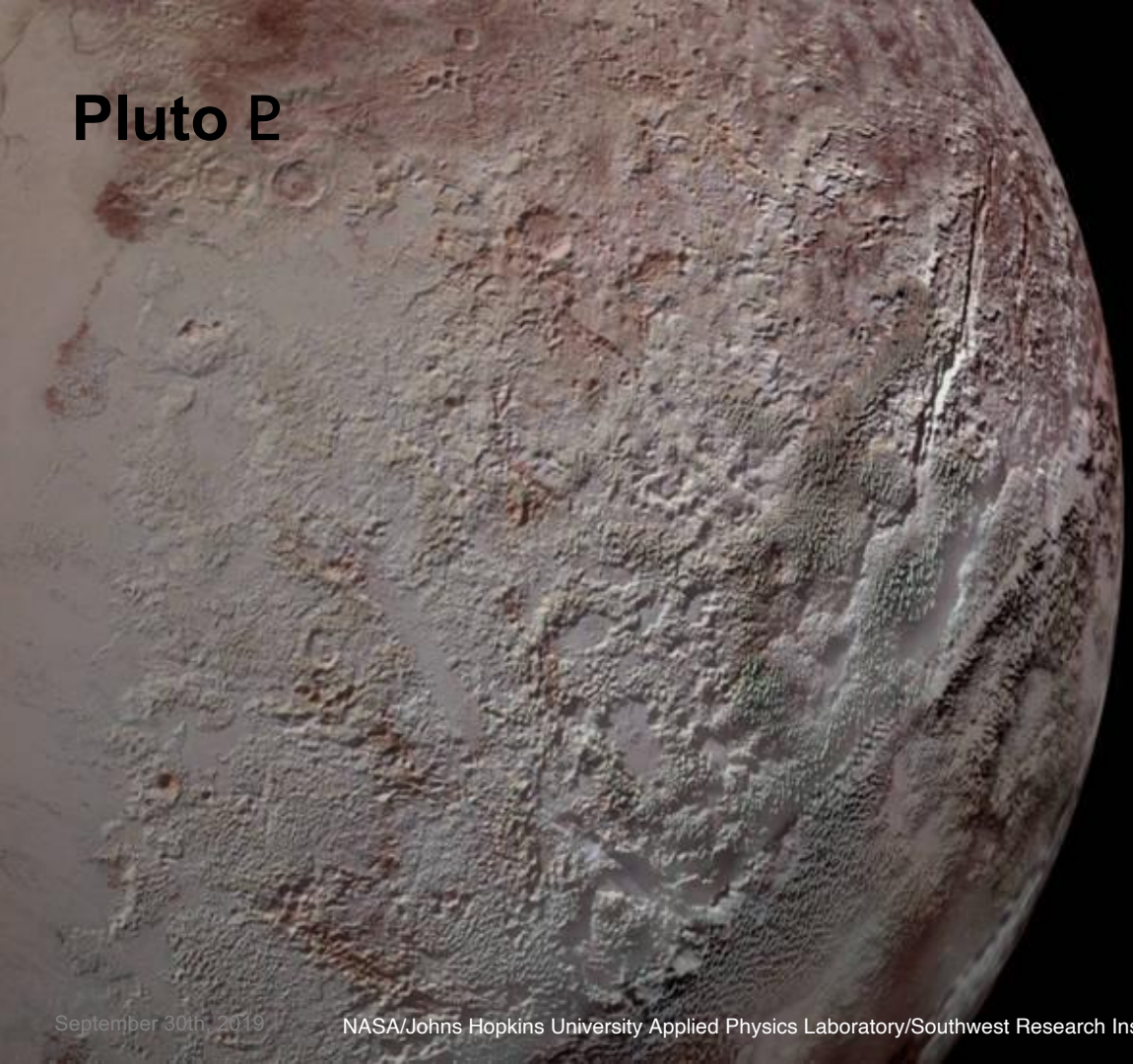
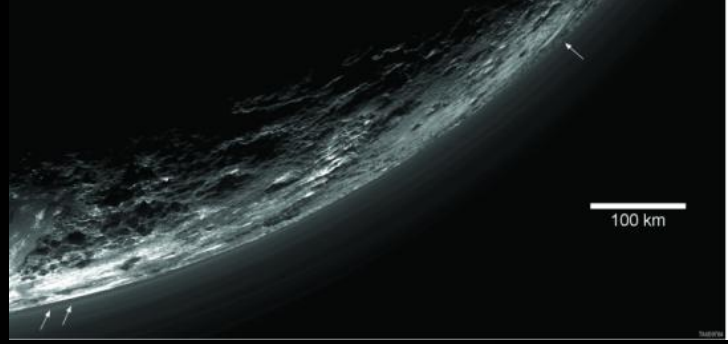
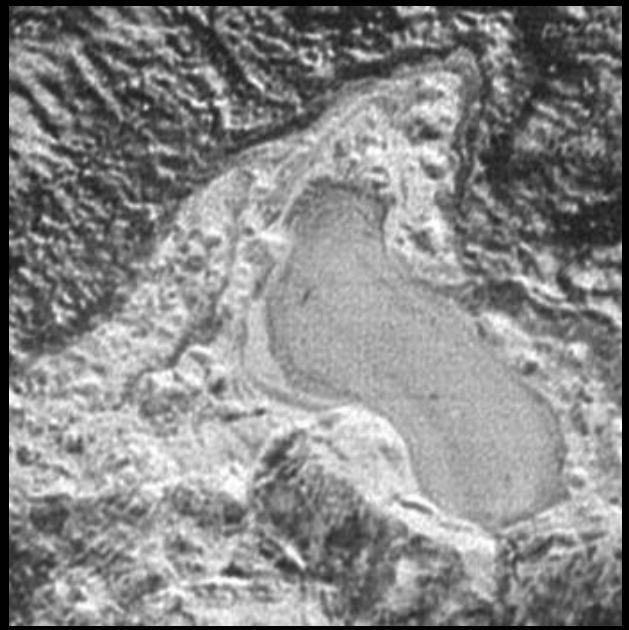
Pluto P







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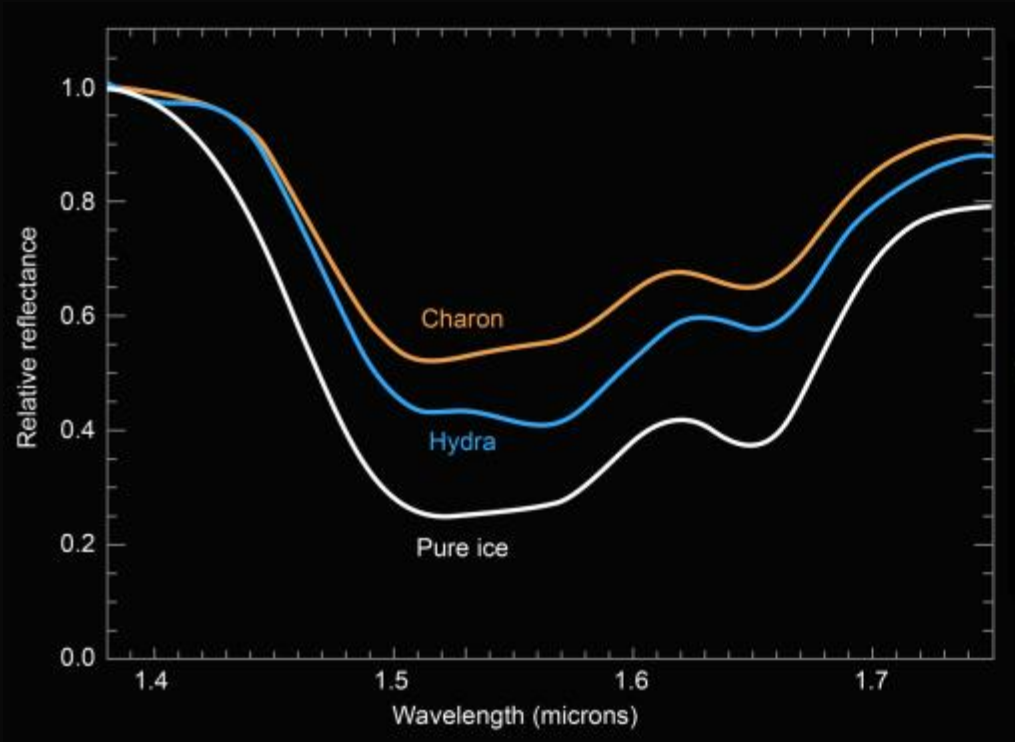
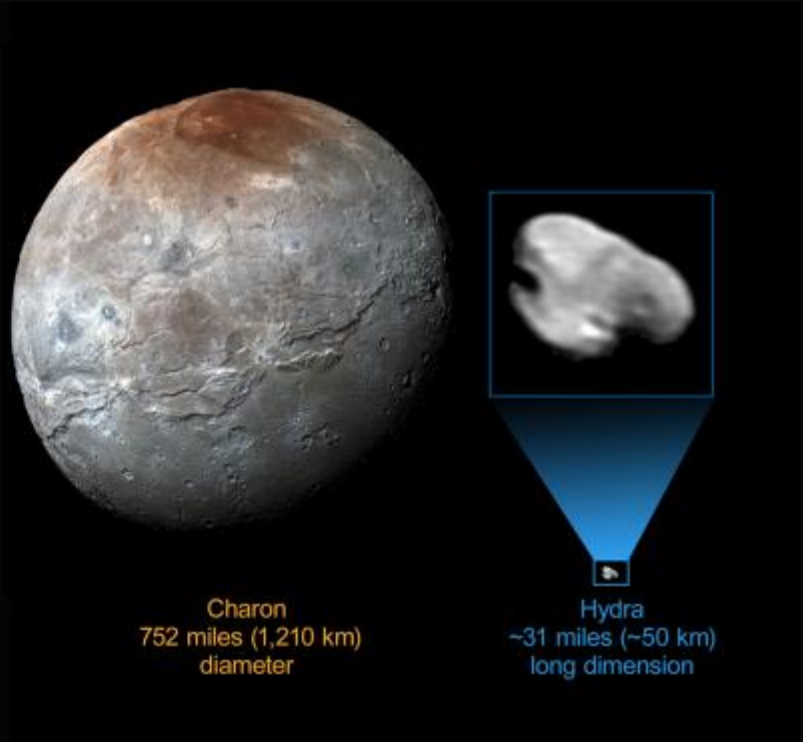
Pluto ♇





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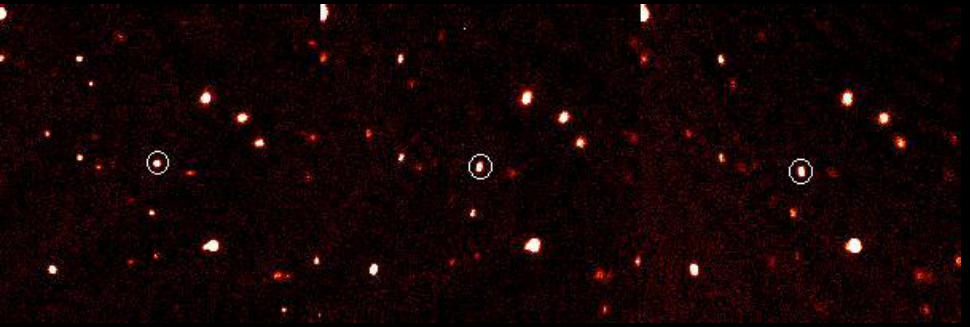
Eris



NASA/JPL-Caltech

Arrokoth

(2014 MU69)

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