

Rockin' the Solar System: DLR's Institute of Planetary Research

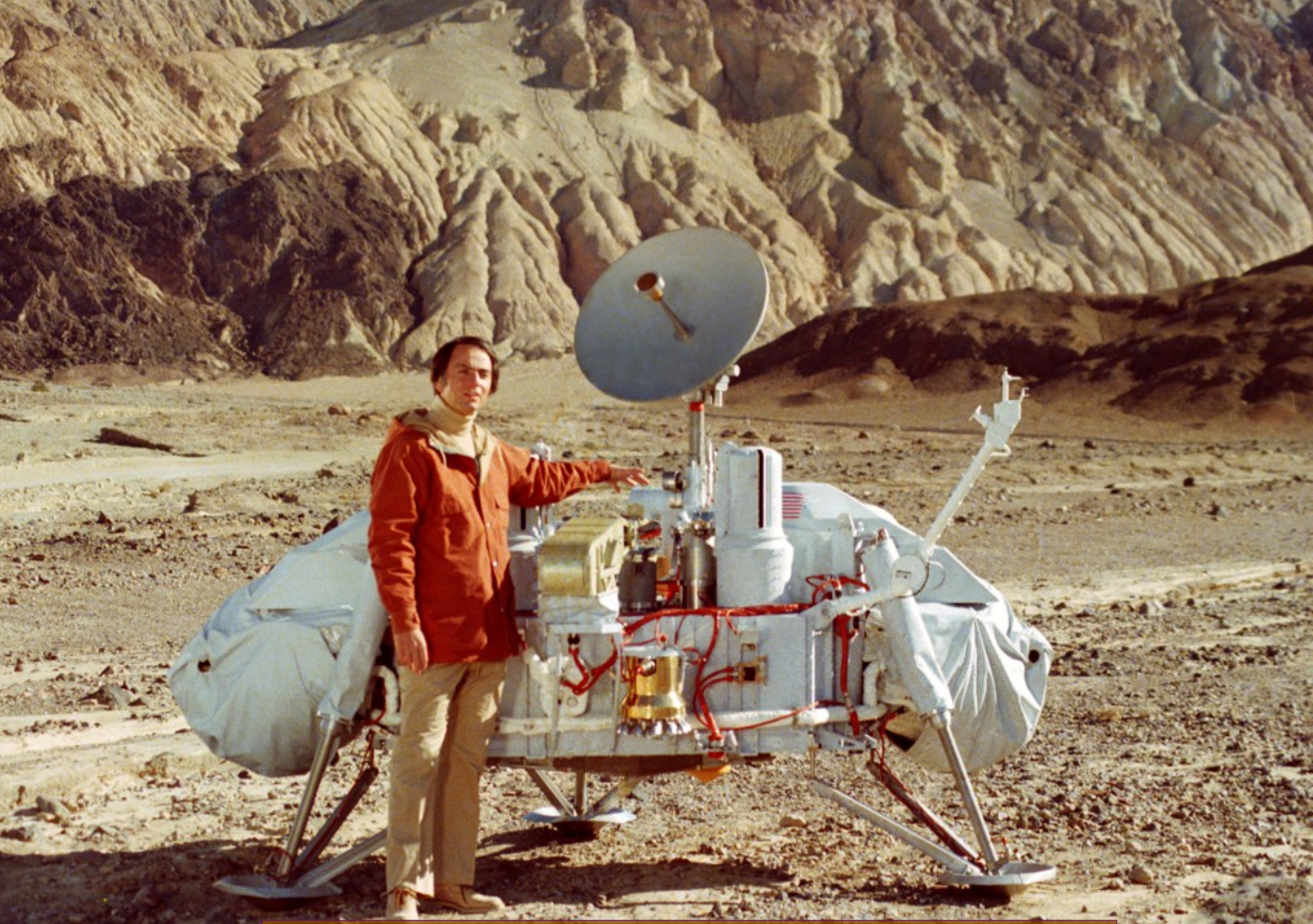


Giordano Bruno † 1600

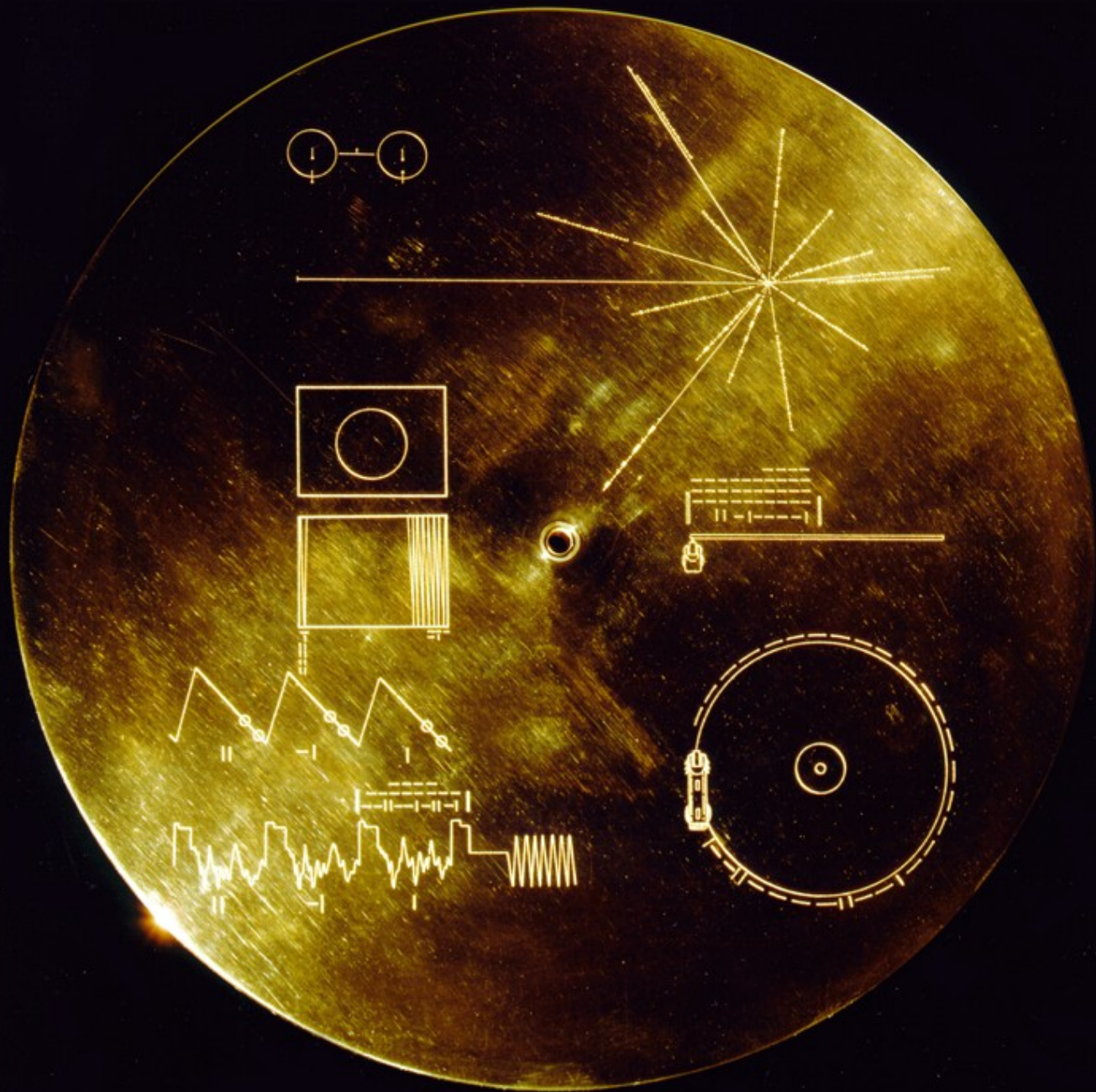


Anybody out there?

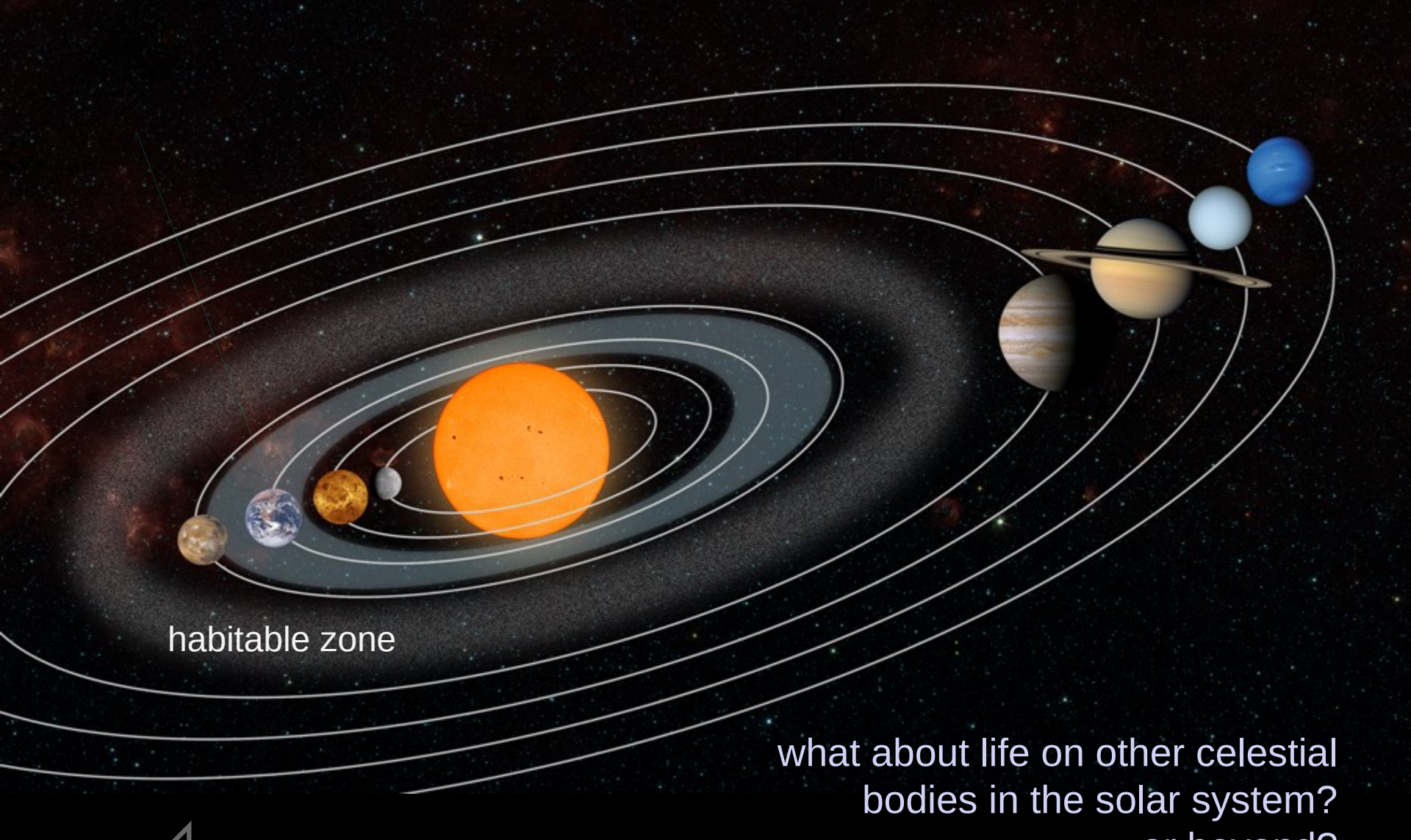




Carl Sagan (1934-1996) and a model of the Viking lander



First look over the fence: Earth's neighborhood



habitable zone

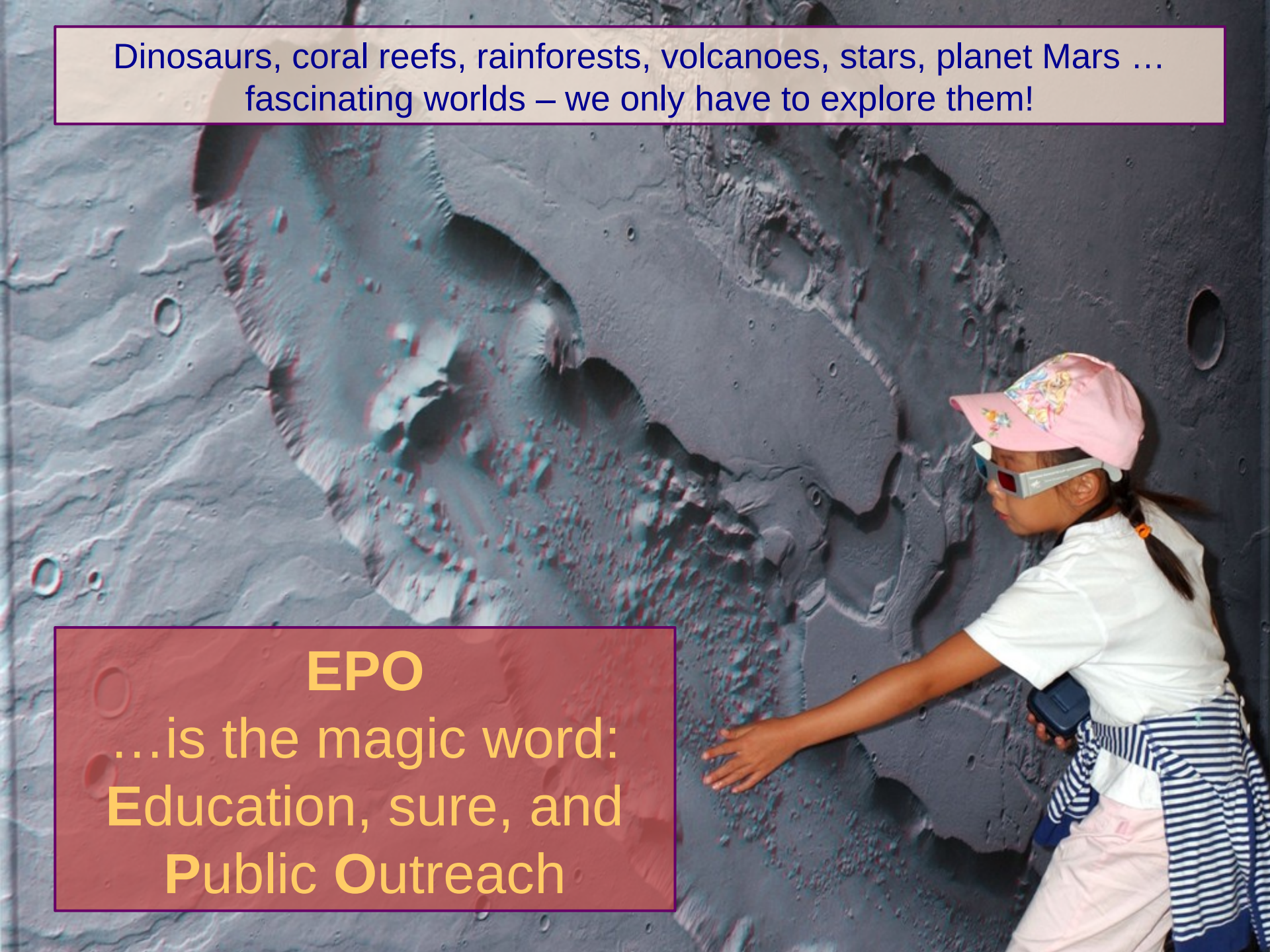
what about life on other celestial
bodies in the solar system?
or beyond?



Dinosaurs, coral reefs, rainforests, volcanoes, stars, planet Mars ...
fascinating worlds – we only have to explore them!

EPO

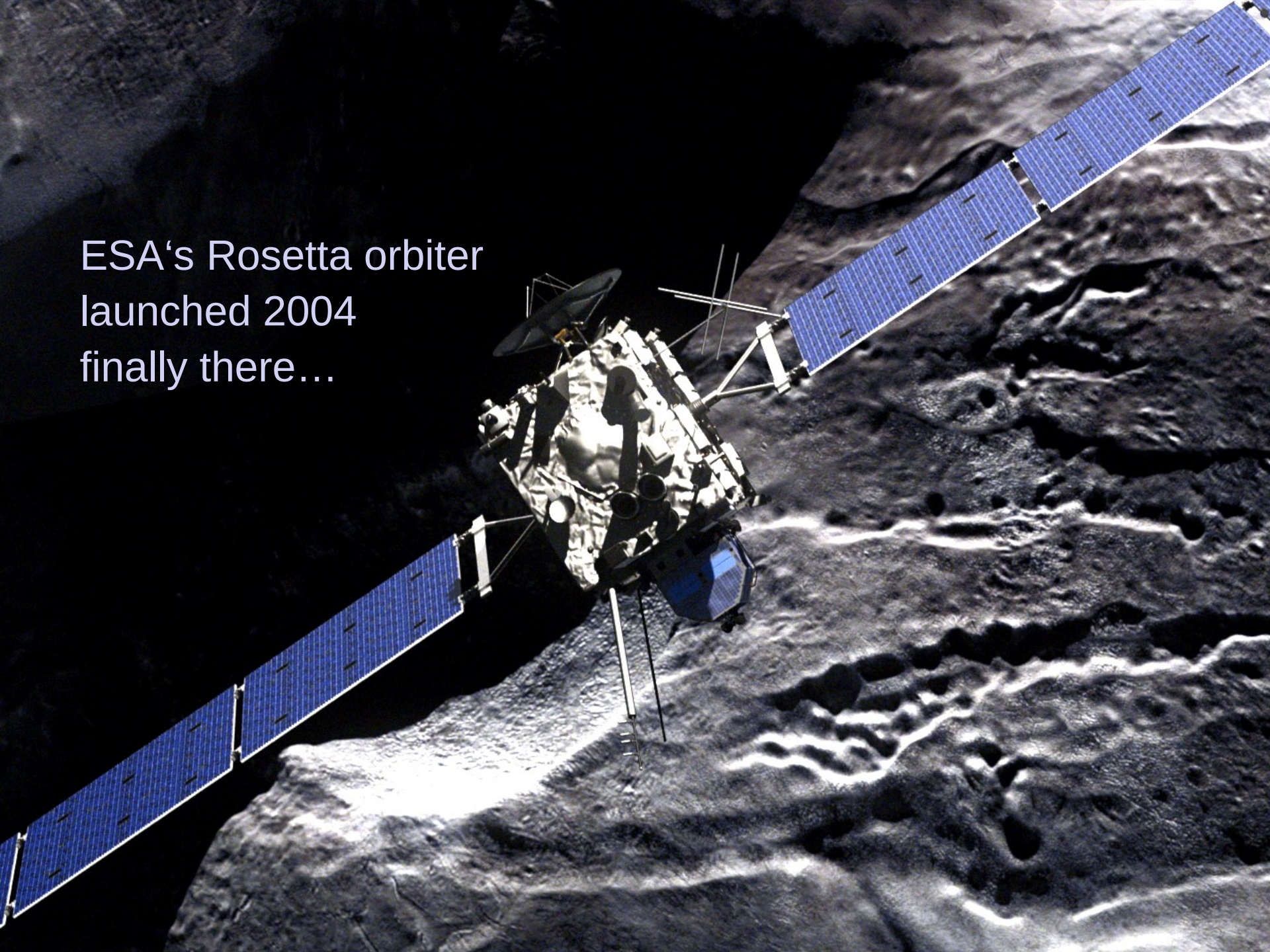
...is the magic word:
Education, **s**ure, and
Public **O**utreach



European Space Operation Centre
Darmstadt, 20 January 2014, 19.18 MEZ
Rosetta's alarm had rung!

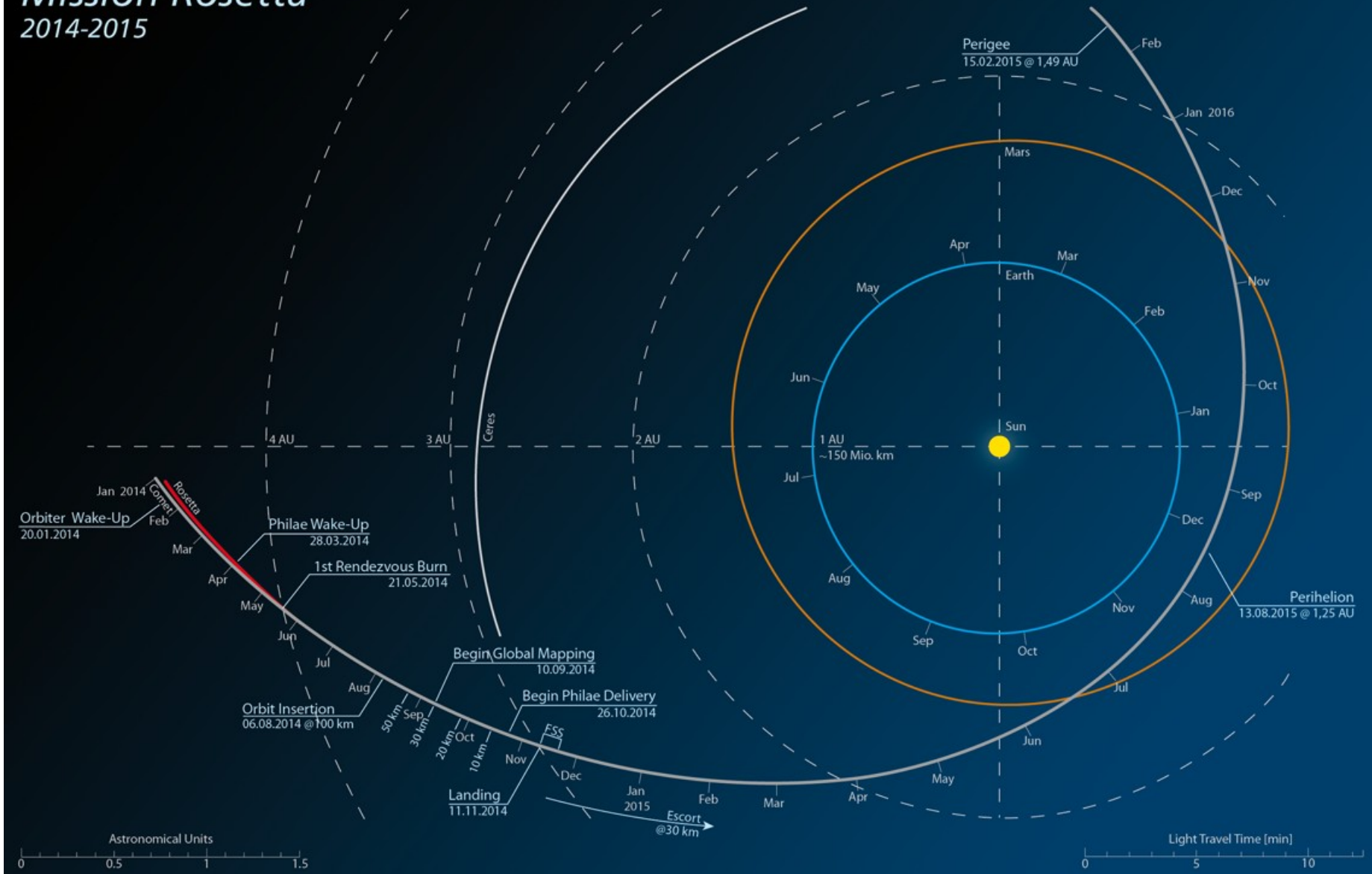


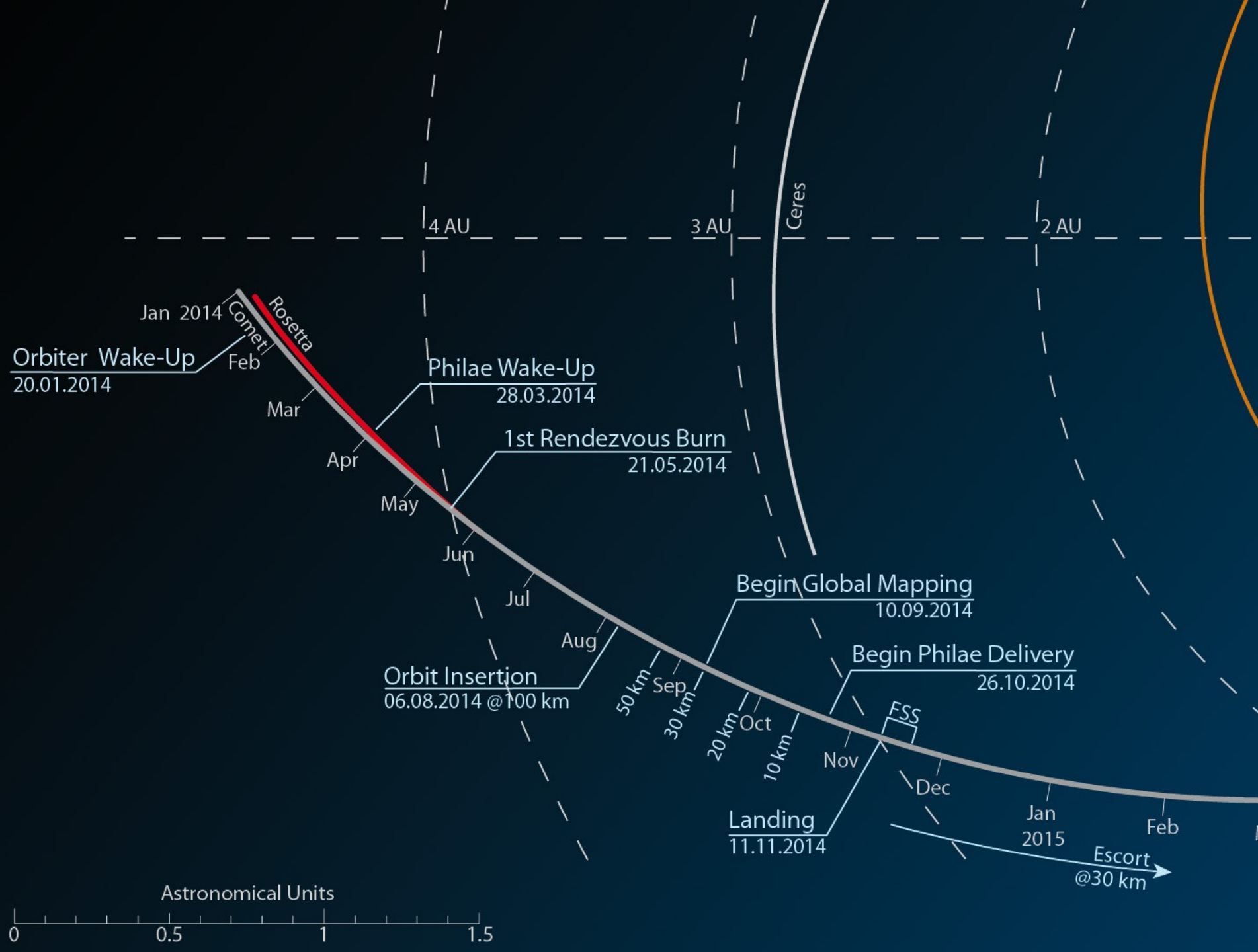
ESA's Rosetta orbiter
launched 2004
finally there...



After 10 years Europe's comet chaser *Rosetta* reaches its target

Mission Rosetta 2014-2015





Jan 2014
Orbiter Wake-Up
20.01.2014

Comet
Rosetta

Feb

Mar

Apr

May

Jun

Jul

Aug

Sep

Oct

Nov

Dec

Jan 2015

Feb

4 AU

3 AU

2 AU

Ceres

Philae Wake-Up
28.03.2014

1st Rendezvous Burn
21.05.2014

Begin Global Mapping
10.09.2014

Orbit Insertion
06.08.2014 @ 100 km

Begin Philae Delivery
26.10.2014

Landing
11.11.2014

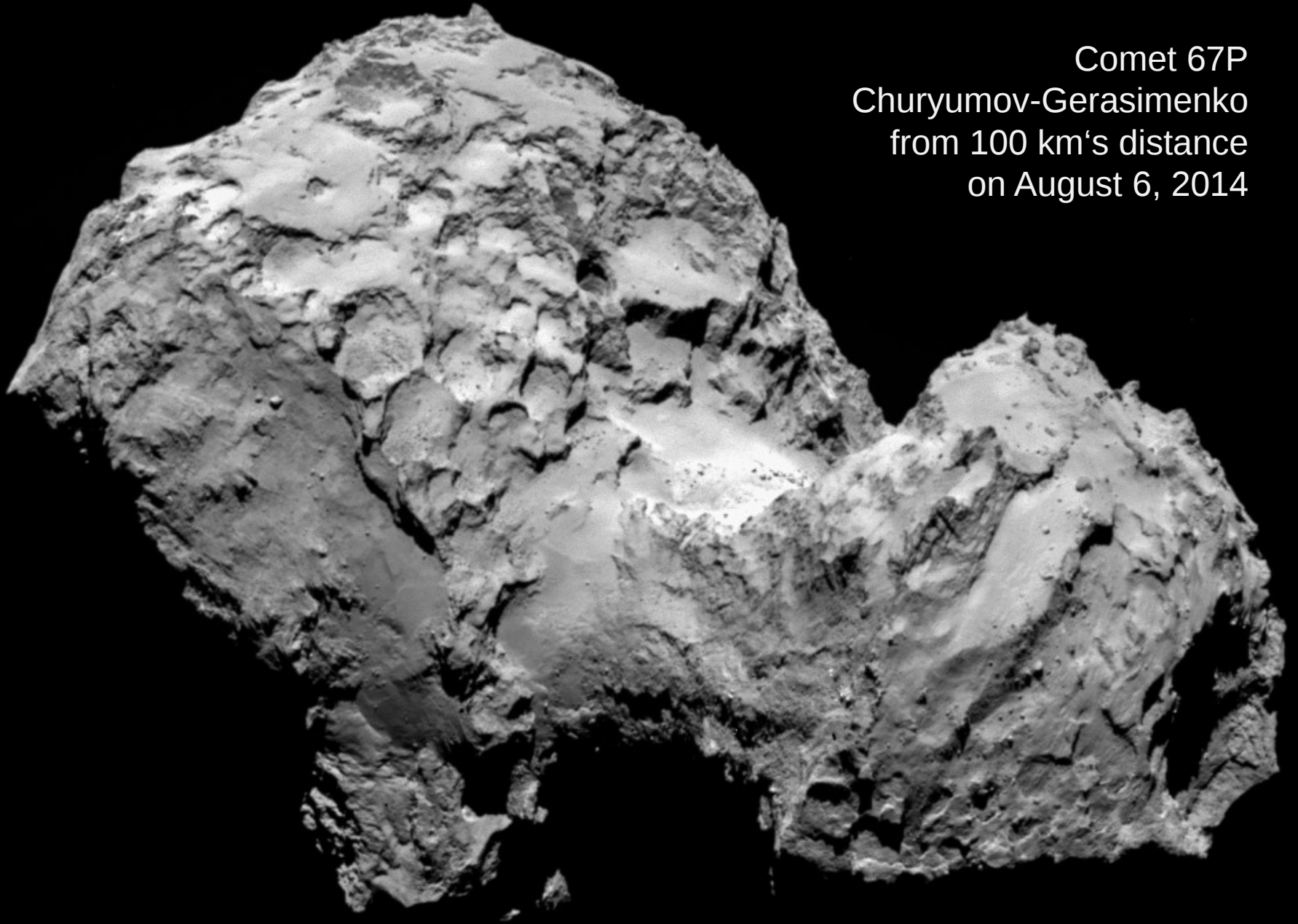
FSS

Escort
@30 km

Astronomical Units



Comet 67P
Churyumov-Gerasimenko
from 100 km's distance
on August 6, 2014



Save the Date!

Tuesday, 11
November
2014

*Rosetta –
Philae
detachment
...and Philae
landing on 67P
about 7 hours*



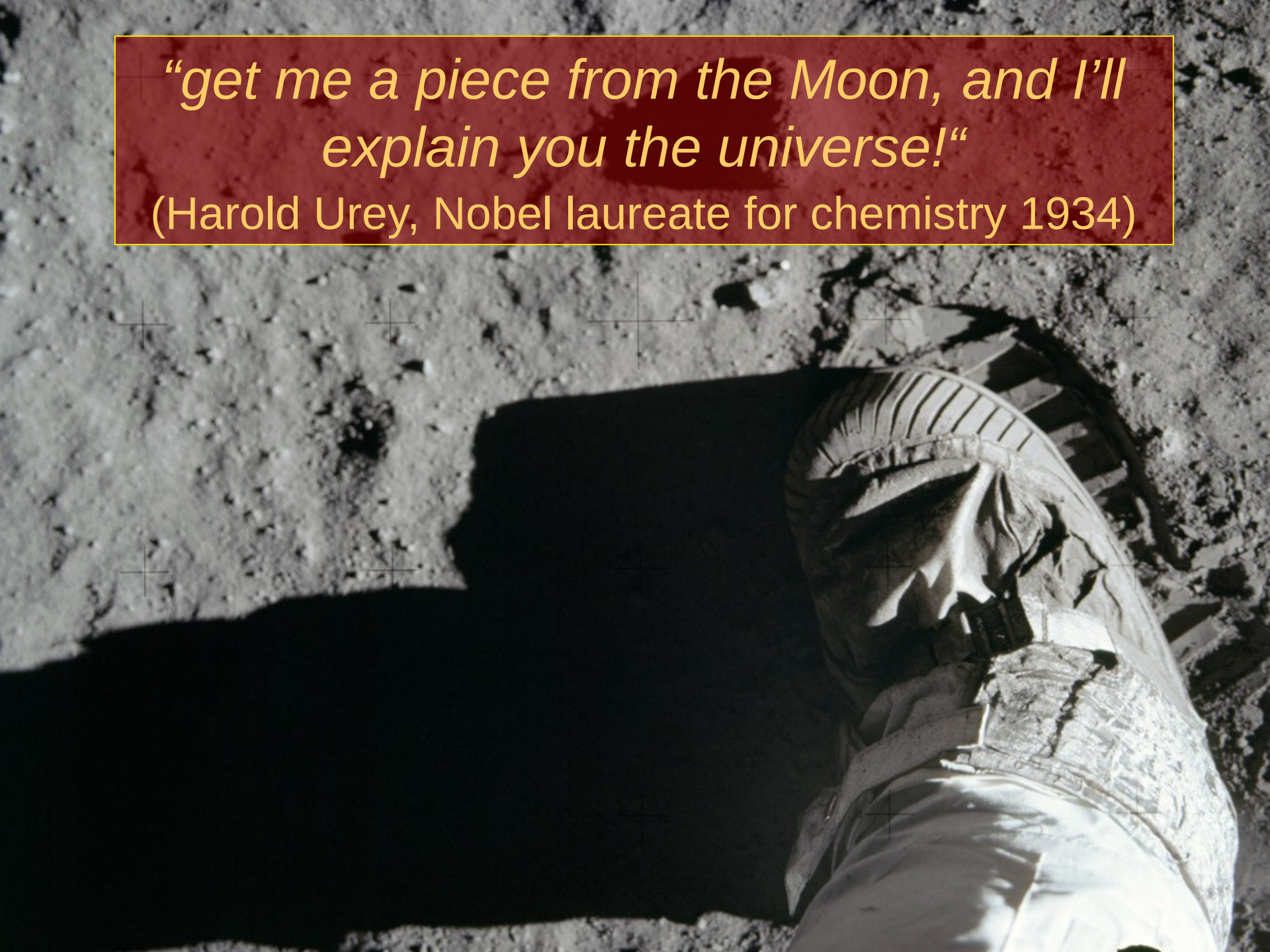


11/11
Save
The
Date!

... and find a safe place for landing

*“get me a piece from the Moon, and I’ll
explain you the universe!”*

(Harold Urey, Nobel laureate for chemistry 1934)



DLR – all around in the solar system...

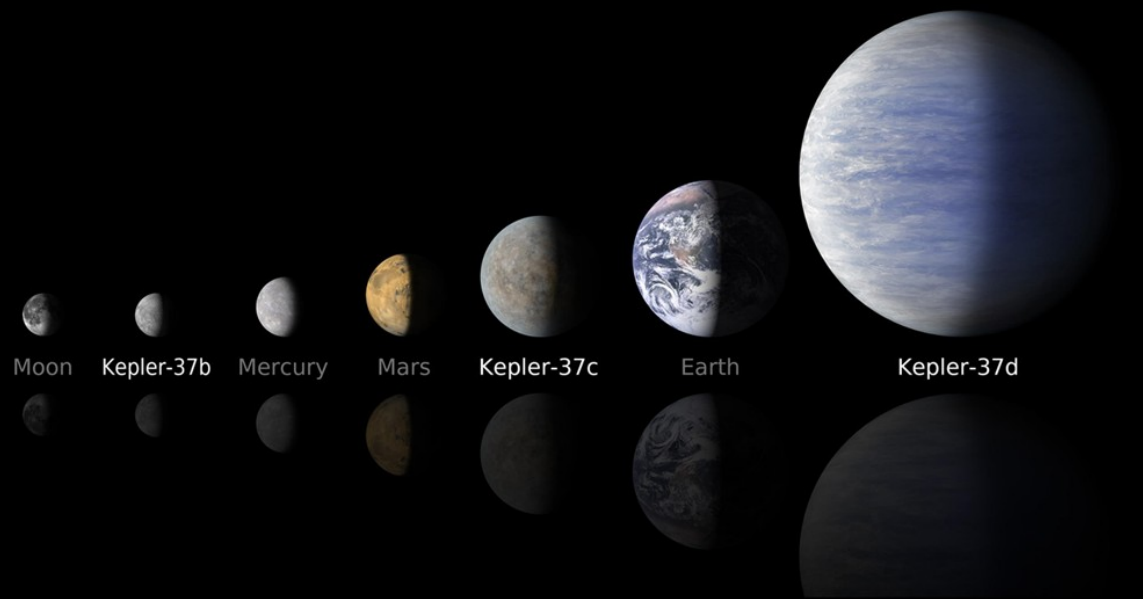
actual participation at ESA and NASA projects

- **Lunar Reconnaissance Orbiter** – NASA, Moon, until 2016
- **MESSENGER** – NASA, Mercury, until 2015
- **Venus Express** – ESA, end of 2014
- **Mars Express** – ESA, until 2016 or even 2018
- **Curiosity** – NASA's Mars Science Laboratory (MSL), at least 2022
- **Dawn** – NASA, Discovery Mission – Vesta + Ceres, end of 2015
- **Rosetta** – ESA, comet 67P/Churyumov-Gerasimenko, 2014/15
- **Cassini-Huygens** – NASA/ESA, Saturnian system, end of 2017
- **CoRoT** – space telescope, search for exoplanets, 2014 (†)
- **SOFIA** – NASA/DLR airborne IR Telescope
- **NeoShield** – EU, how to protect our planet from Near-Earth Objects?

...what about tomorrow?

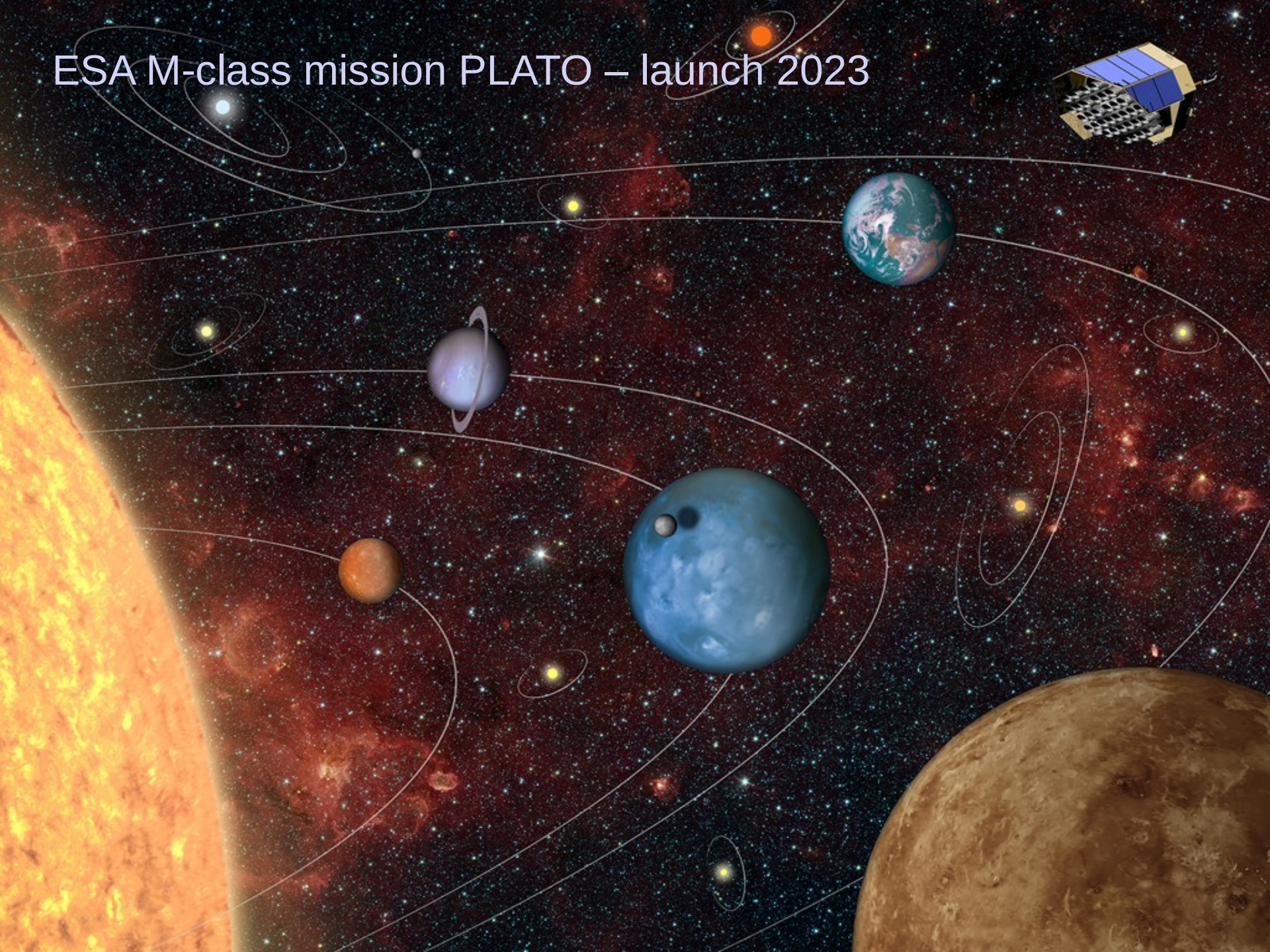
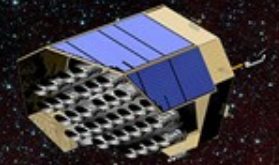
- **BepiColombo** – ESA, Mercury, launch 2016, arrival 2022/23
- **InSight** – NASA, Mars stationary lander, German/French payload; 2016
- **MASCOT** – lander for Japan's asteroid mission Hayabusa II, launch 2014
- **ExoMars** – ESA Orbiter und lander, 2016 and 2018, with Russia (?)
- **JUICE** – Jupiter Icy Moon Explorer, ESA – 2022 until ...2030!
- **PLATO** – ESA M-class mission in search for extrasolar planets: 2023
- **Marco-Polo R** – ESA M3-competitor, 2020 the earliest
- **Mars sample return** – *we have a dream...*

extrasolar planetary system KOI 351, our solar system

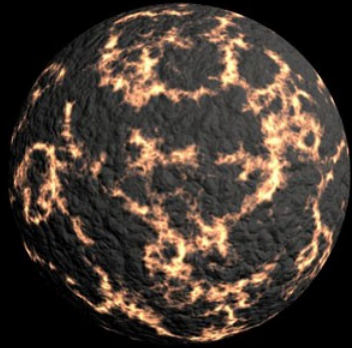


— KOI 351
— Sonnensystem

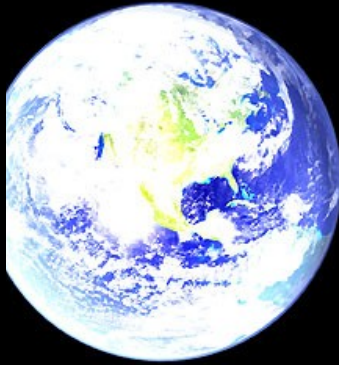
ESA M-class mission PLATO – launch 2023



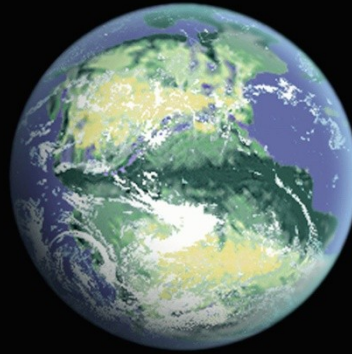
It's one of the hottest topics in astronomy: searching Earth 2.0



magma



snowball



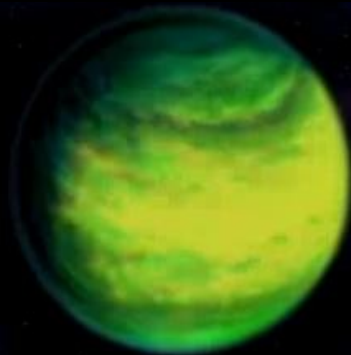
jurassic



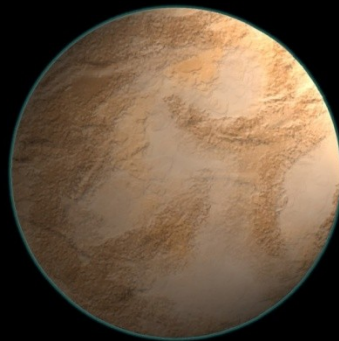
young Mars



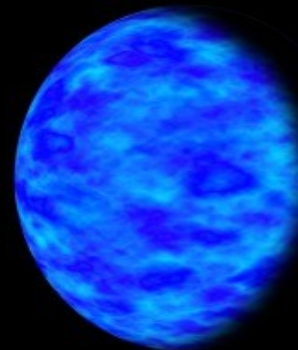
young Venus



dessert world



water world



super Earth

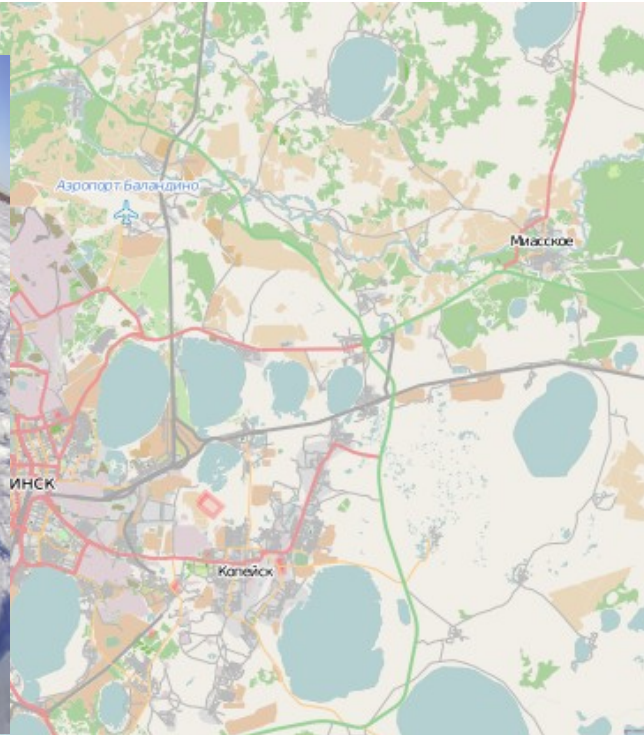


Whether we're alone in the universe: find out!
But there's definitely some dangerous stuff around



n für Morgen

 - Tscheljabinsk, 15. Februar 2013
Chelyabinsk bolide, 2013



Lessons learned from Chelyabinsk:

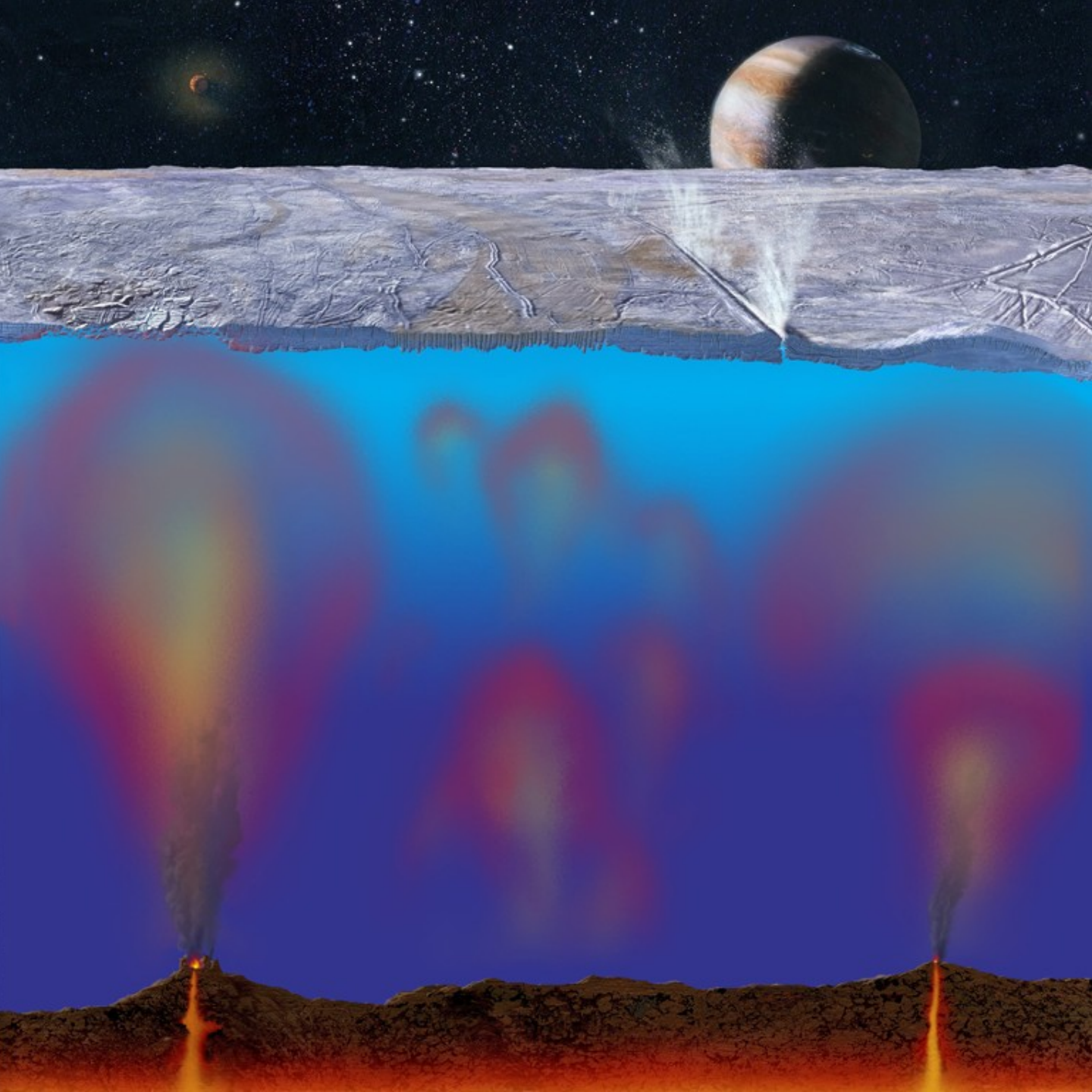


keep off the windows!!





Have some extra time...?
ESA mission JUICE
launch: 2022 – arrival: 2030



Europa

a
sub-
crustal
ocean?

