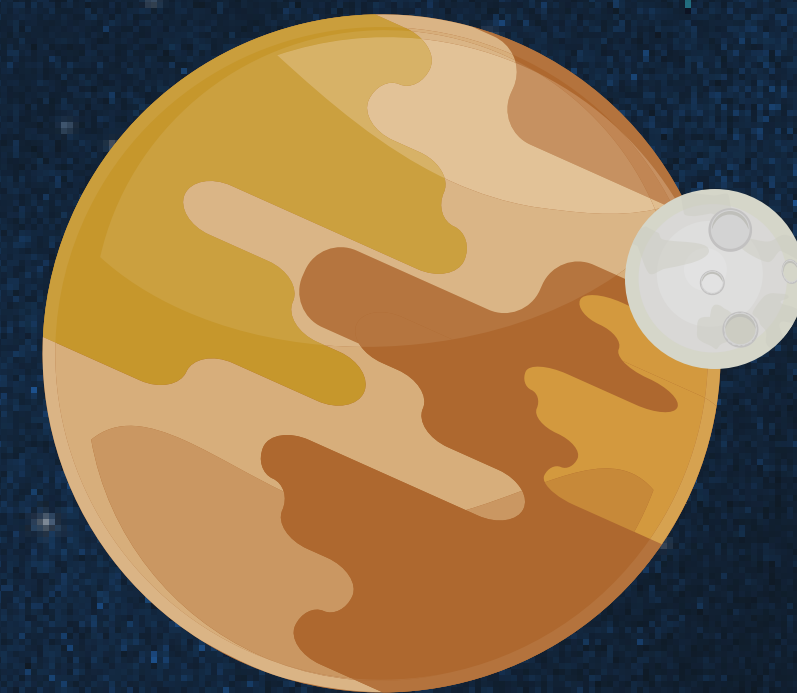




# 3 Moons to Know About

By Telvin Benjamin



As of 2021, our solar system has a total of 200+ moons from 6 of the 8 planets (Earth, Mars, Jupiter, Saturn, Uranus, and Neptune) and 4 of the 6 confirmed dwarf planets (Pluto, Haumea, Makemake, and Eris). For this first edition of moons to know about, we will focus on one from Jupiter, Europa (1 of at least 79 moons), and two from Saturn, Enceladus and Titan (2 of at least 82 moons). All these three moons have the possibility of liquid water oceans underneath their surfaces. These are a few of the possible destinations where humans may visit in the outer solar system.

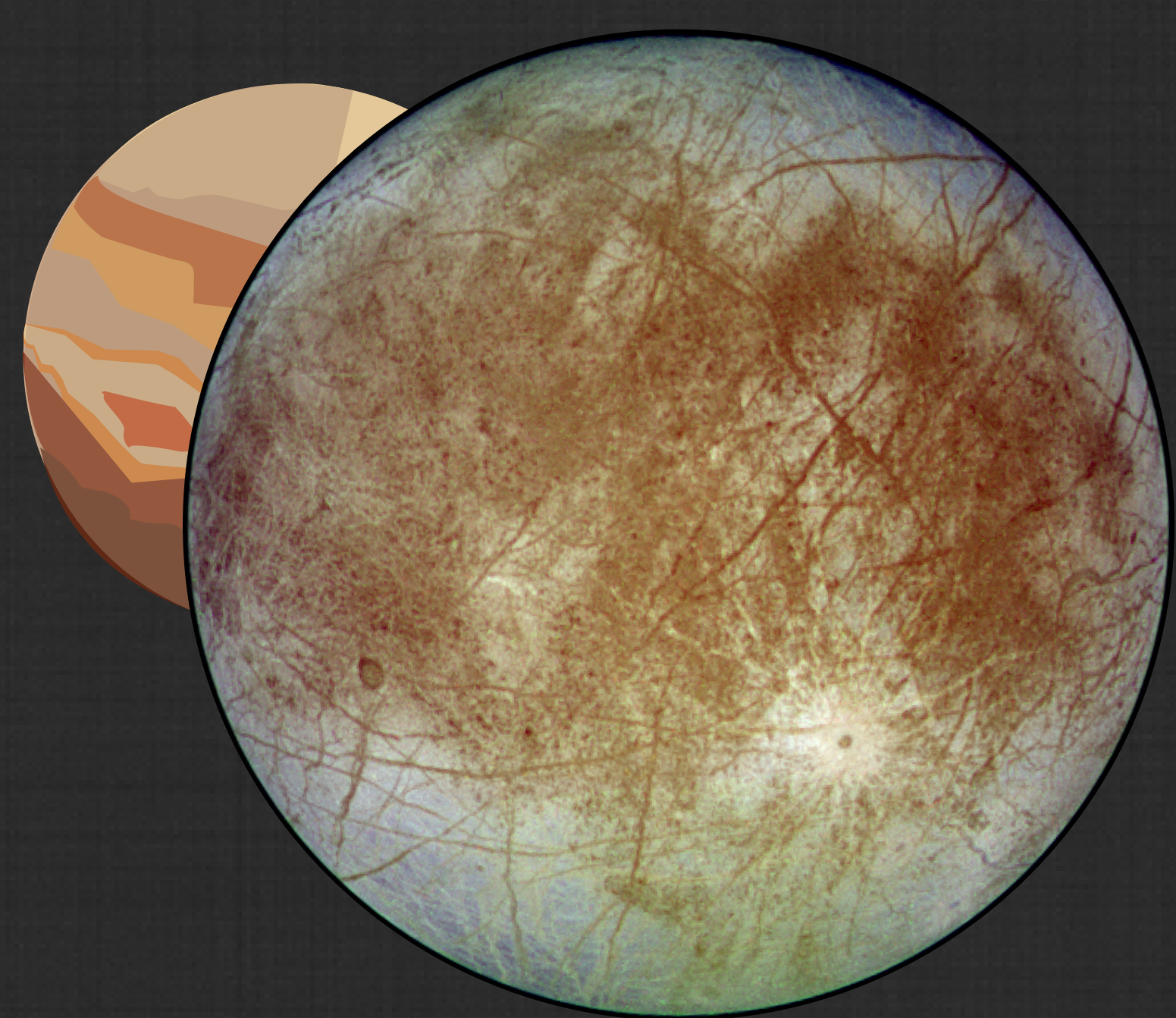
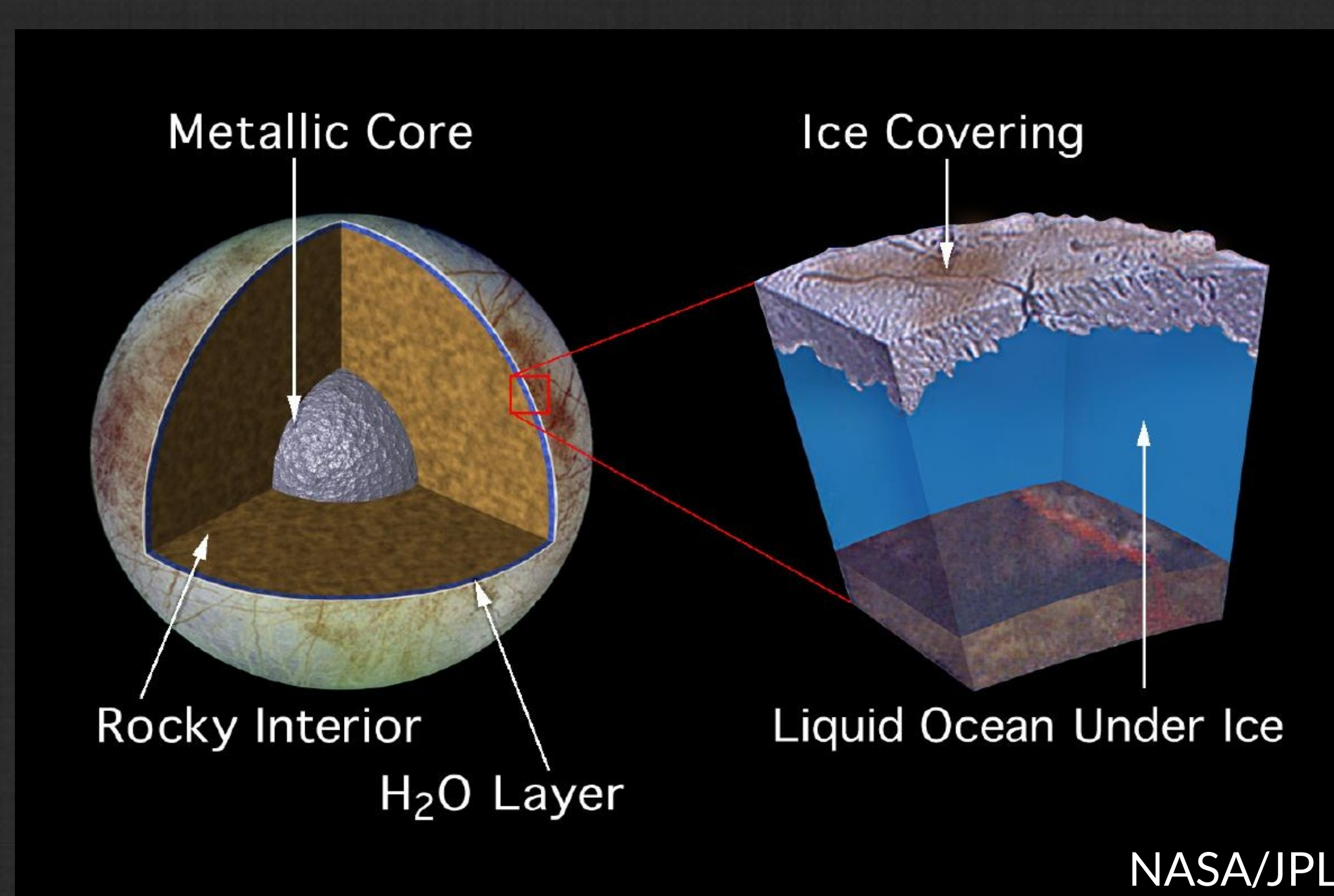


Image taken on Sept. 7, 1996 by the Galileo spacecraft showing a fractured crust.

## Europa

- > Discovery: Jan. 8, 1610 by Galileo Galilei
- > One of the Galilean moons alongside with Ganymede, Io, and Callisto.
- > Estimated age is about 4.5 billion years (similar to Jupiter).
- > Distance from Jupiter: about 670,900 km (414,000 mi.) Takes 3 and a half Earth days to orbit around.

- > Diameter: 3,100 km (1,900 mi.) Smaller than Earth's moon, but larger than Pluto.
- > Lowest Temperature (at poles): -220 C (-370 F)
- > Highest Temperature (at equator): -160 C (-260 F)
- > Has a very thin oxygen atmosphere.
- > Surface is covered by a frozen saltwater ocean. Beneath surface may be an active liquid water ocean.
- > Extraterrestrial microbial life may lark in its seas...!



## Enceladus

- > Discovery: Aug. 28, 1789 by William Herschel
- > Terrain ranges from old to young with the young ones forming as recently as 100 millions years ago.
- > Distance from Saturn: average of 238,037 km (147,909 mi.) Takes 1.37 Earth days to orbit around.
- > Diameter: 505 km (314 mi.), can fit within Arizona

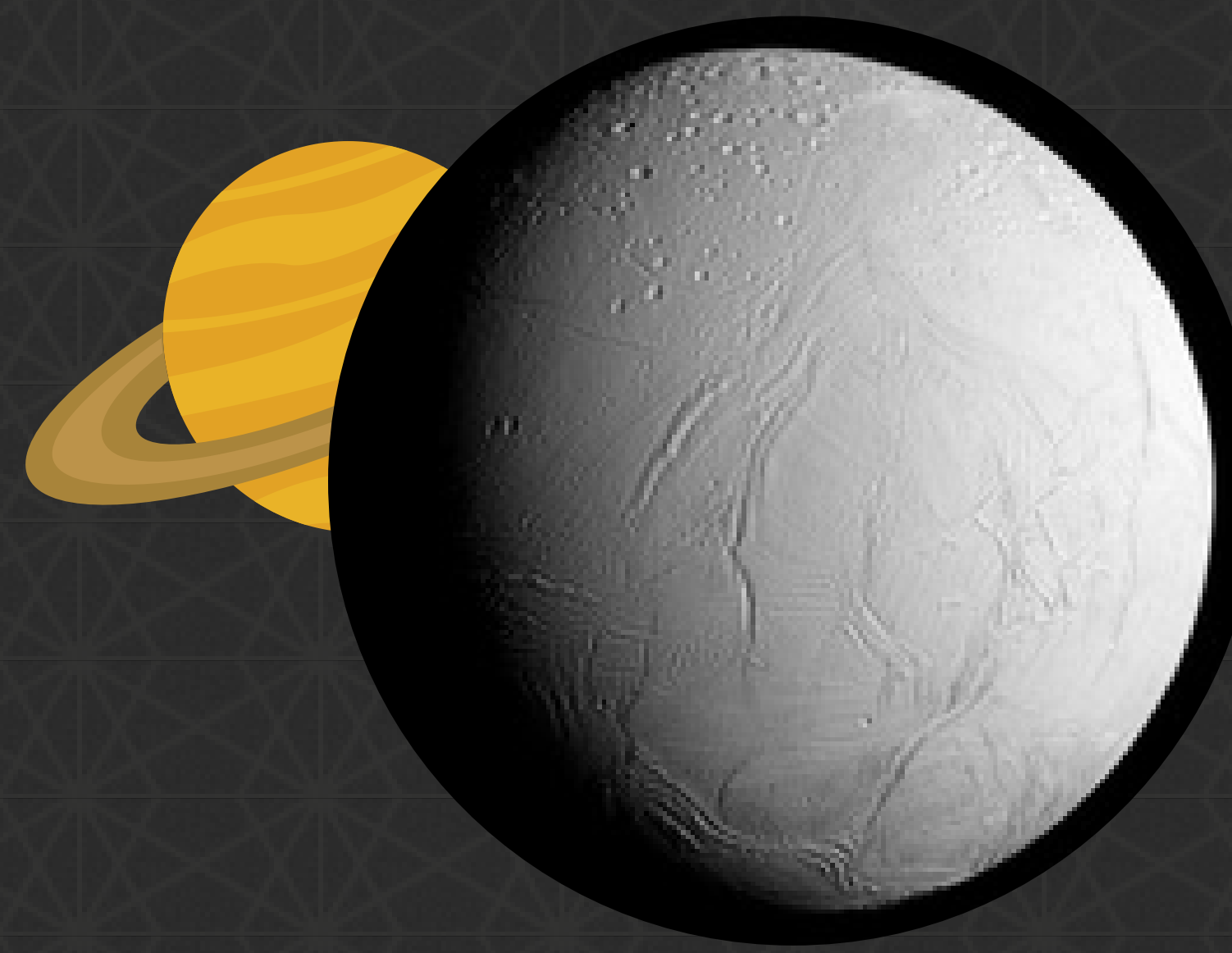
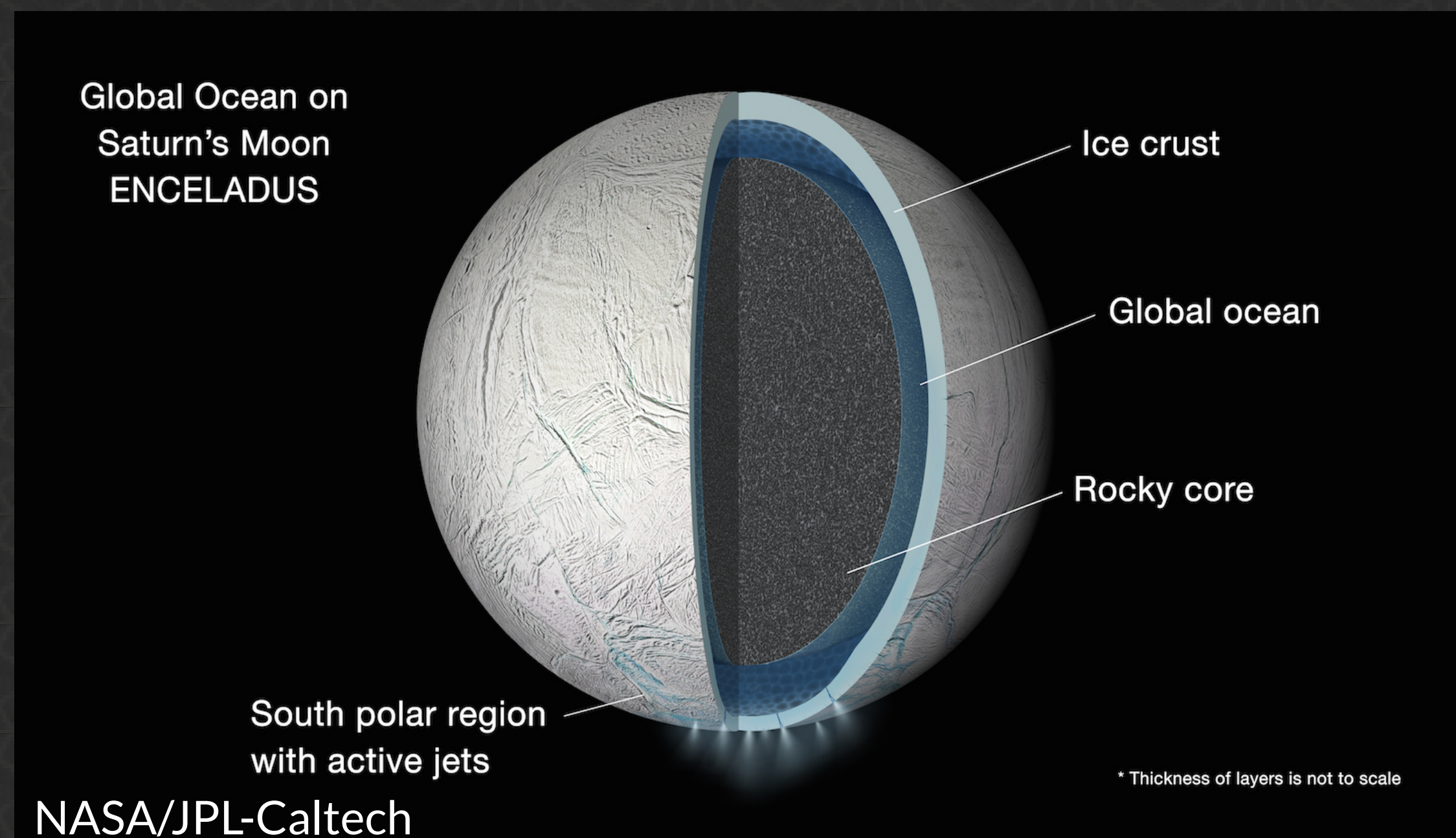


Image taken on Oct. 28, 2015 by the Cassini spacecraft showing a wrinkled surface.



- > Temperature: as low as -201 C (-330 F)
- > Icy surface reflects almost 100% of sunlight.
- > In 2015, scientists confirmed the presence of a subsurface global liquid water ocean.
- > 101 geysers have been identified around south pole which vents water vapor and other icy material.
- > Seas may have the capabilities of supporting extraterrestrial microbial life.

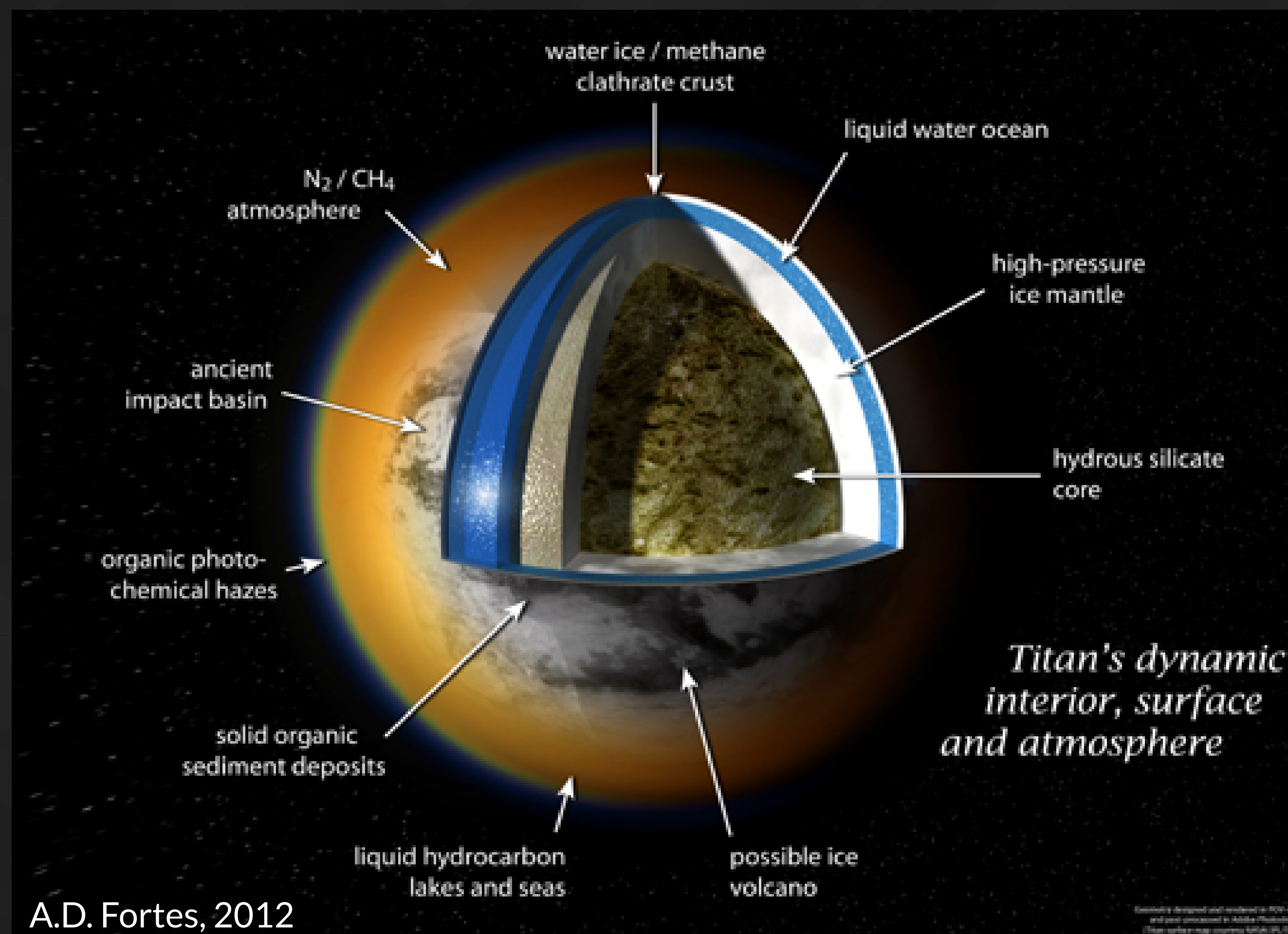


## Titan

- > Discovery: March 25, 1655 by Christiaan Huygens
- > Second largest moon in the solar system (after Ganymede of Jupiter); larger than Mercury!
- > Diameter: 5,150 km (3,200 mi.)
- > Only moon to have a planet-like thick atmosphere.
- > Stratosphere: nitrogen (98.4%), methane (1.4%), hydrogen (0.2%)
- > Troposphere: nitrogen (95%), methane (4.9%)

Image taken on Jan. 30, 2012 by the Cassini spacecraft showing a hazy, orange ball.

- > Distance from Saturn: 759,235 km (1.22 million mi.)
- > Orbital period: 15.945 Earth days
- > Temperature average: -179 C (-290 F)
- > Liquid methane, ethane lakes and seas are present throughout the surface.
- > Kraken Mare is the largest of those detected (larger than Caspian Sea on Earth).
- > Subsurface liquid water ocean may exist.
- > As with the other moons, extraterrestrial life may also be larking in its seas...



## Sources

- Europa: <http://www.space.com/15498-europa-sdcmp.html>
- Enceladus: <http://www.space.com/20543-enceladus-saturn-s-tiny-shiny-moon.html>
- Titan: <http://www.space.com/15257-titan-saturn-largest-moon-facts-discovery-sdcmp.html>

