



Planning for the Exploration of Mars and Ocean Worlds

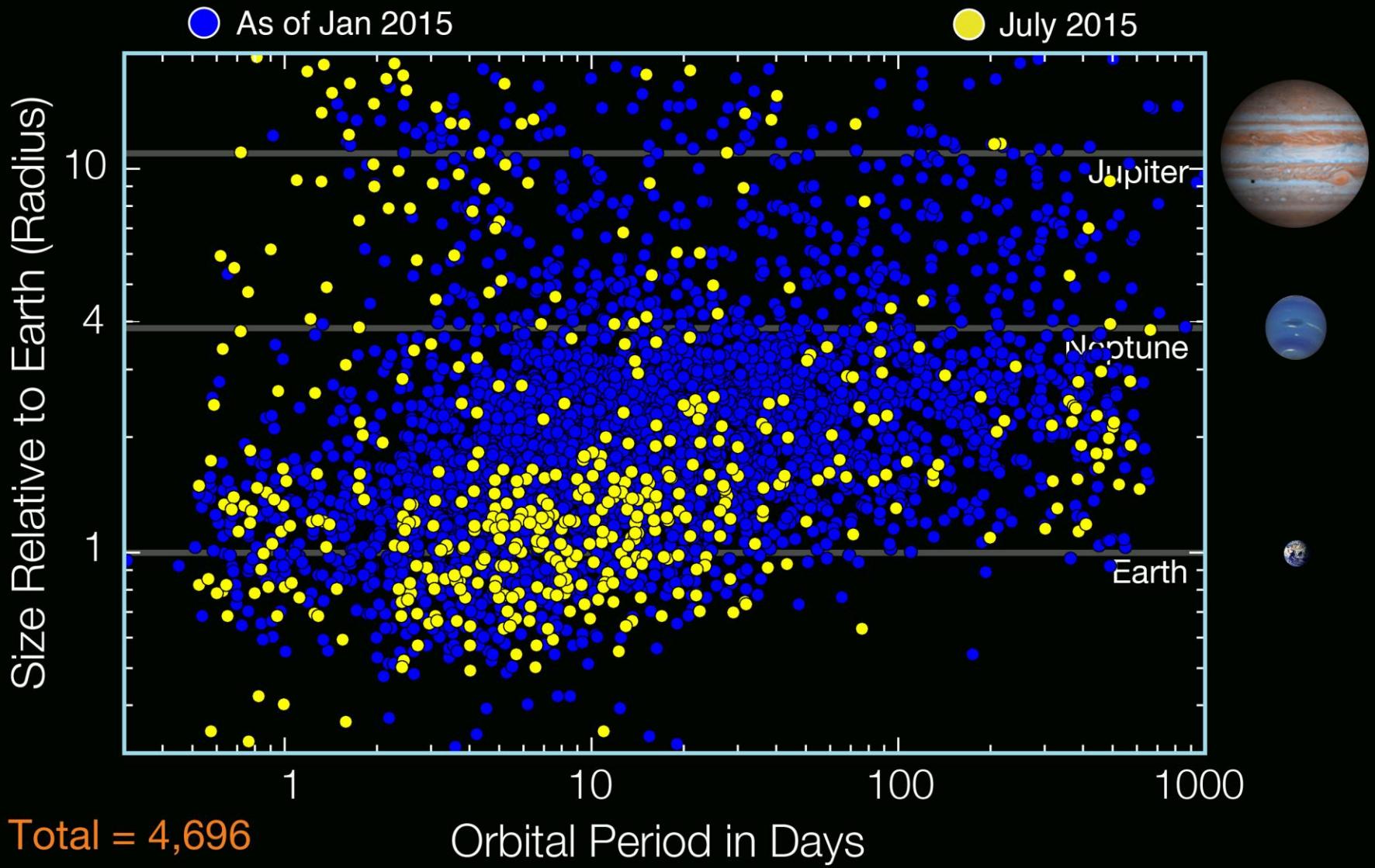
Dr. Ellen R. Stofan
Chief Scientist
NASA



NASA SCIENCE

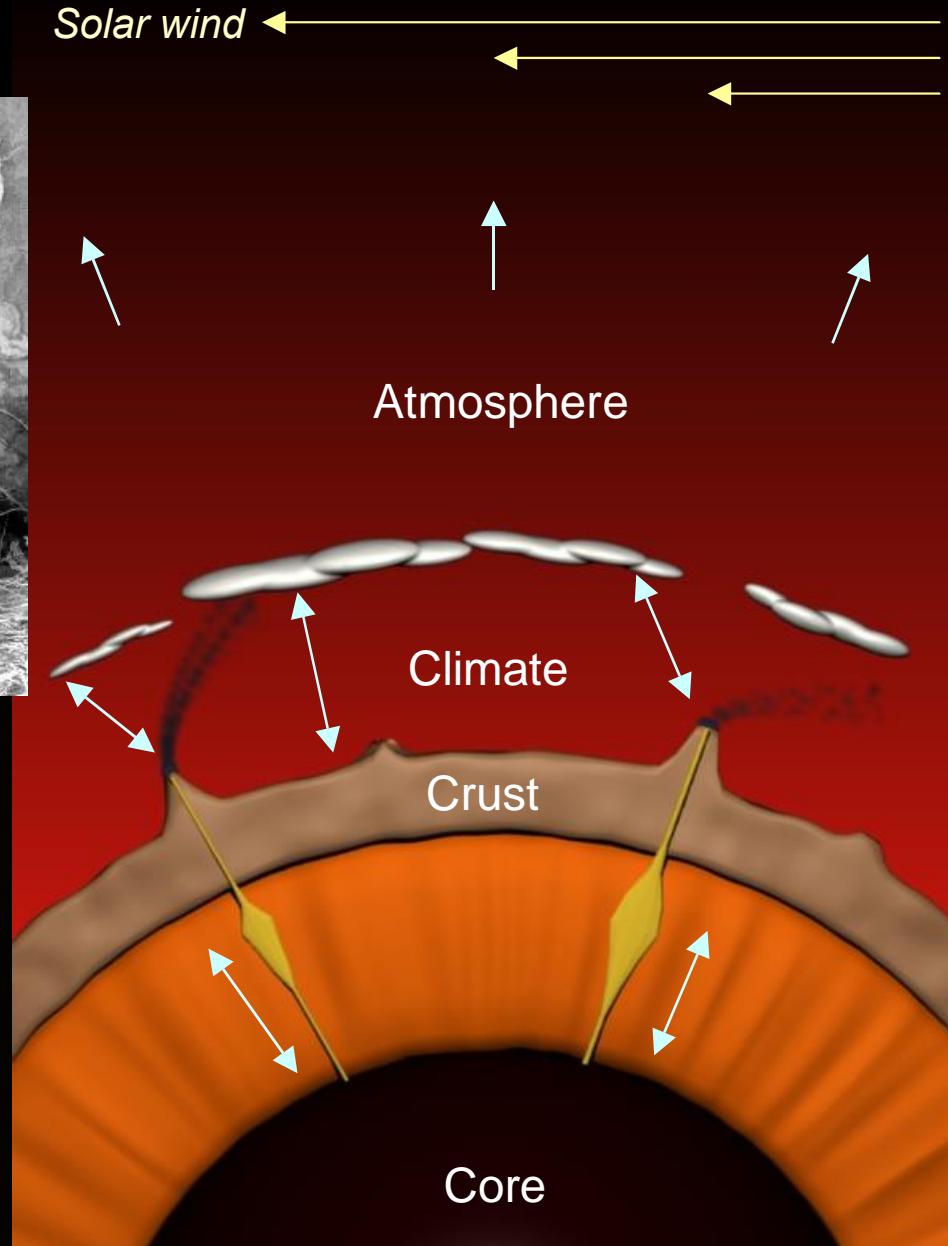
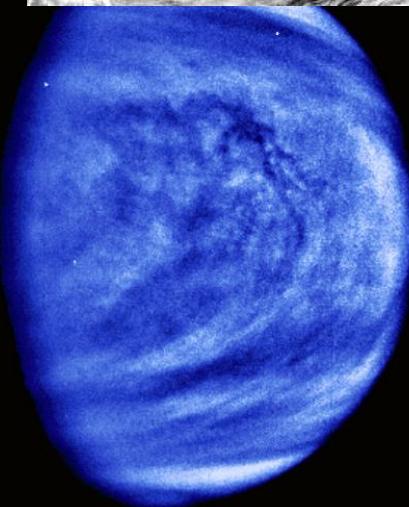
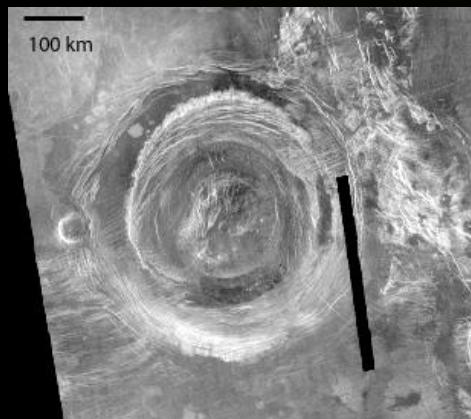
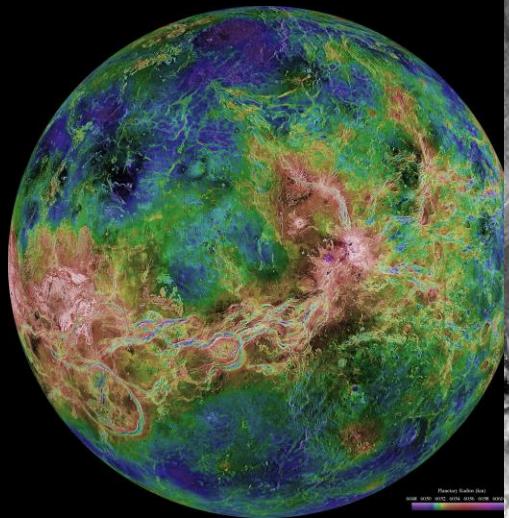
New Kepler Planet Candidates

As of July 23, 2015





Venus





JOURNEY TO MARS



All elements needed for a human Mars mission are in development now.



EARTH RELIANT NOW - MID-2020s

International Space Station operation through
commercial development of low-Earth orbit
Development of deep space systems
life support and human health

PROVING GROUND 2018-2030

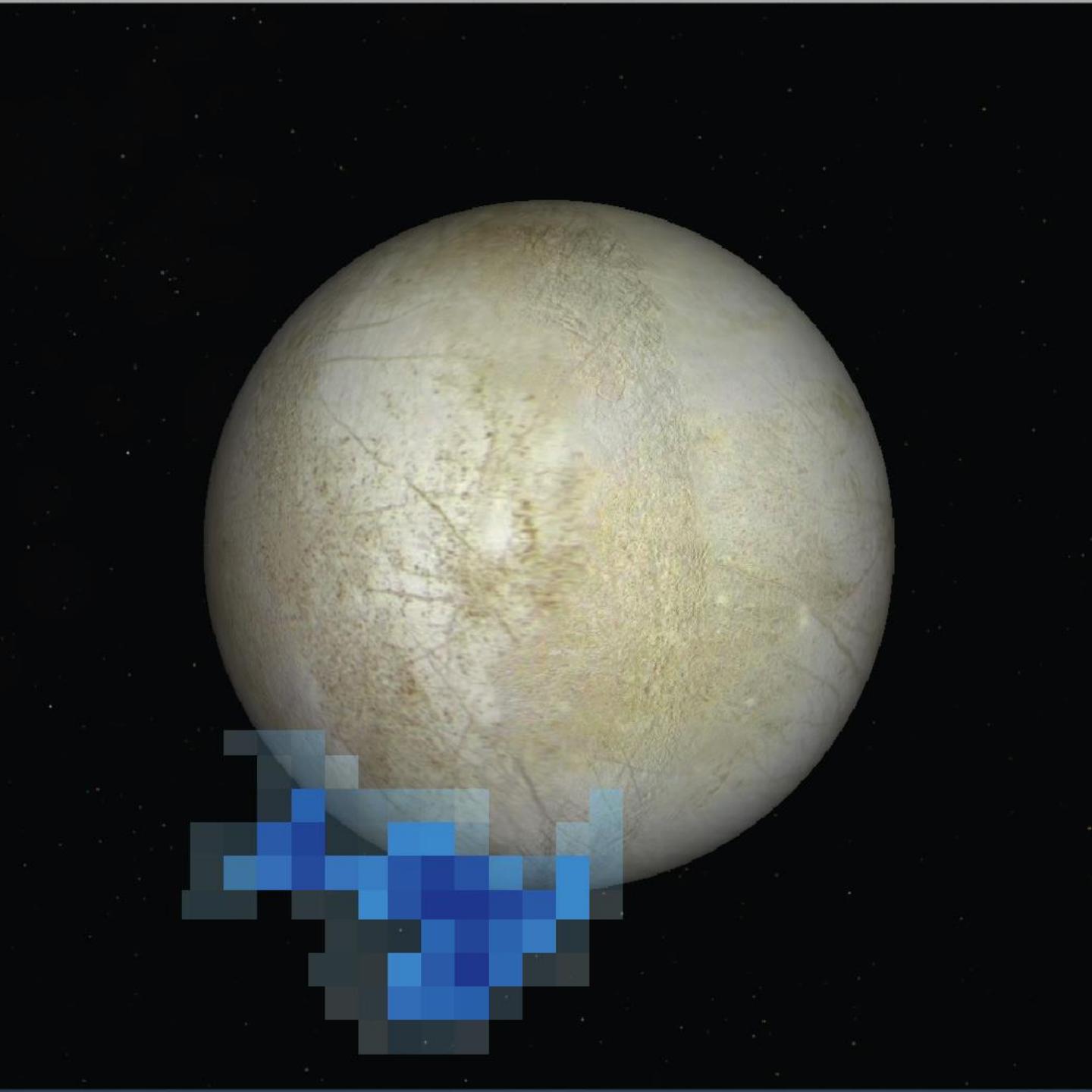
Regular crewed missions and spacewalks in cislunar space
Verify deep space habitation and conduct
a yearlong mission to validate readiness for Mars
Demonstrate integrated human and robotic operations
by redirecting and sampling an asteroid boulder

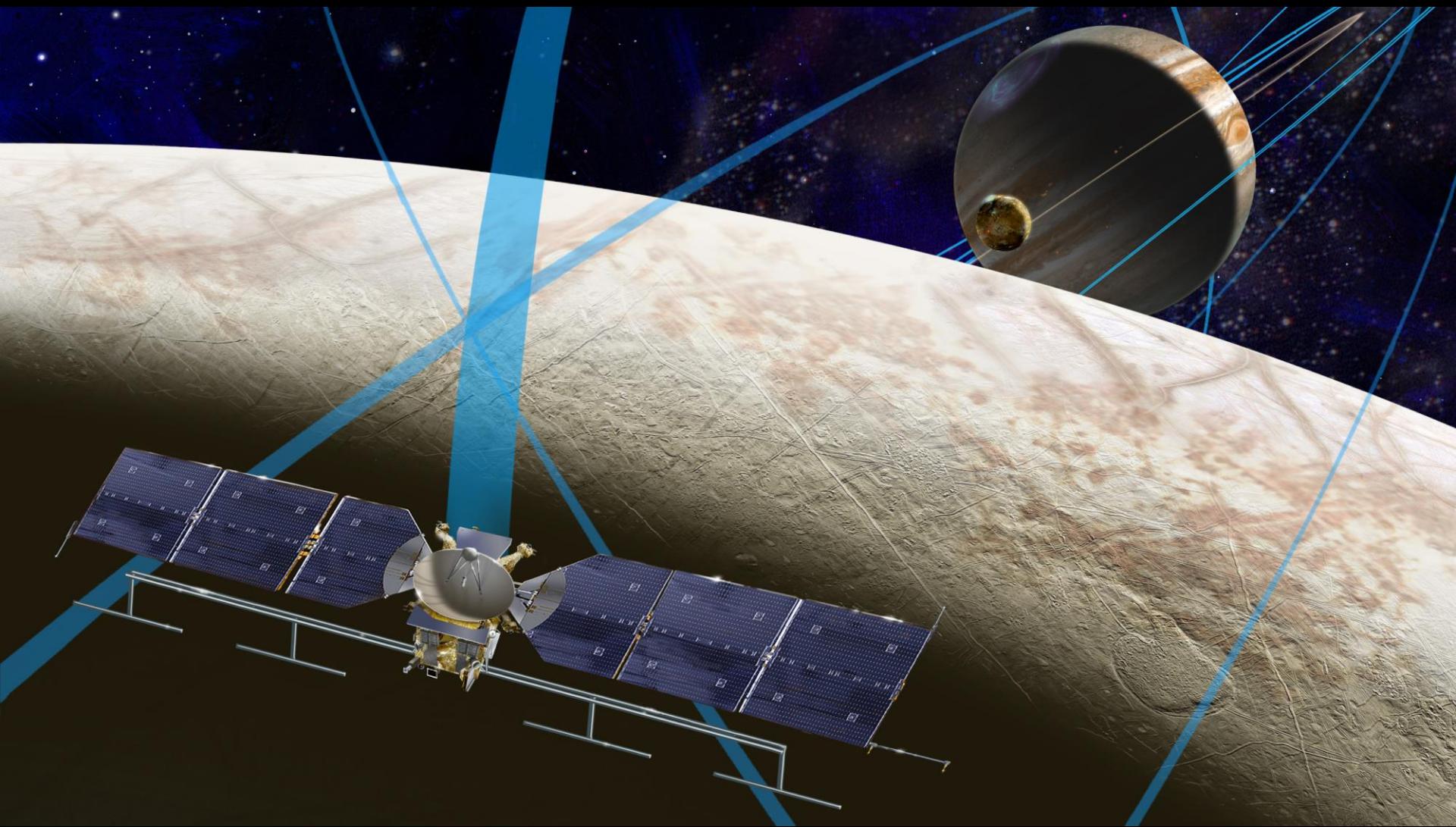
EARTH INDEPENDENT NOW – 2030s and beyond

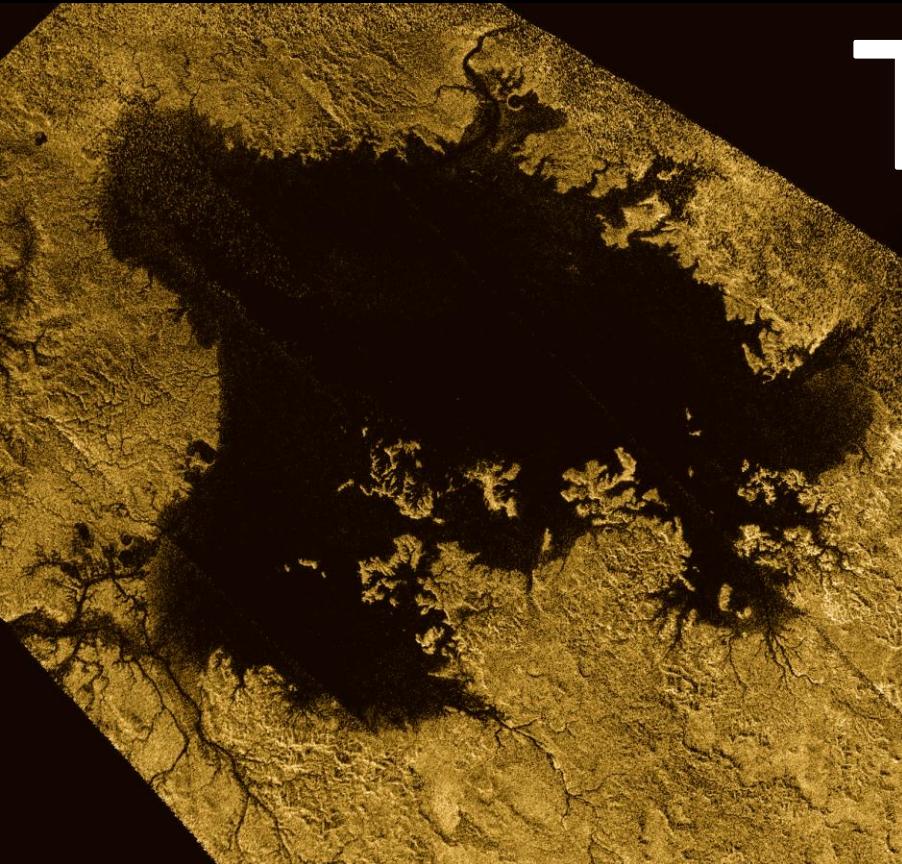
Science missions pave the way to Mars
Demonstrate entry, descent, and
landing and in-situ resource use
Conduct robotic roundtrip demonstration
with sample return in the late 2020s
Send humans to orbit Mars in the early 2030s



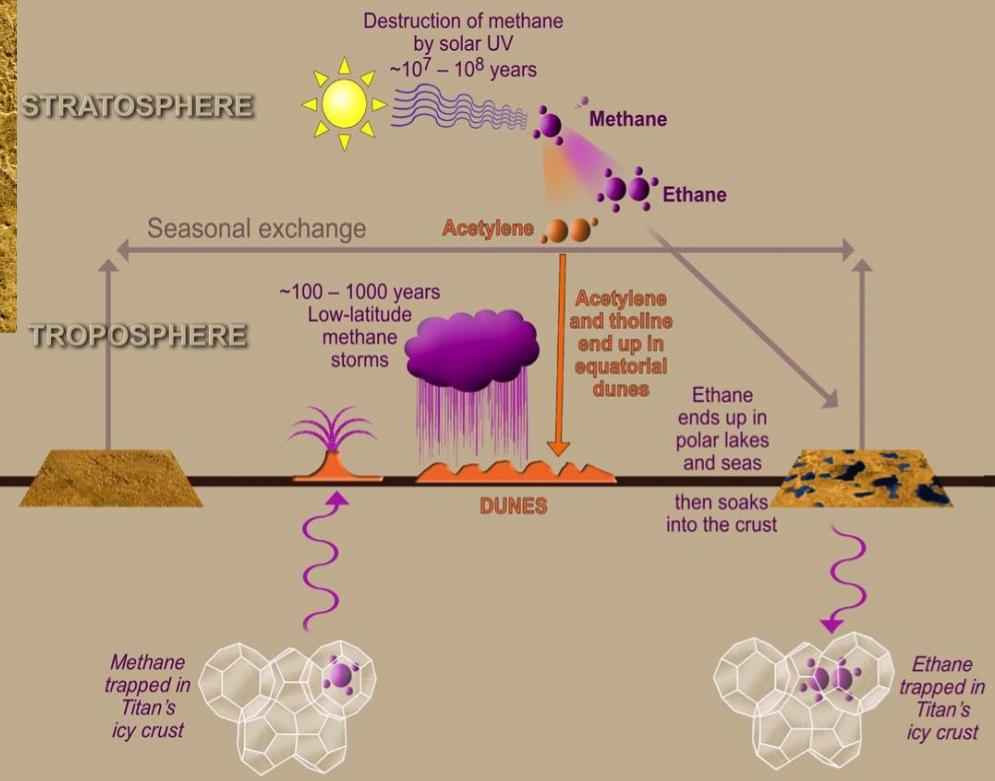
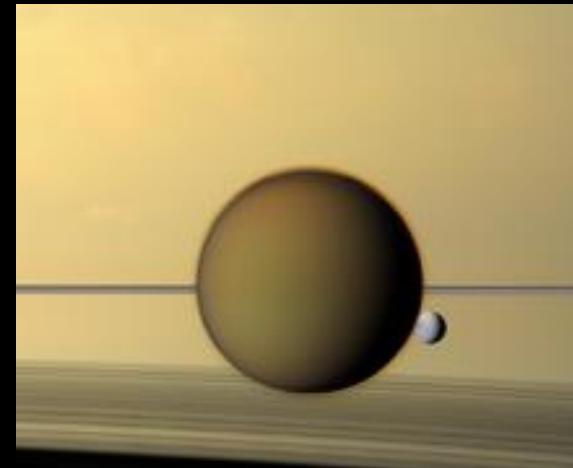
Shown to scale







Titan



After Lunine and Atreya,