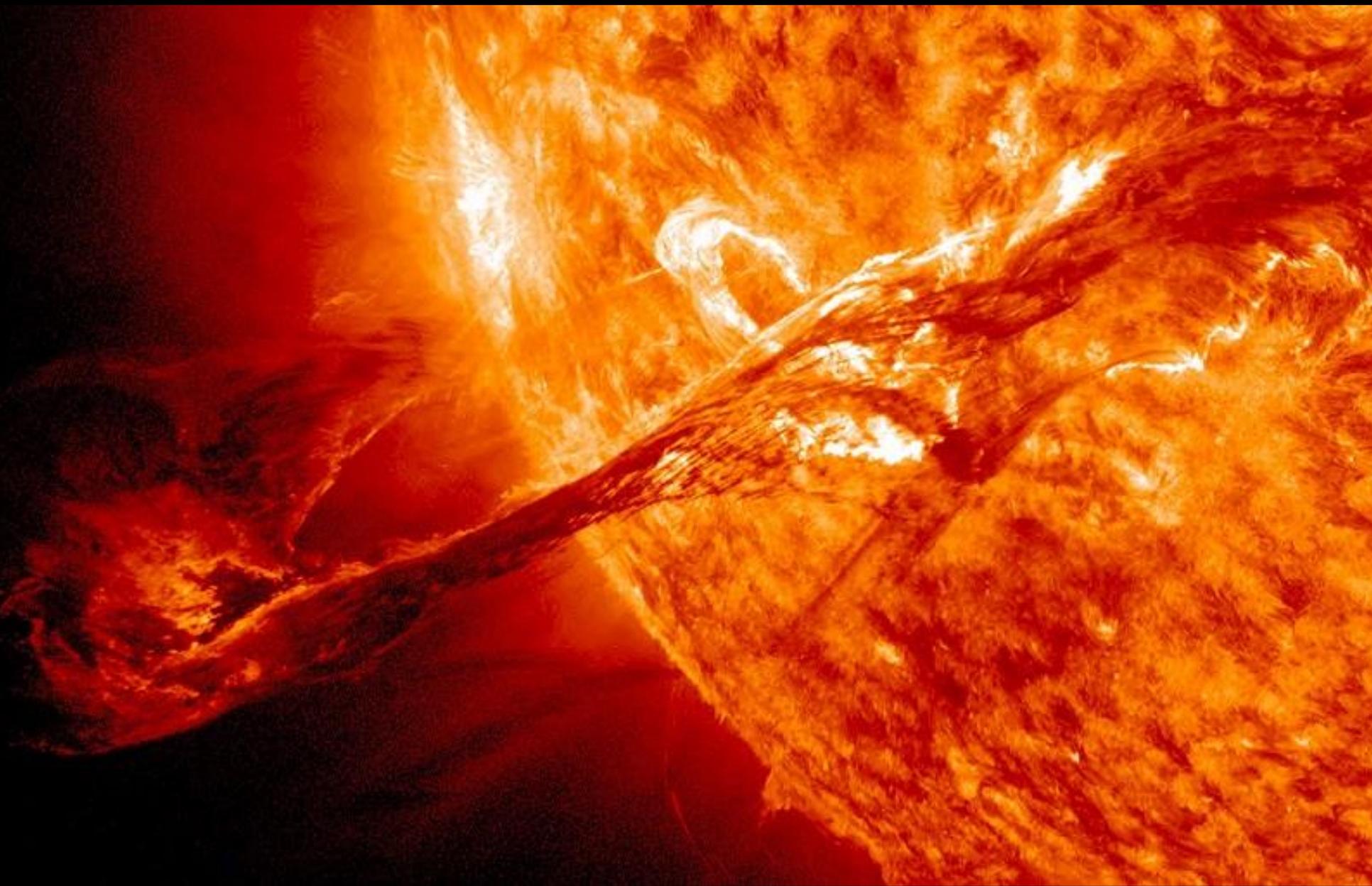
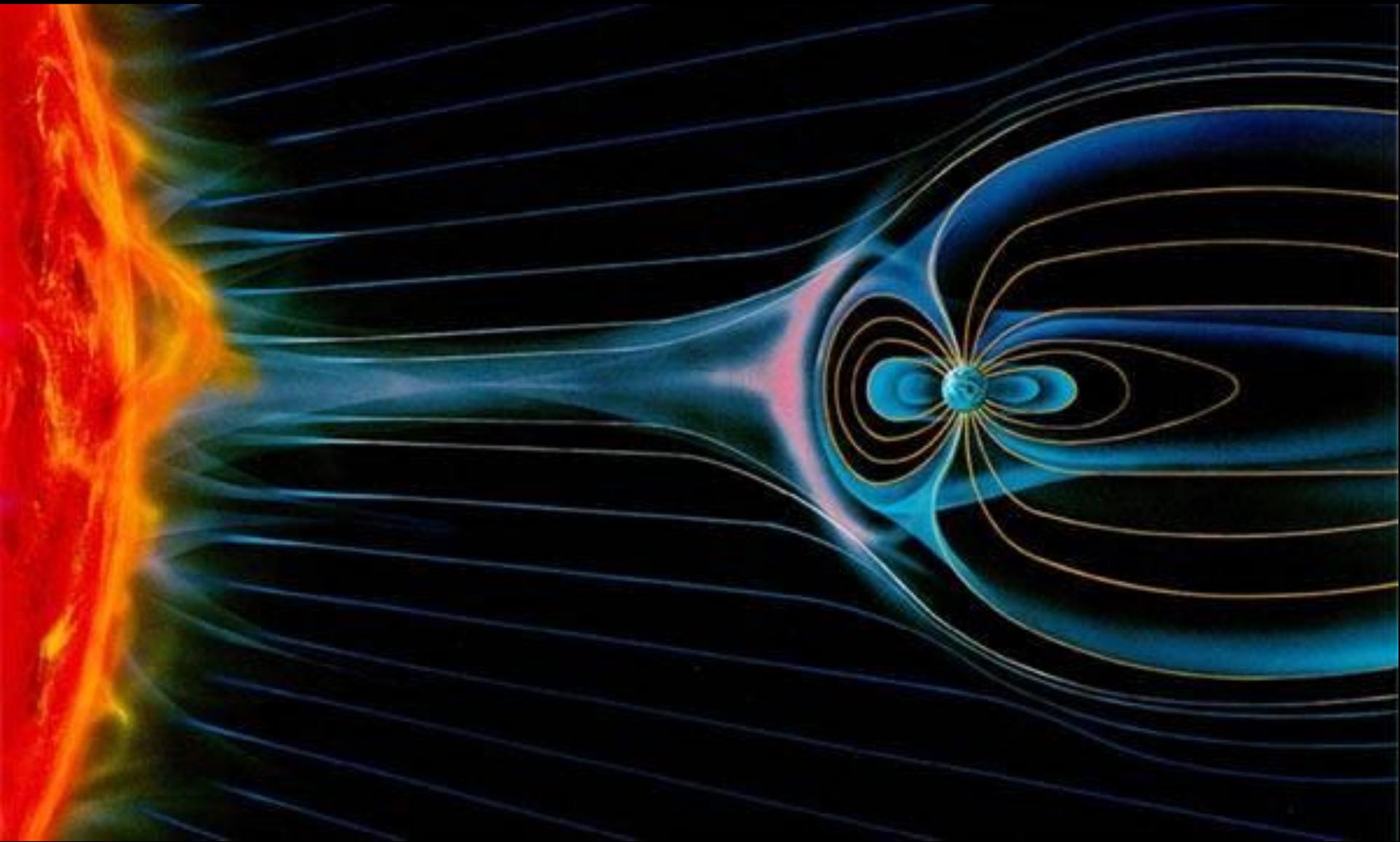


# *Cesty ke vzdáleným světům*

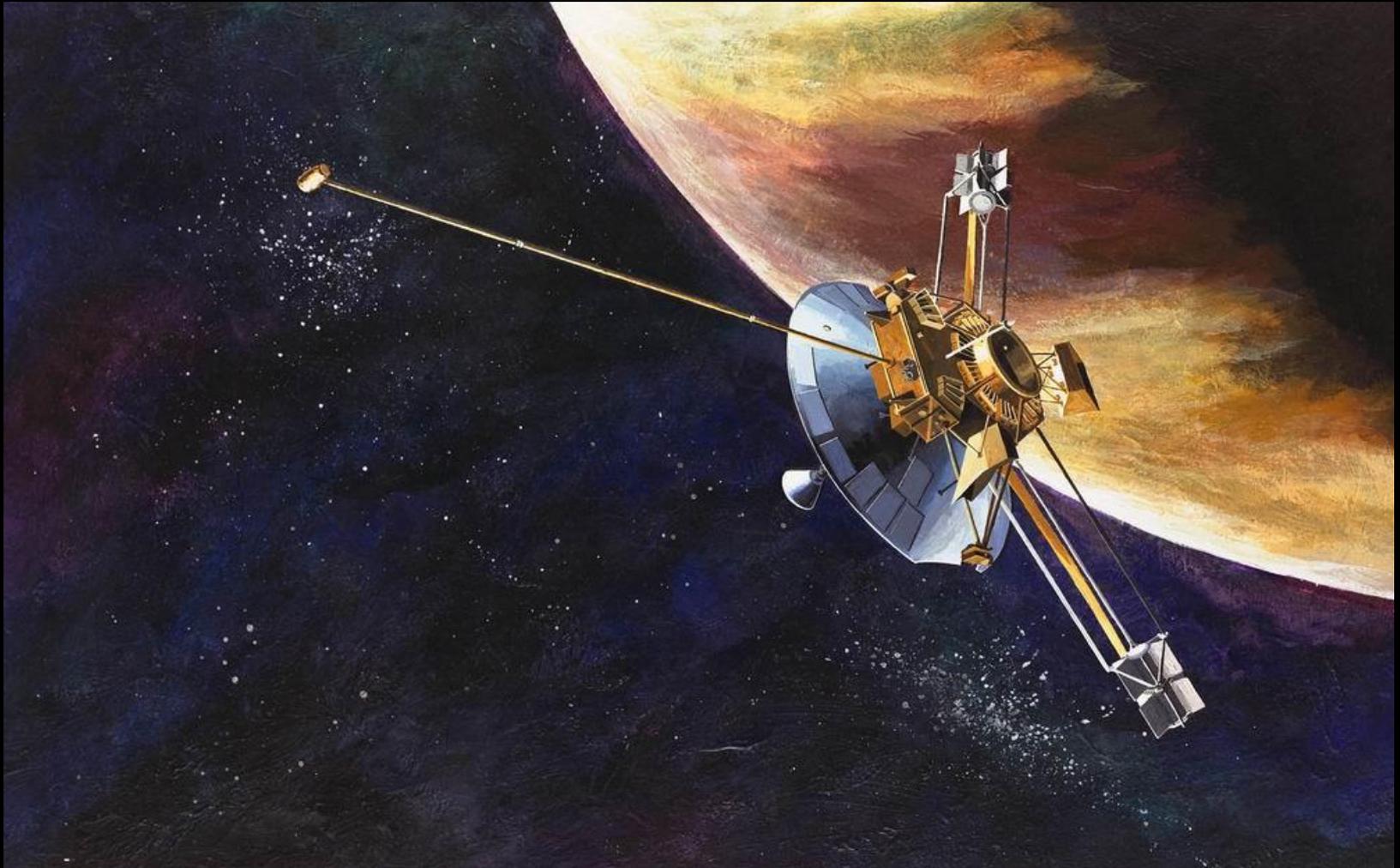
A large, multi-masted sailing ship is shown on a dark sea under a night sky. A large, glowing planet or moon is visible in the background, casting a bright light on the water. The scene is atmospheric and evokes a sense of exploration and discovery.

Tomáš PŘIBYL  
[tomas.pribyl@seznam.cz](mailto:tomas.pribyl@seznam.cz)  
[www.kosmonaut.cz](http://www.kosmonaut.cz)





# Pioneer 6 až 9



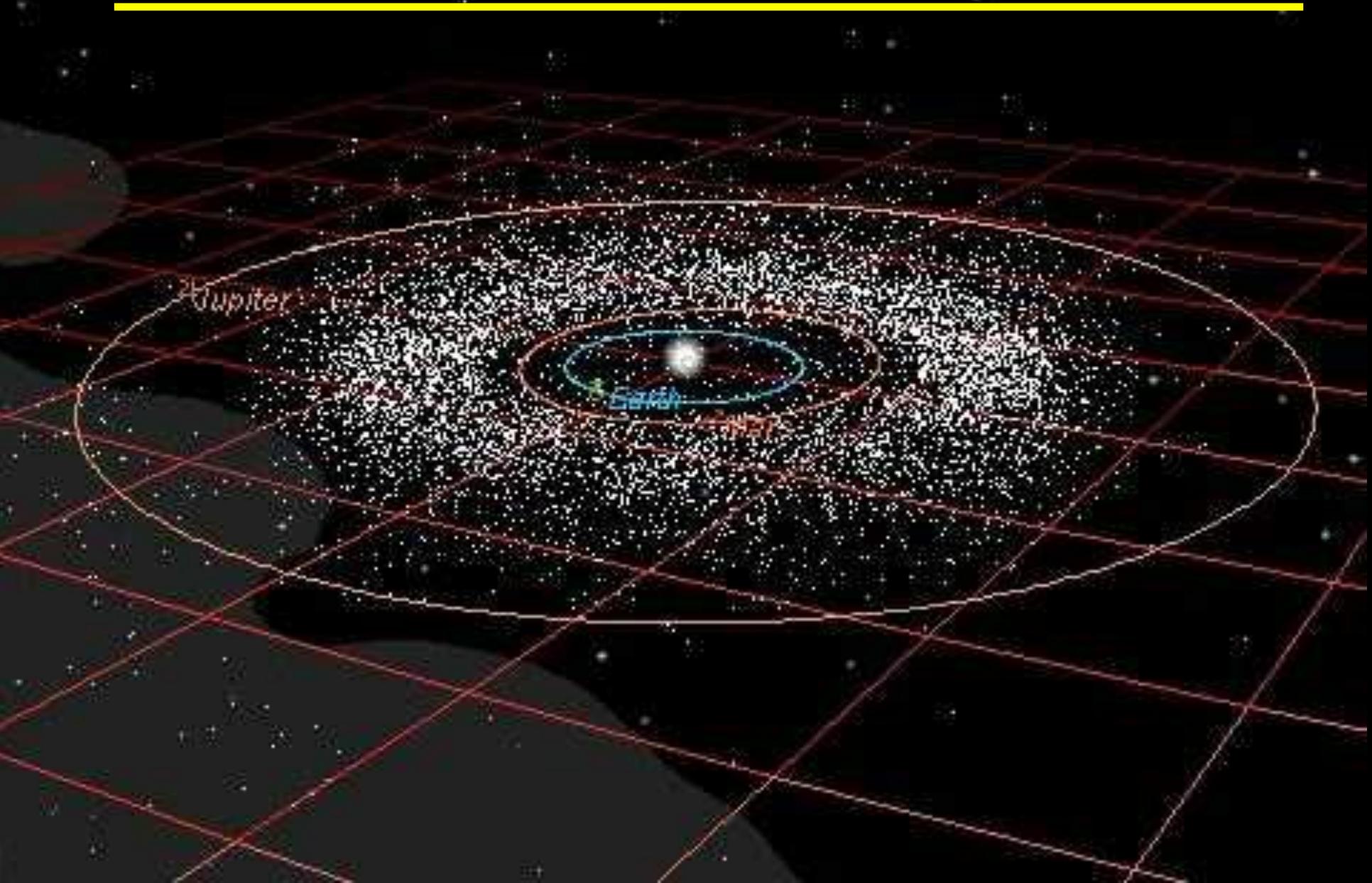
*4 AU, Jupiter Galactic Probe*

# Pioneer 10: 2. března 1972



**14,36 km/s**

# Červenec 1972 až únor 1973

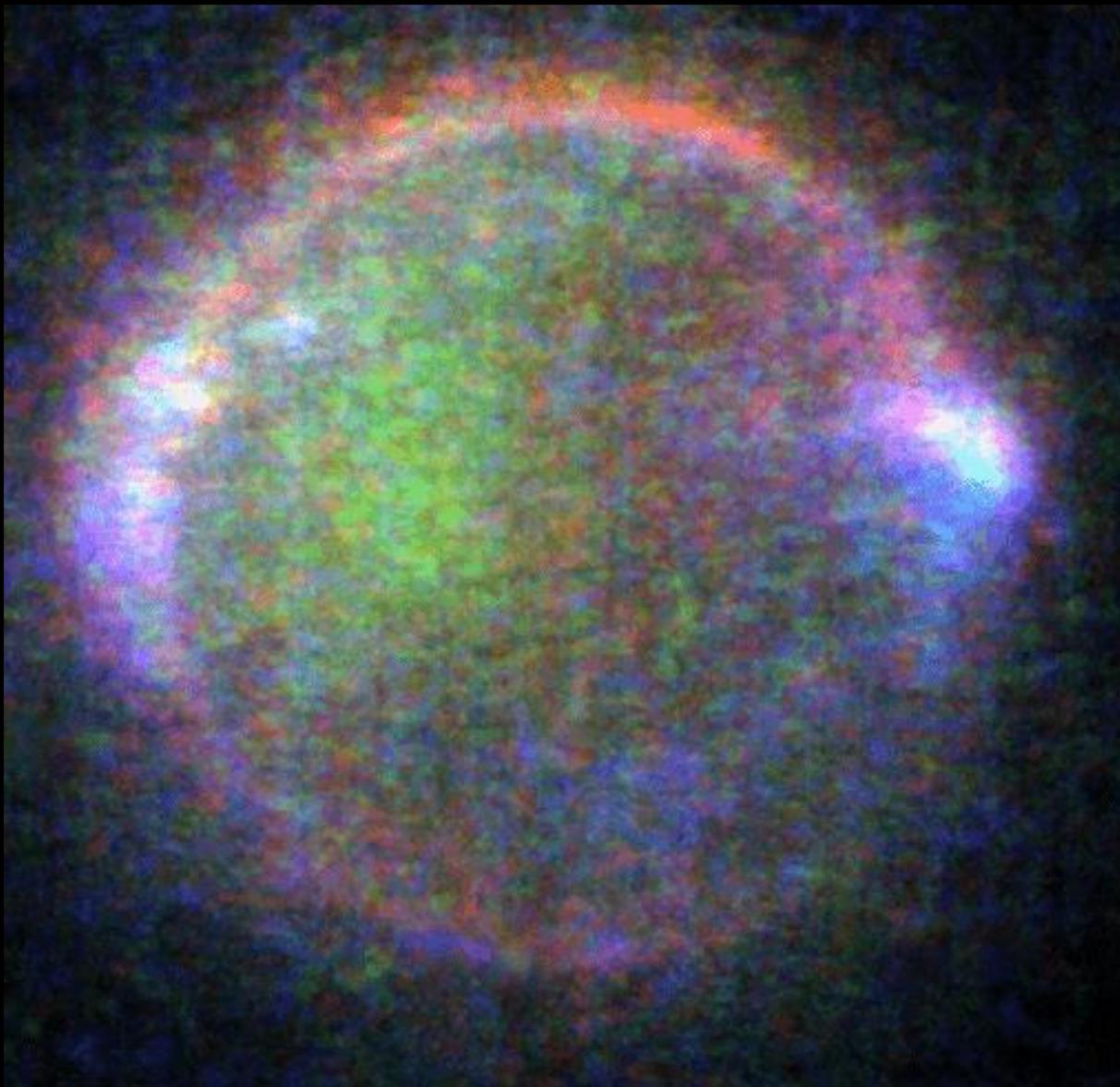


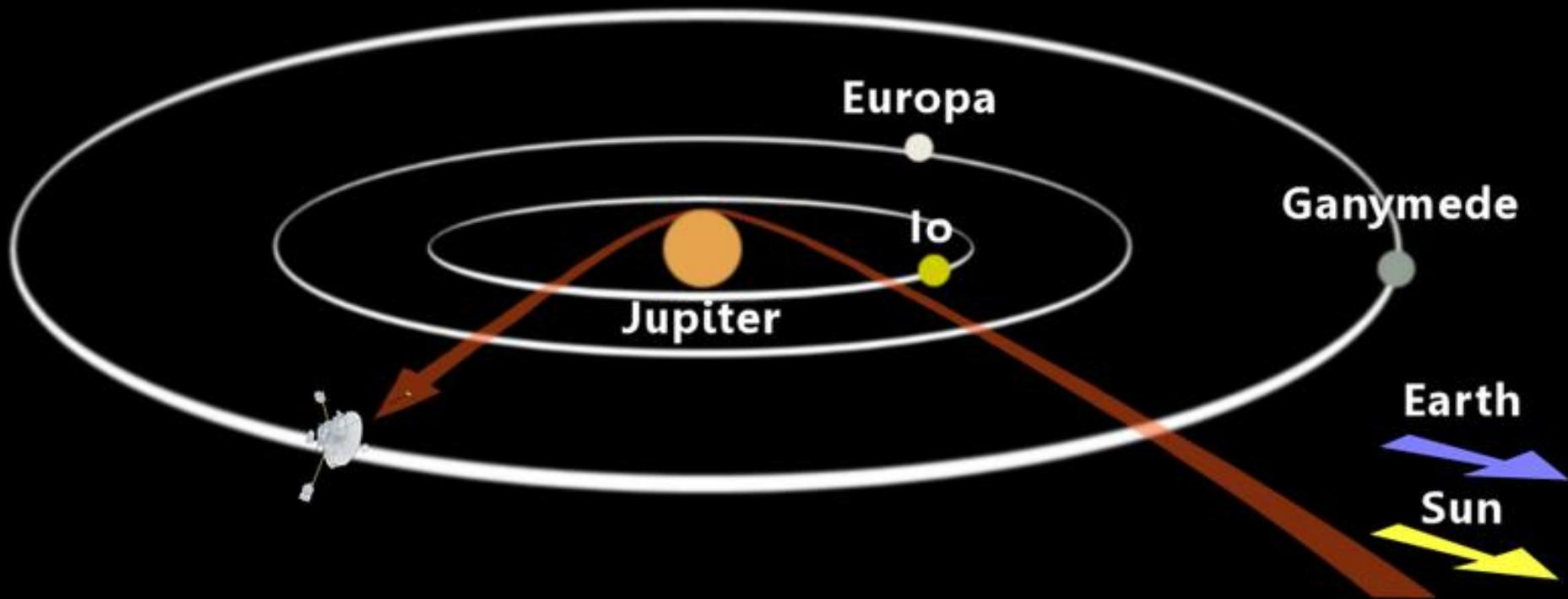
4. prosince 1973, 132252 km



**Ganymedes**

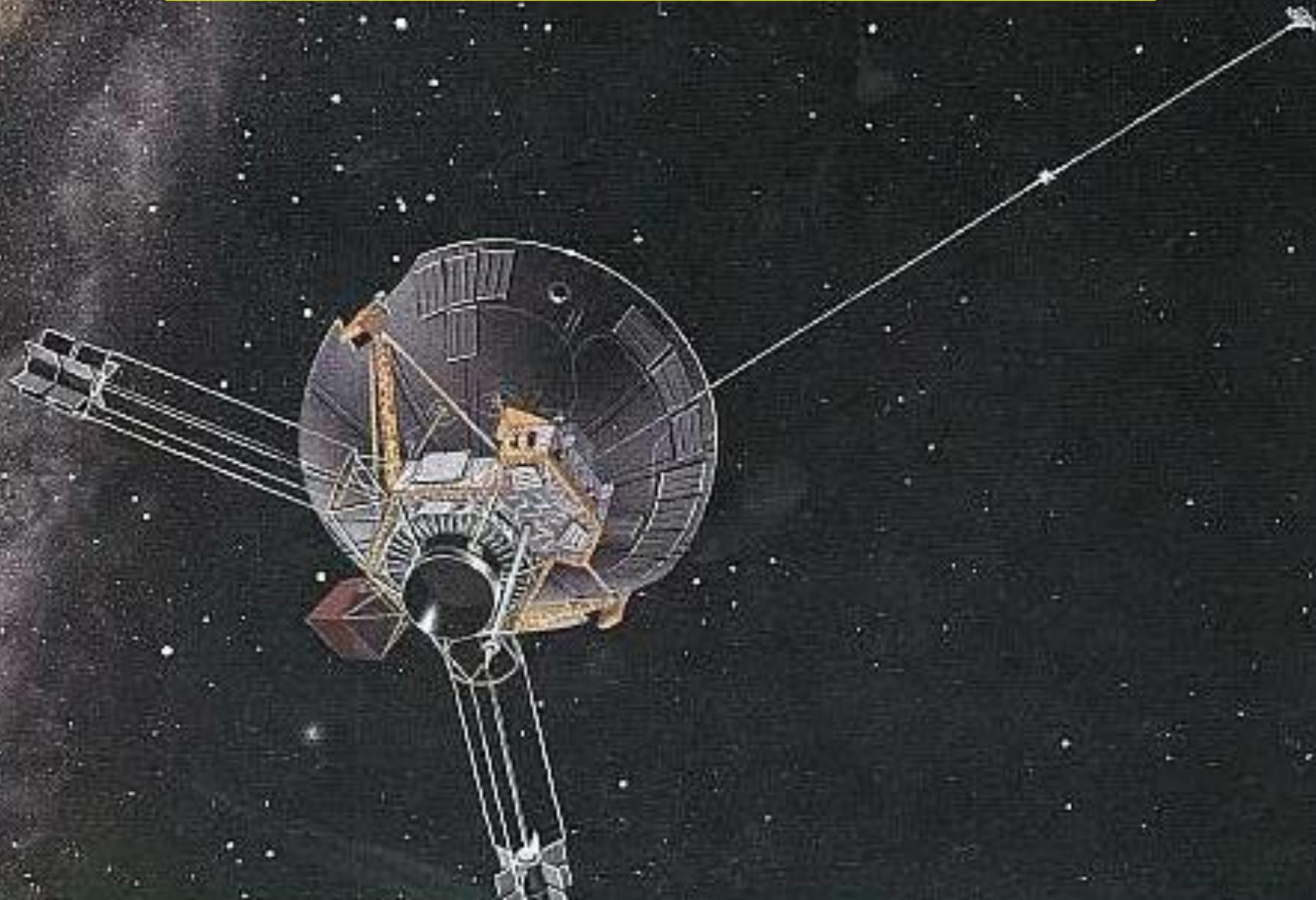
# *Io - vodíkový chvost*





bez počítače - pět povelů

23. Iedna 2003, 80 AU



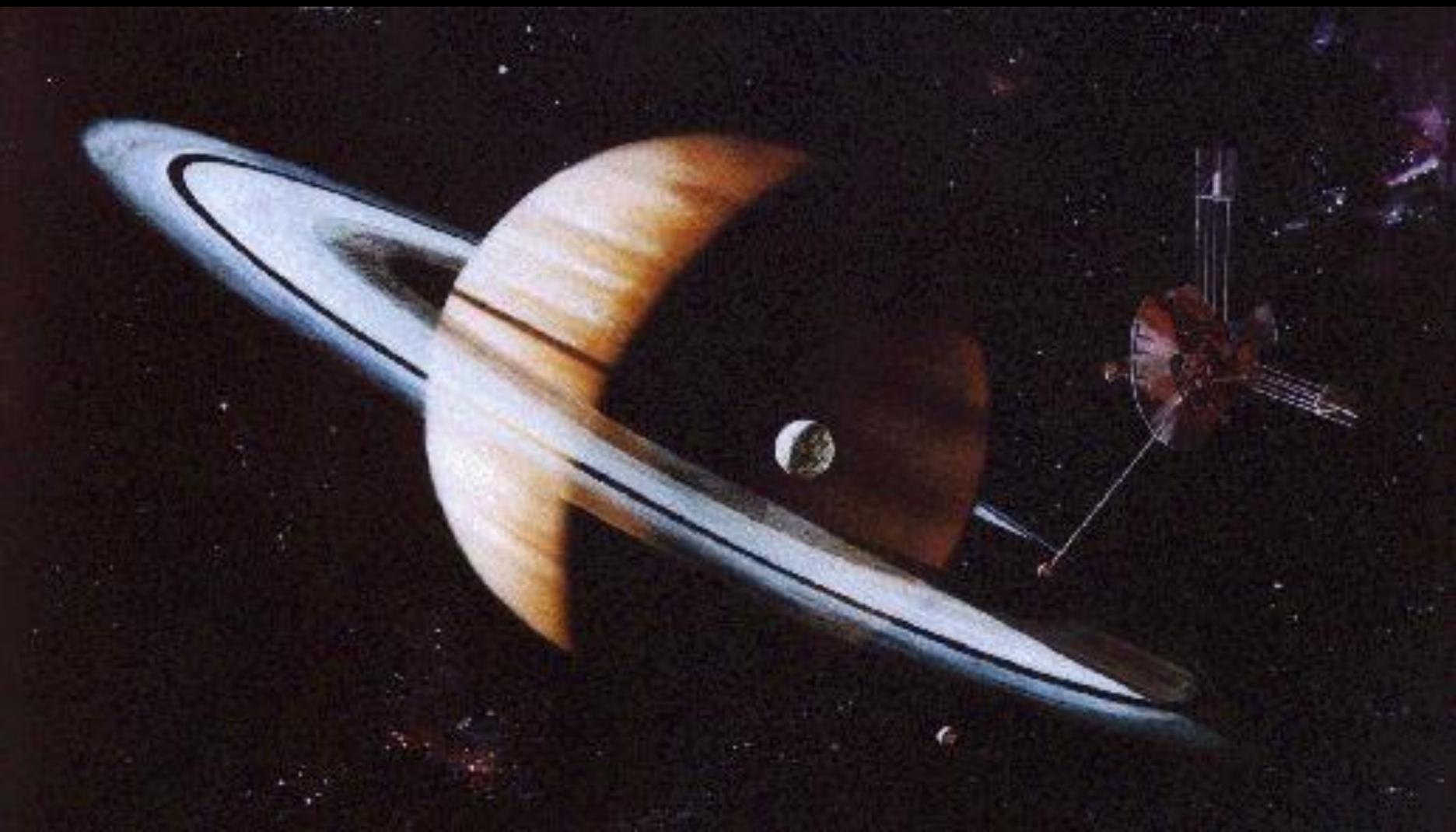
4. dubna 1973



## 2. prosince 1974



1. září 1979



Uran (1985),  
Jupiter/Neptun, 33 komet

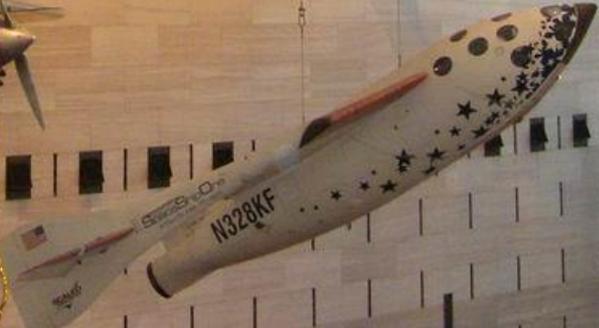


*Game Over: 30. září 1995*



# Pioneer-H (Pioneer-12)

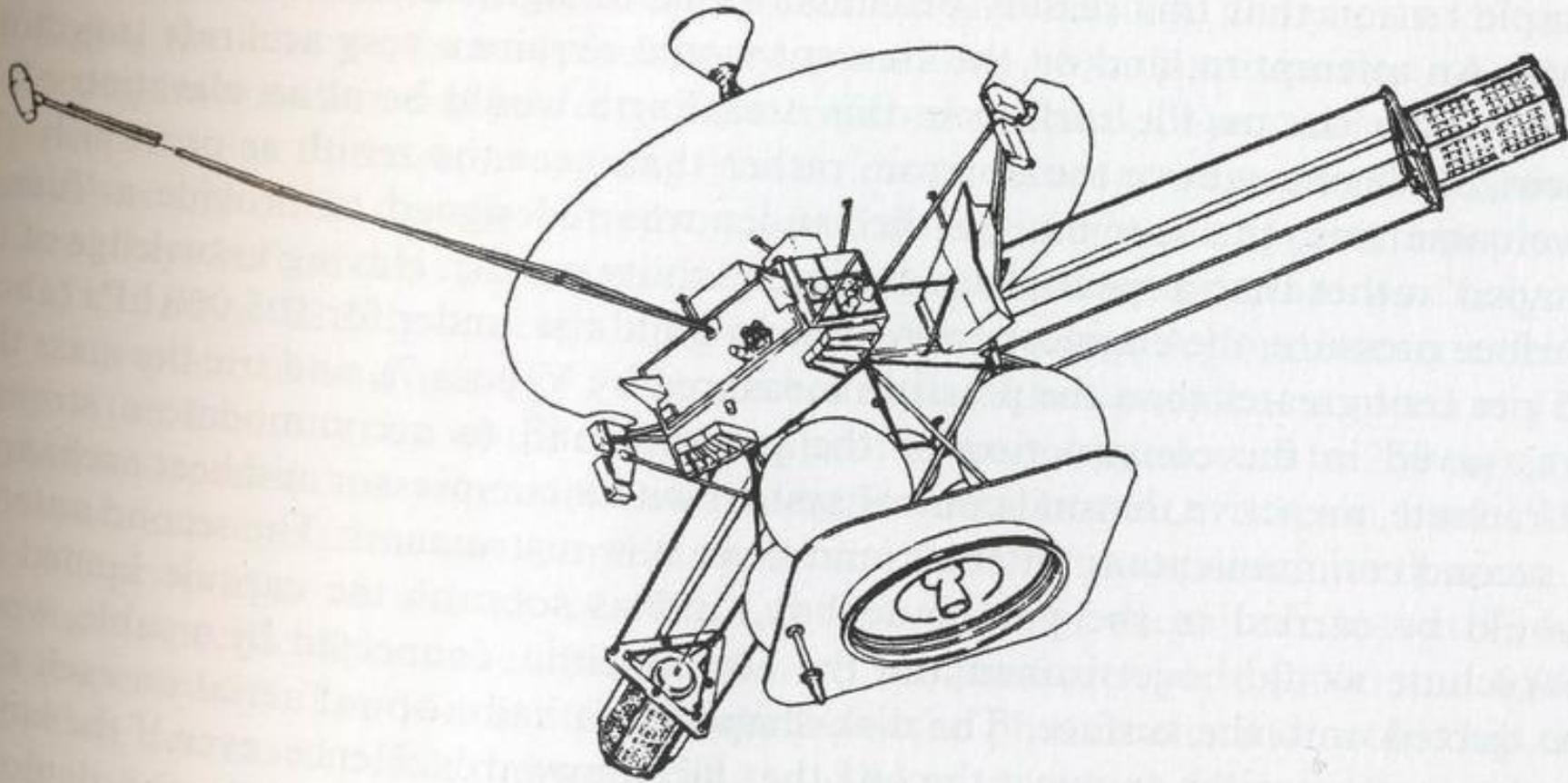




NOW SHOWING  
JOURNEY TO THE STARS

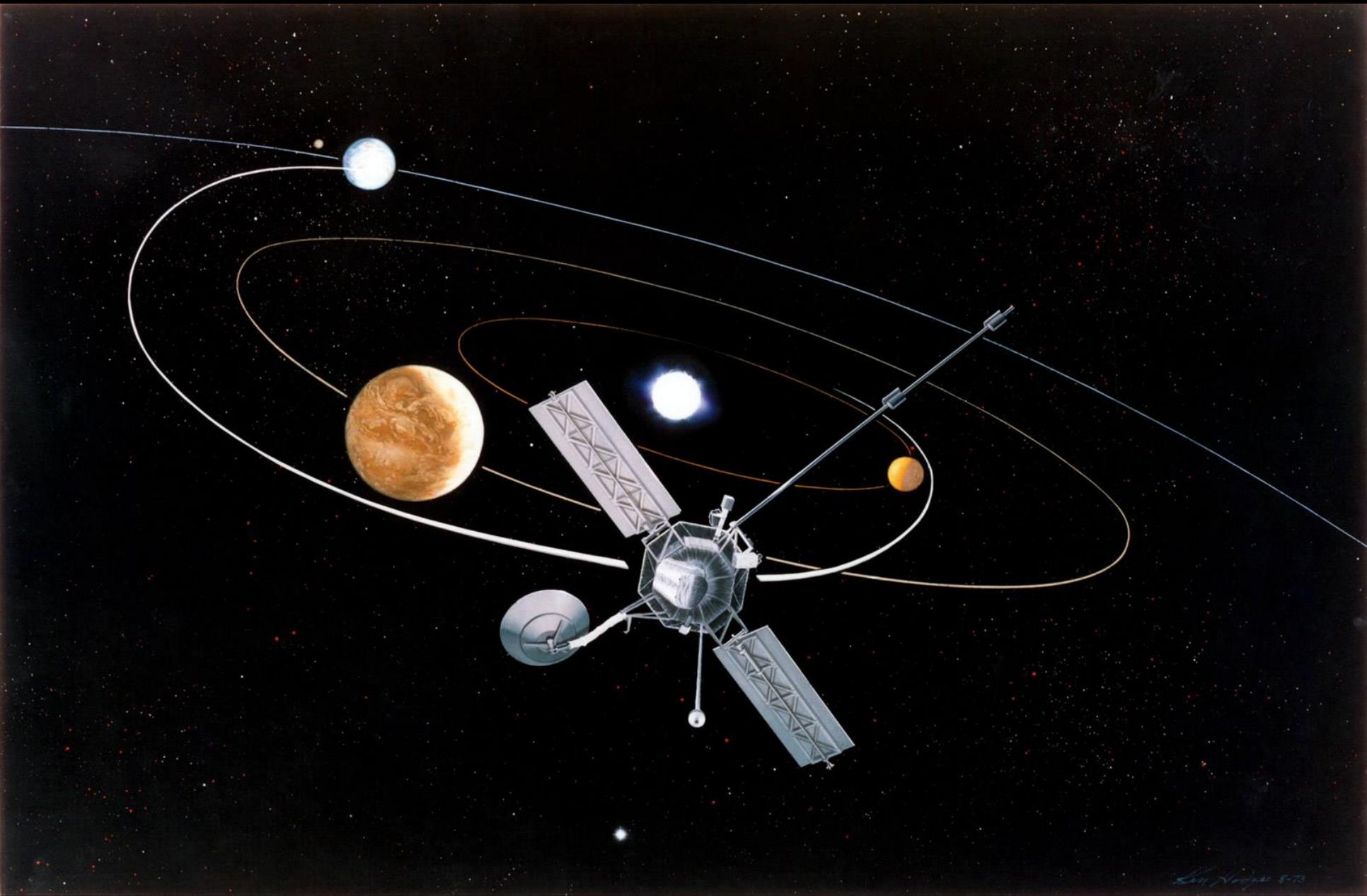


# Pioneer Outer Planets Orbiter



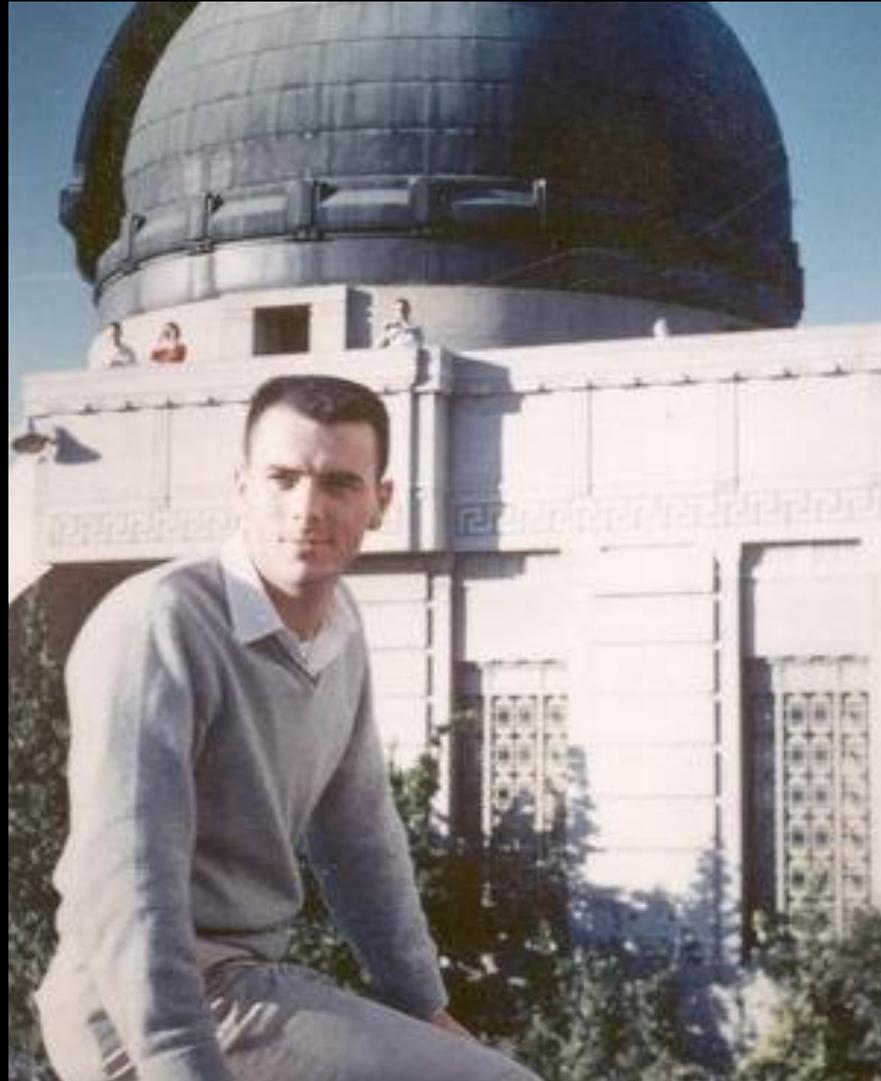
A. J.

**VOYAGER**



Kennerly 8-73

# Gary Flandro



1977:

J-S-P

J-S-U-N

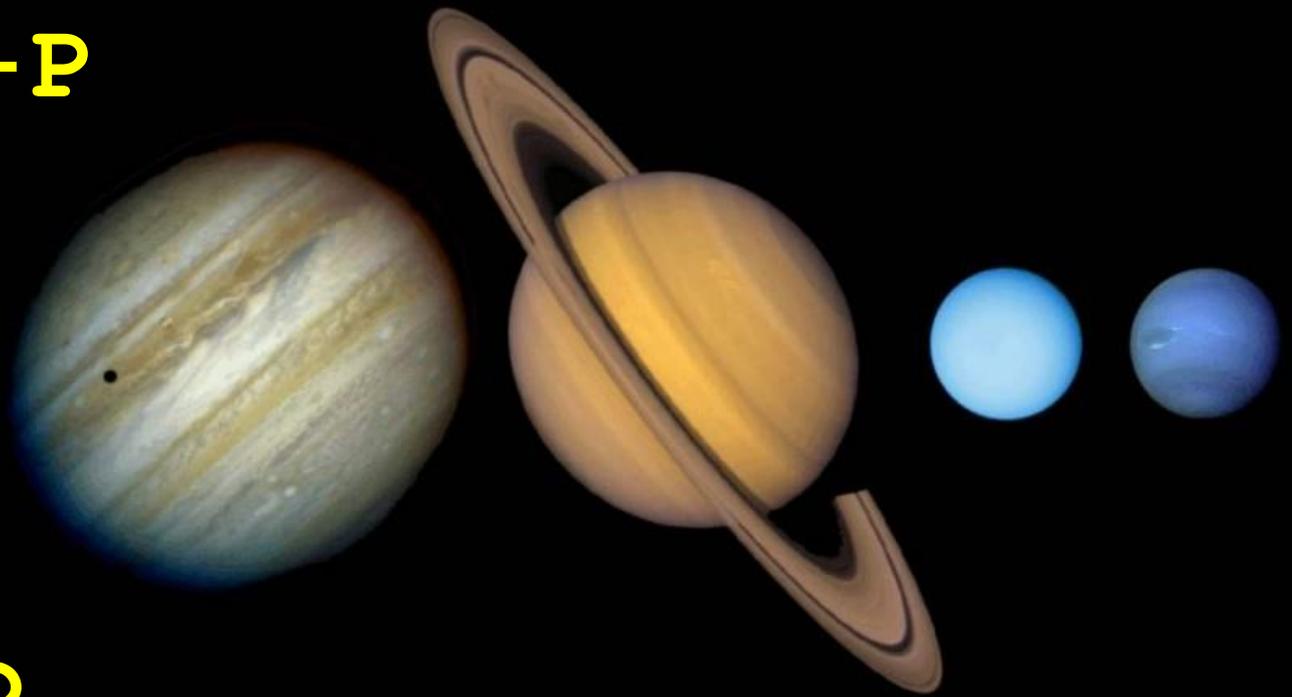
J-S-U-N-P

1979

J-U-N

1995:

J + něco



# Dva nosiče

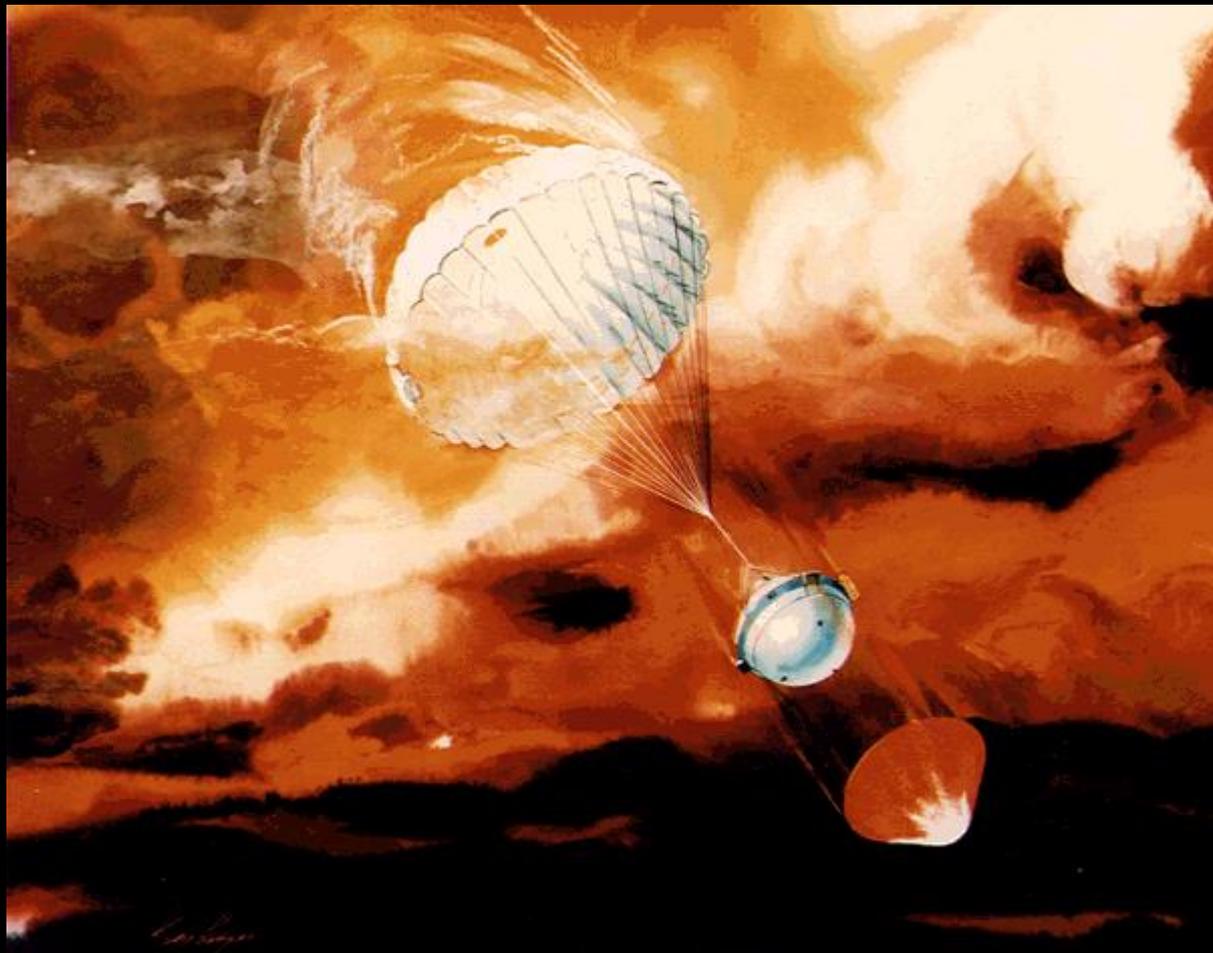


**Titan III (700 kg)**

**Saturn V + Centaur (4300 kg)**

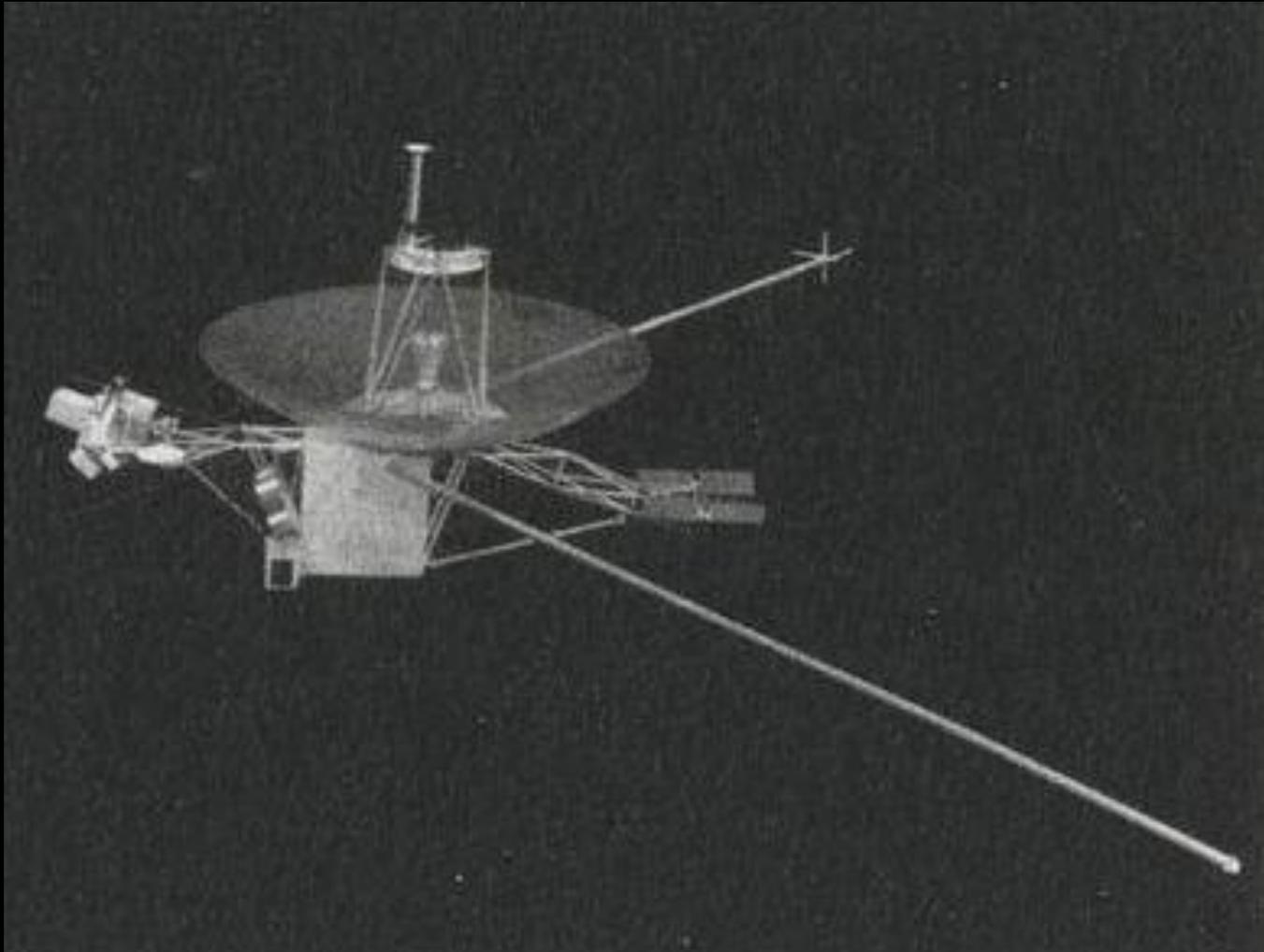
# Návrh Amesova střediska

Výsadkový modul do atmosféry Jupitera.



# TOPS

## Thermoelectric Outer Planet Spacecraft



*Prosinec 1971 zrušeno*

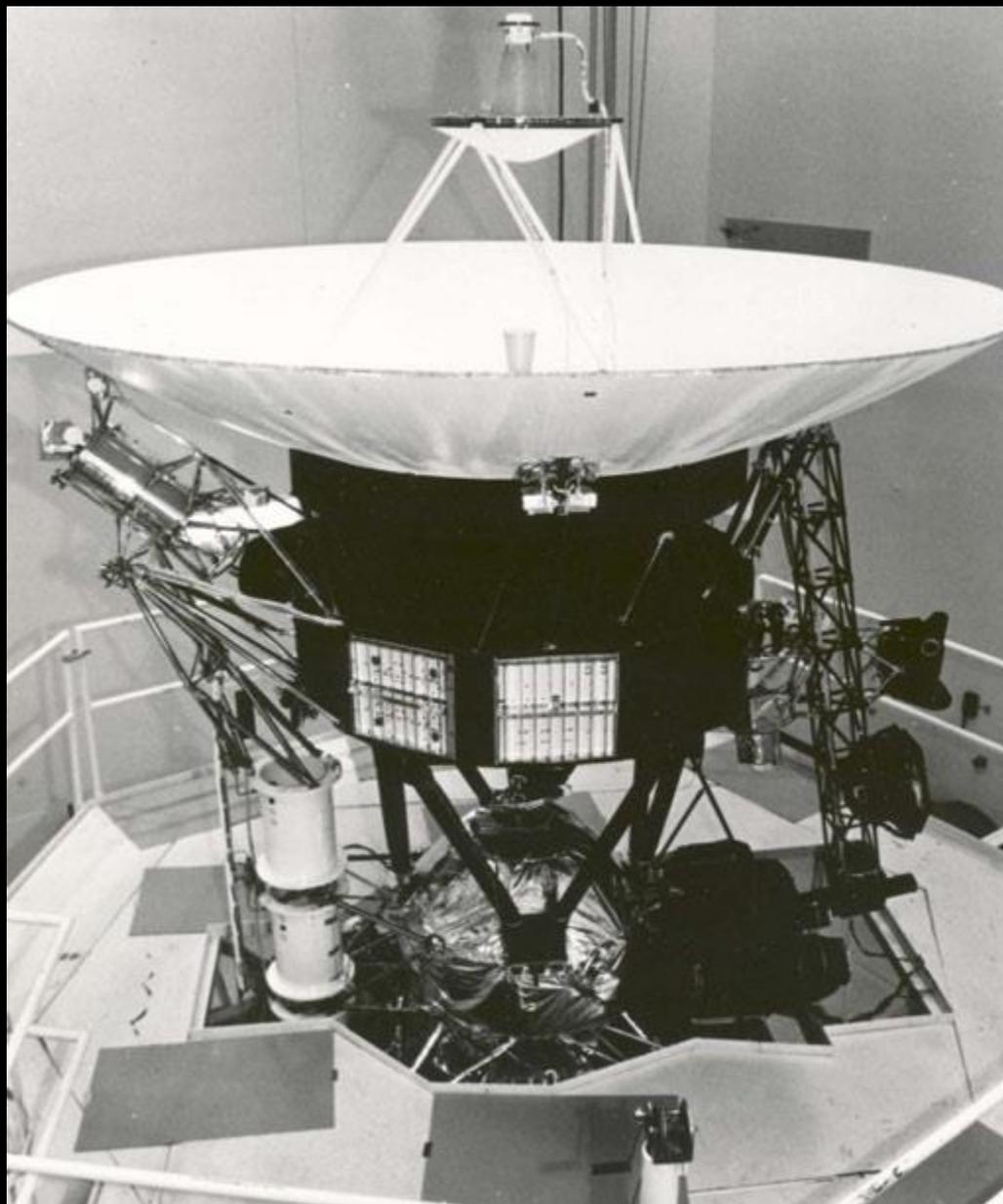


# Mariner Jupiter-Saturn

Stavba na vlastní půdě - JPL NASA.



# 1000x radiace, 10000 scénářů



# *Pásmo S vs. X, JS vs. JSUN*



5. září 1977



3,4 sekundy paliva

18. září 1977

11,66 mil. km

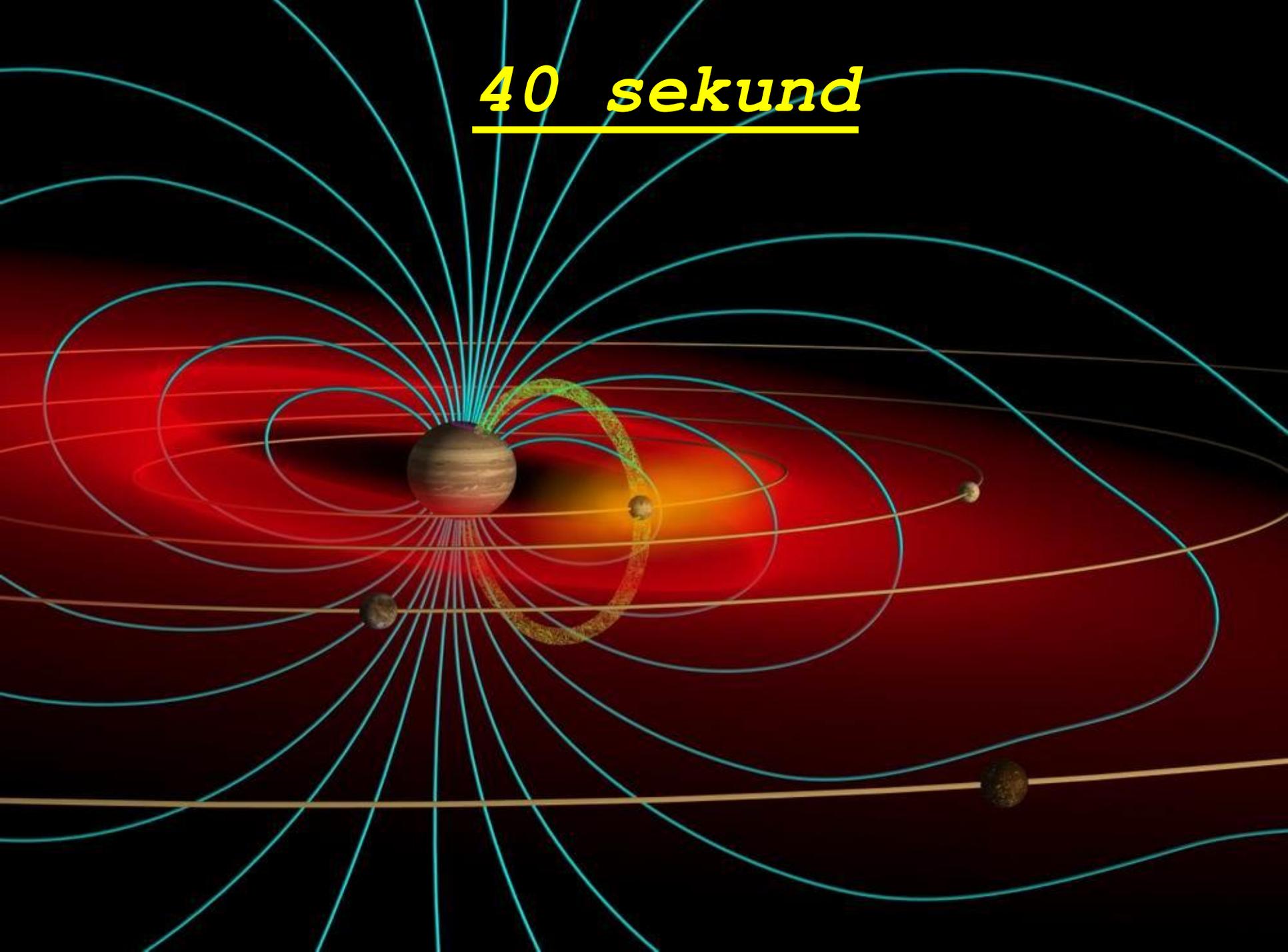


# Rázová vlna



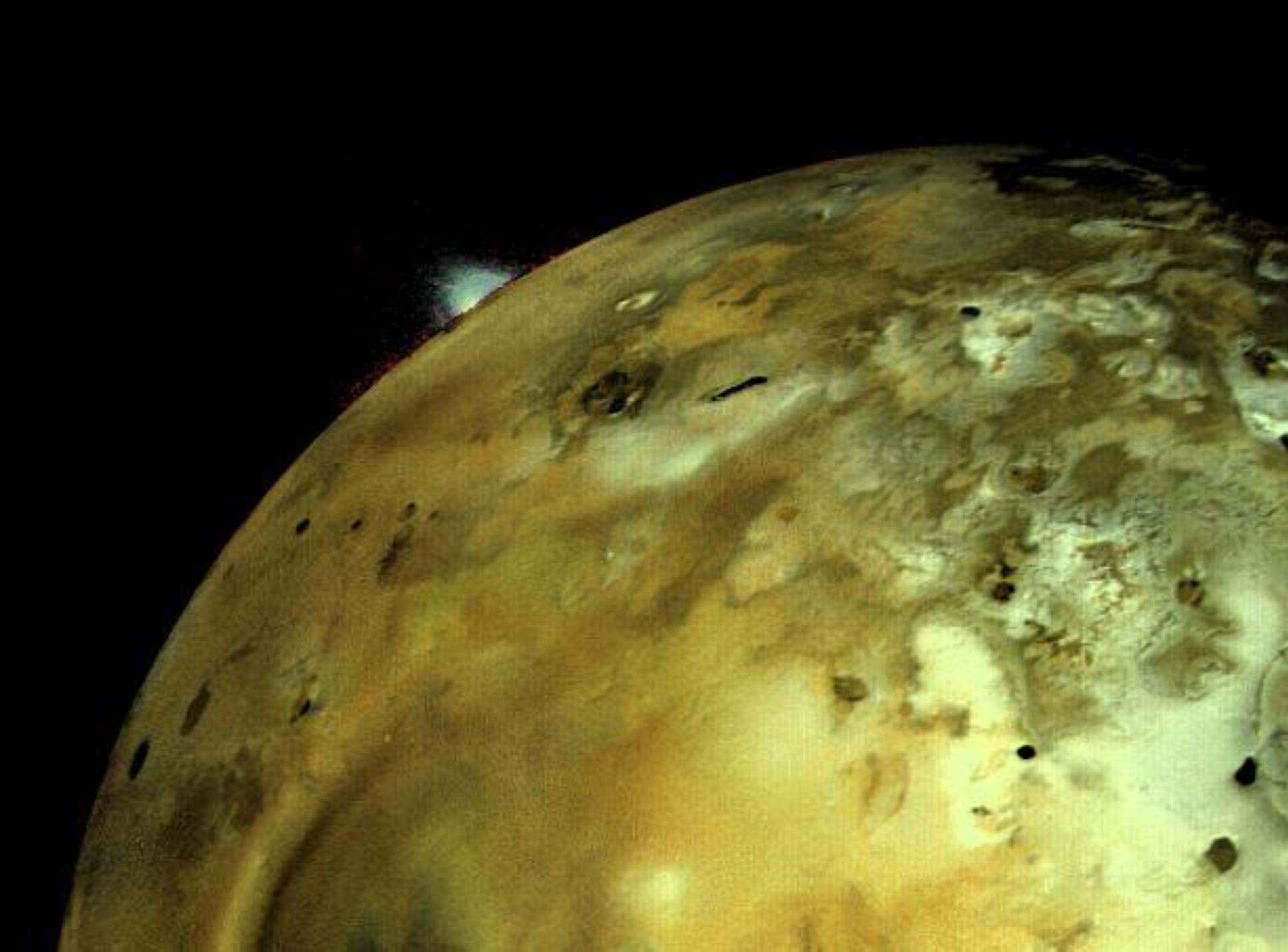


40 sekund



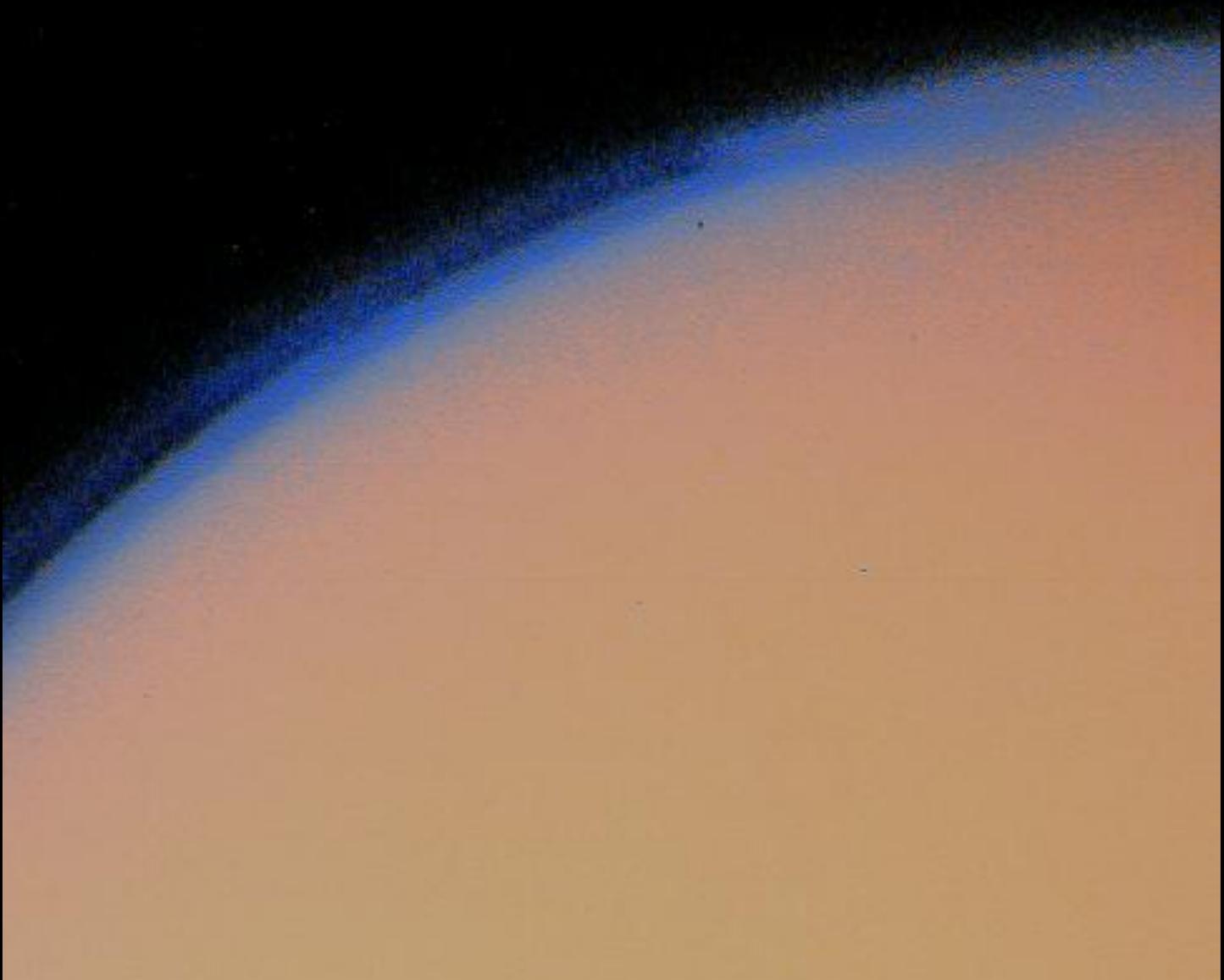
# Největší překvapení







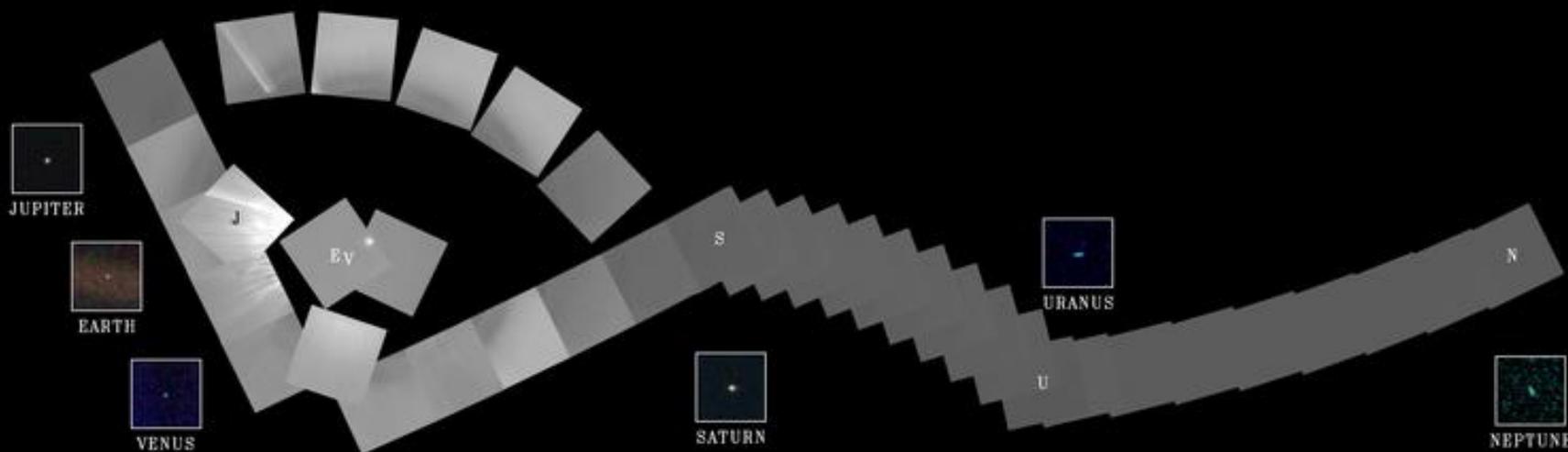
Merkur 2440 km - Titan 2575 km - Mars 3390 km



# Blízke infračervené

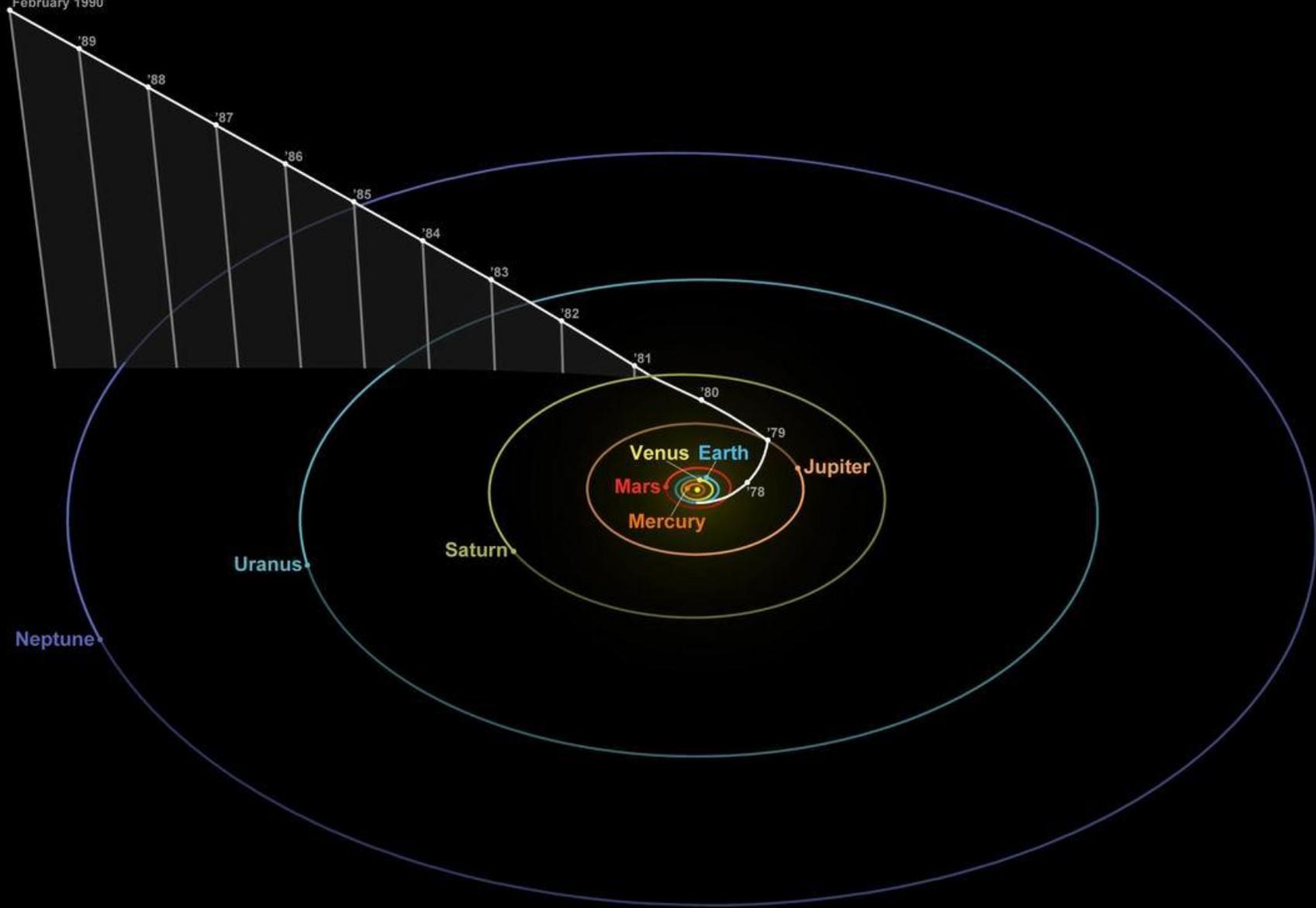


# Rodinný portrét – 14. února 1990



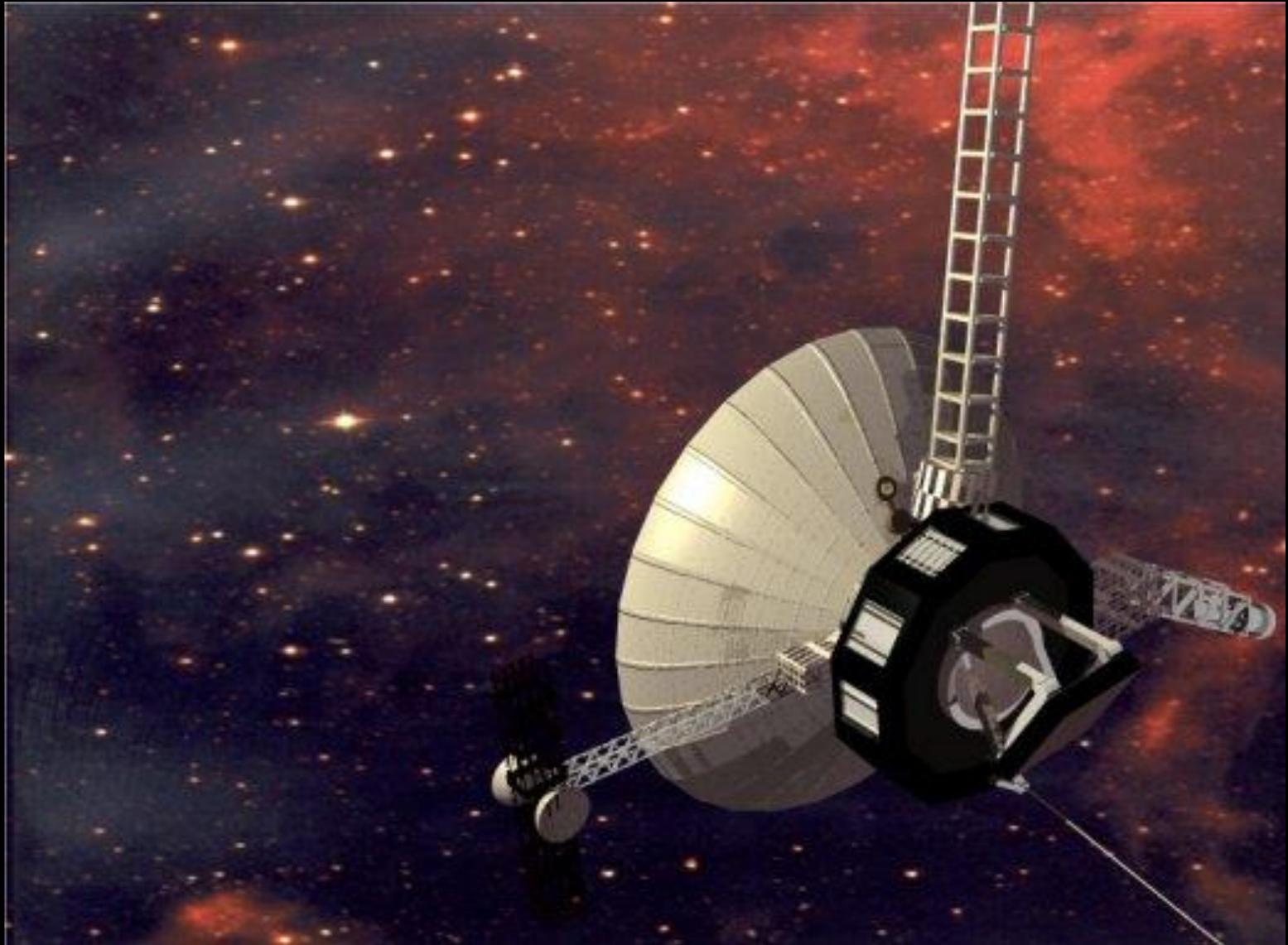
**Merkur, Mars, Pluto**

**Voyager 1**  
February 1990



# Blue Pale Dot

*Srpen 2012*



## Tři podmínky



Dramatický nárůst střetů s vysokoenergetickými částicemi.



Dramatický pokles střetů s nízkoenergetickými částicemi.



Změna tvaru magnetického pole.

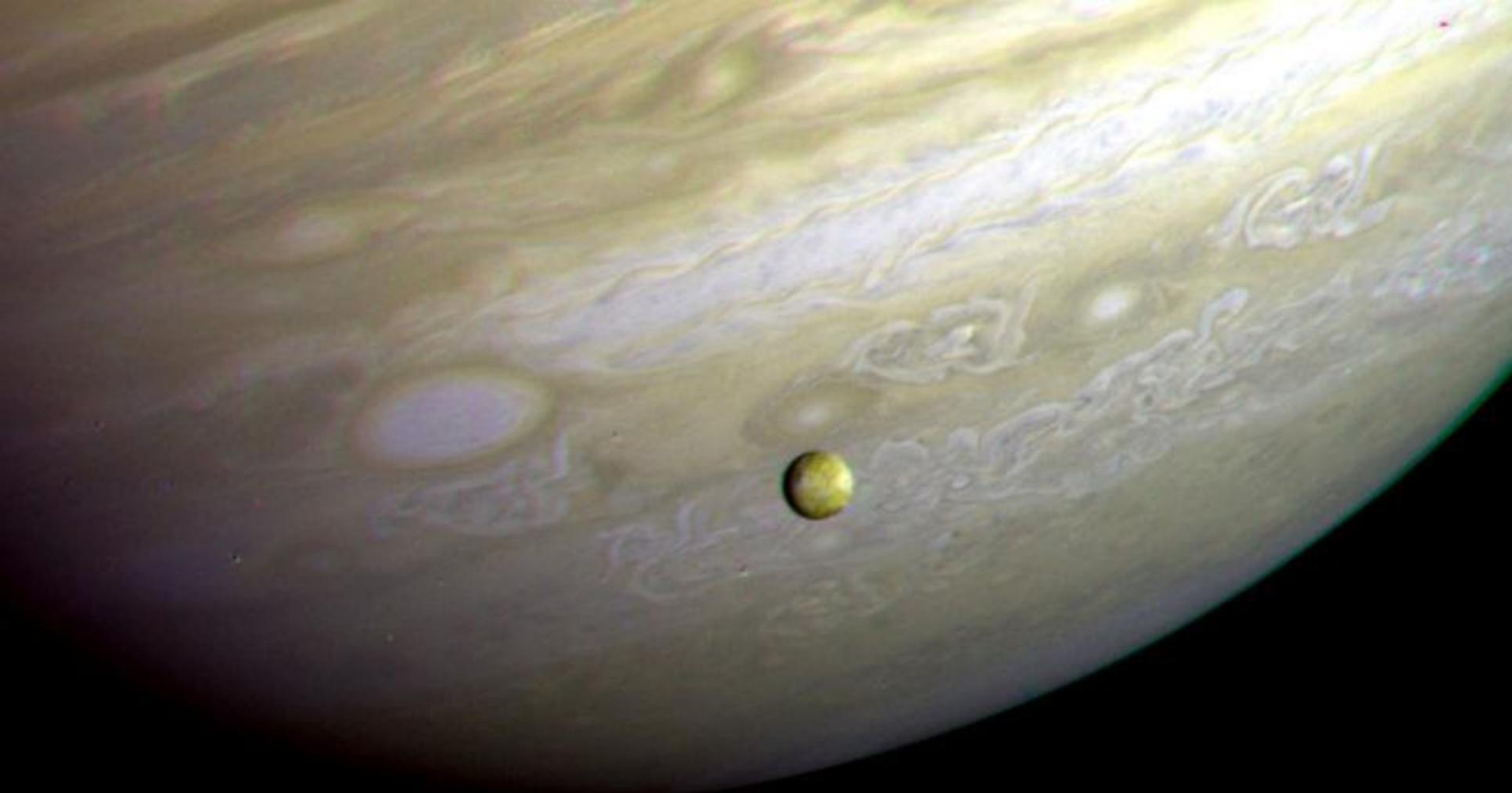
NUMBER OF TIMES  
VOYAGER 1 HAS  
LEFT THE SOLAR SYSTEM

---

### ### ###  
### ||

20. srpna 1977





Škubnutí, signál, přístrojová  
plošina, palivo...



Zaseklá plošina



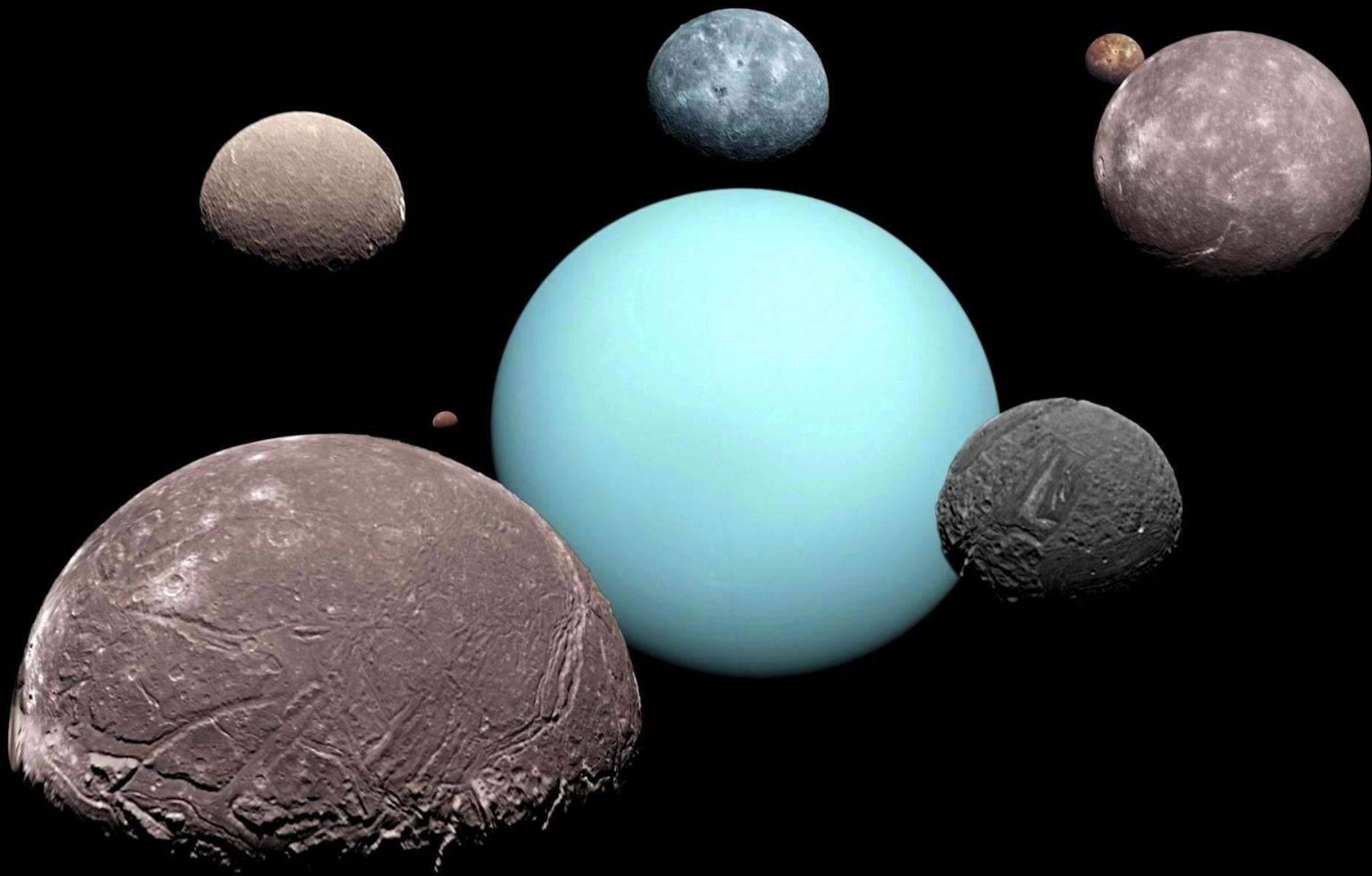
*Omylem objevený Tethis*

24. ledna 1986

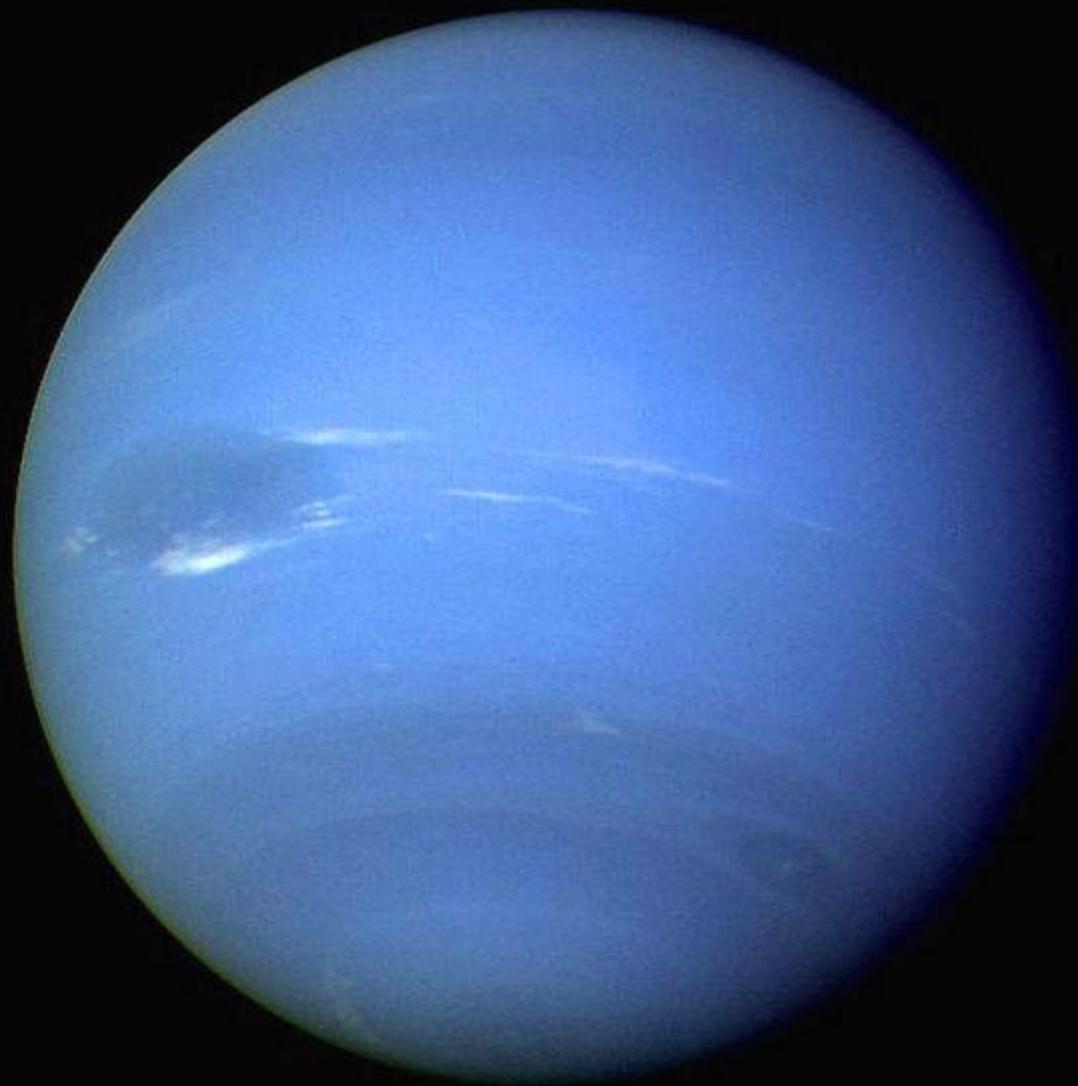




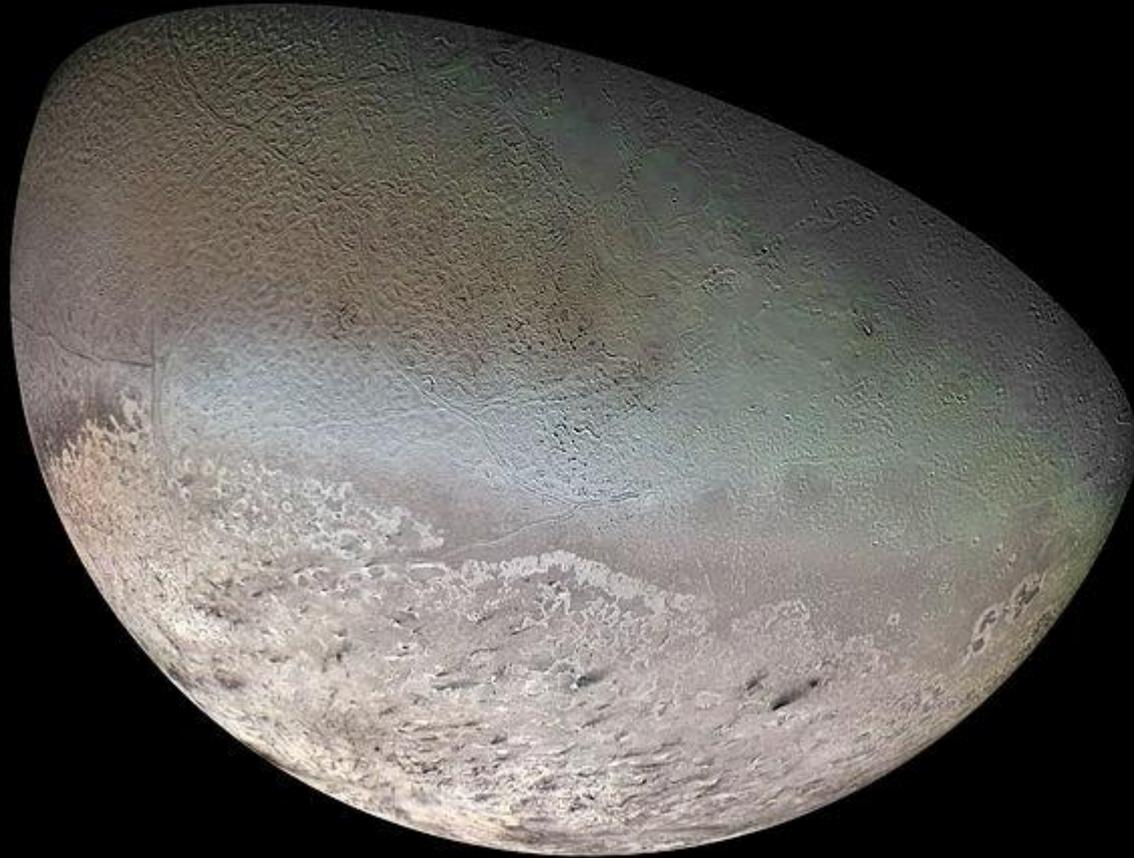




25. srpna 1989

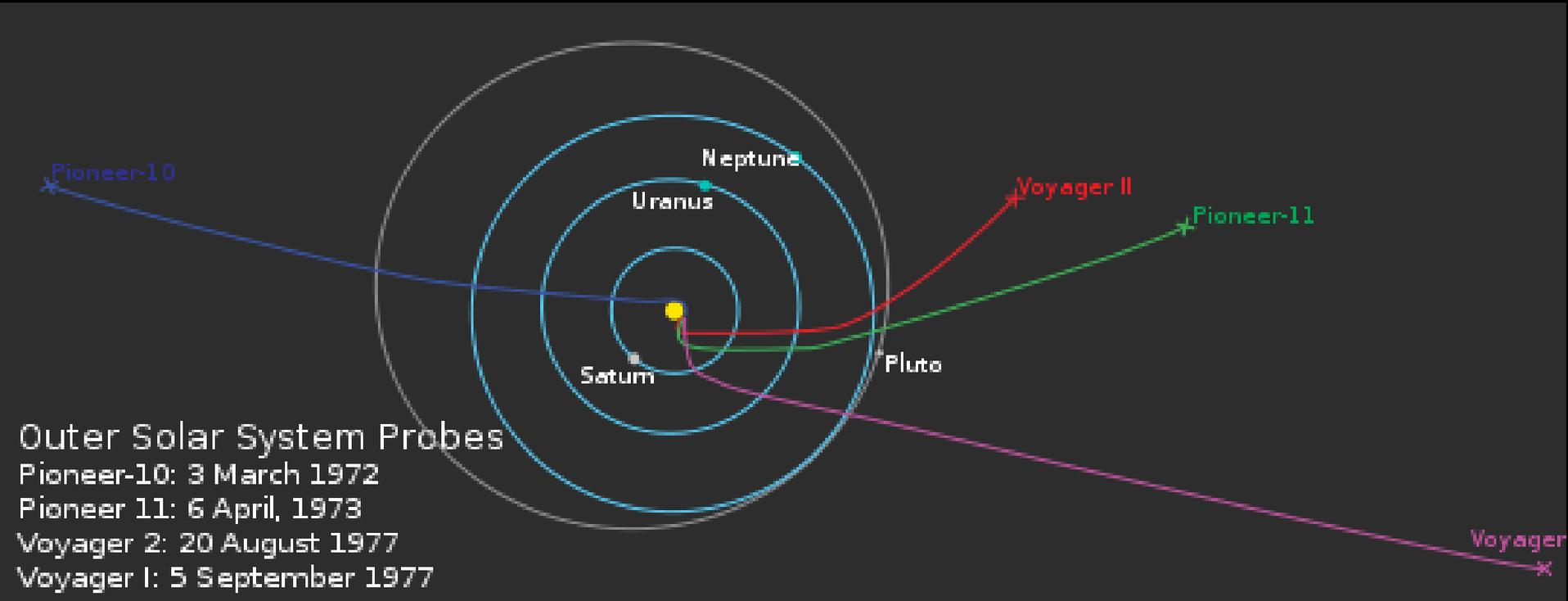


# Triton - největší měsíc?



38 stupňů Kelvina (gejzíry)

***Voyager 1: 142 AU***

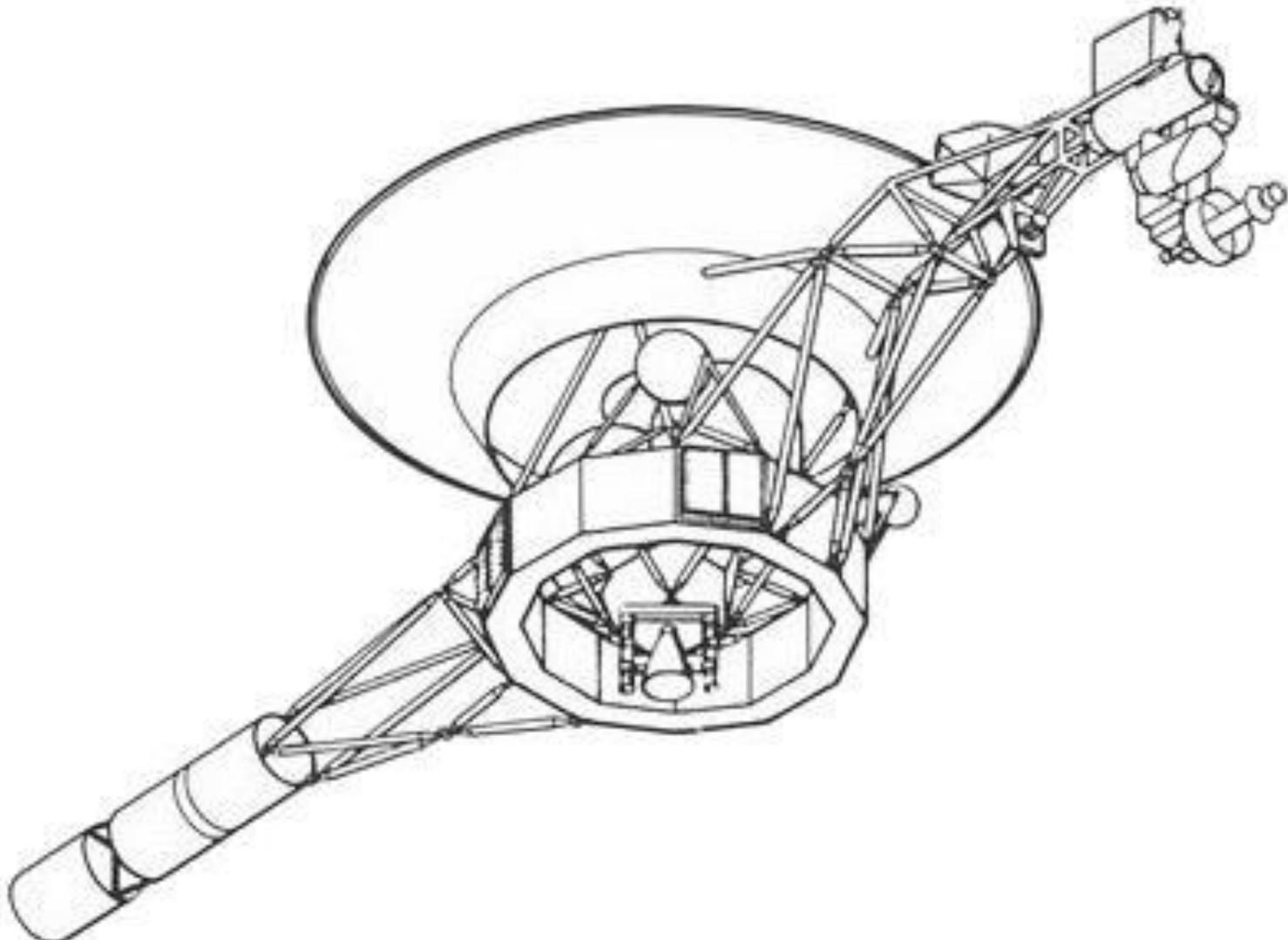


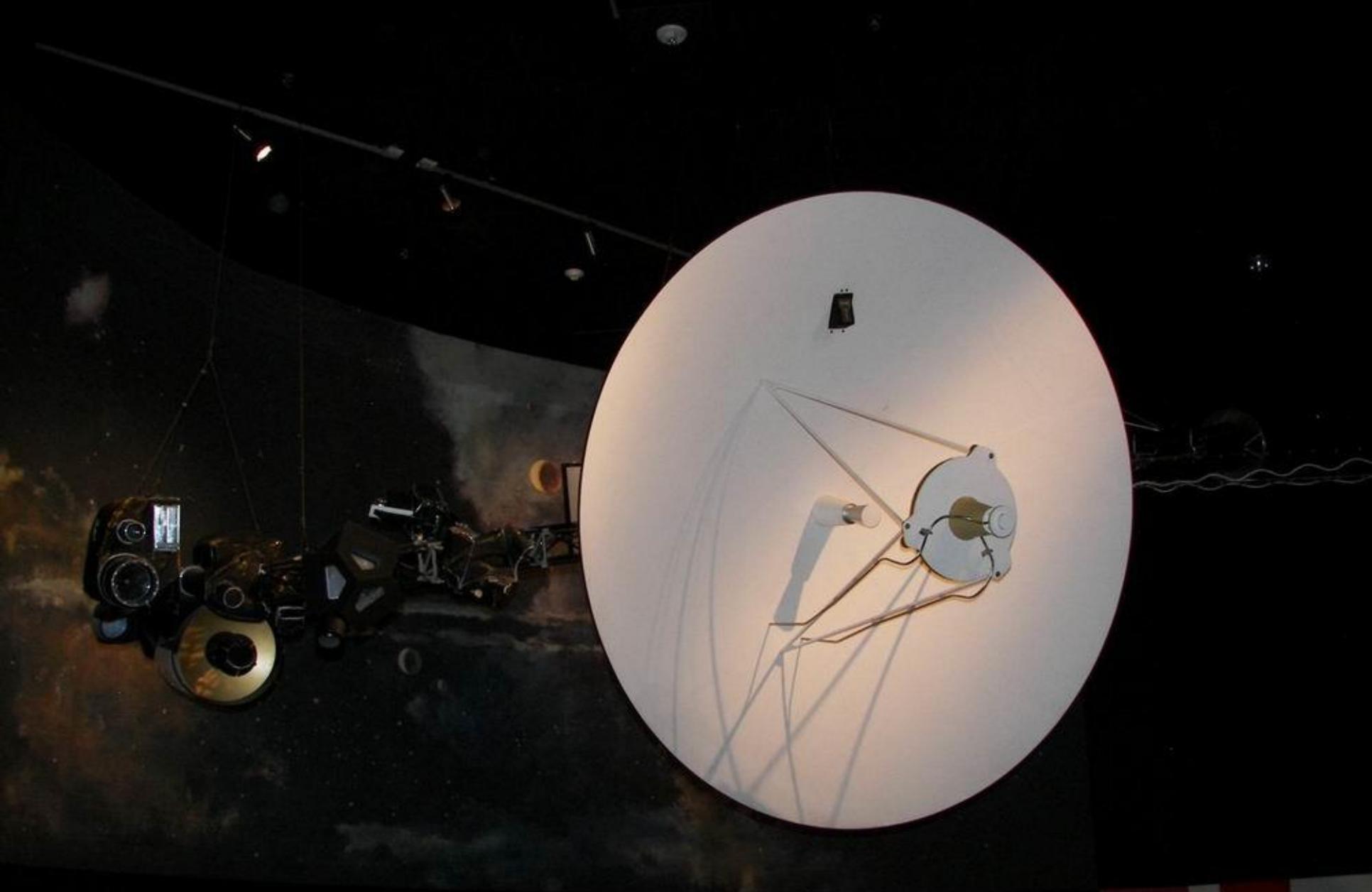
***Voyager 2: 119 AU***

**GALILEO**



# Voyager-3





SOONS  
THE WORLD OF JUPITER  
SOONS  
THE BRIGHTEST WORLD IN  
OUR NIGHT SKY  
RETURN  
THE WORLD OF JUPITER  
RINGS  
THE WORLD OF JUPITER  
SOONS  
GER  
JUPITER  
A PLANET FOR THE AGE  
TUNE  
EXPLO

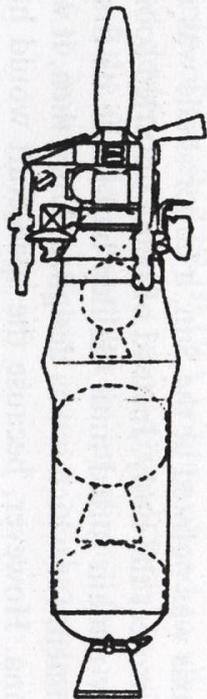
# Galileo



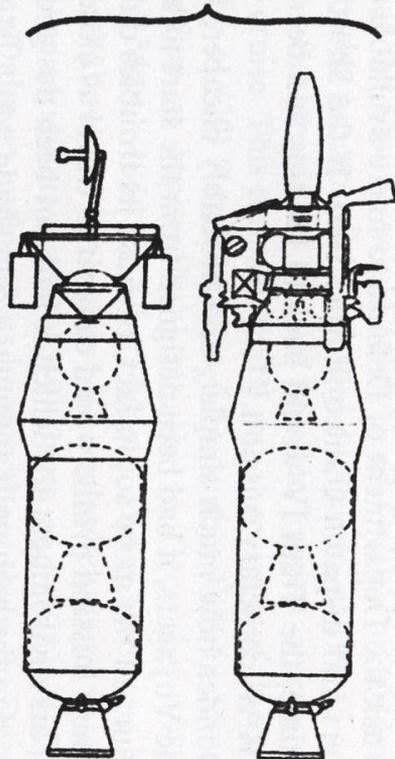




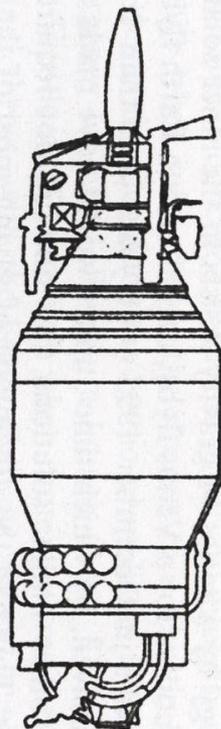
JANUARY '82  
3 STAGE IUS



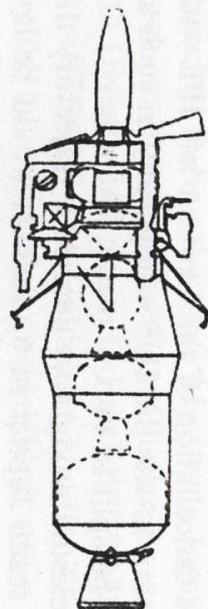
FEB/MAR '84  
3 STAGE IUS



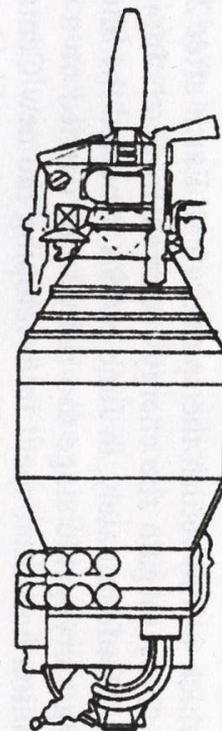
APRIL '85  
CENTAUR



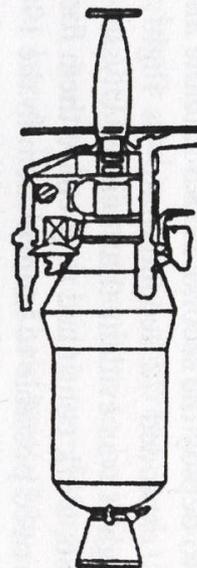
MAY '85  
2 STAGE IUS



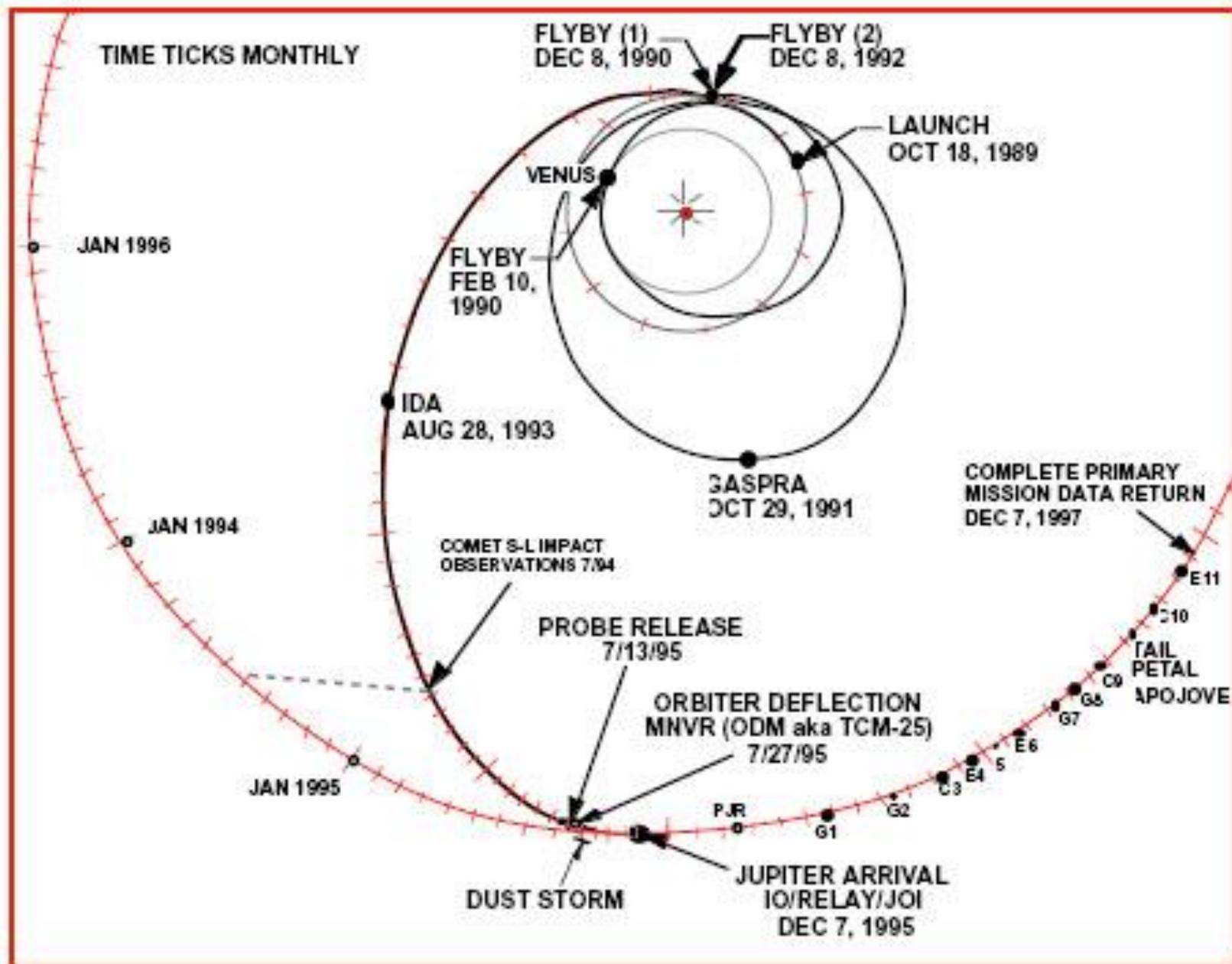
MAY '86  
CENTAUR



OCTOBER '89  
2 STAGE IUS





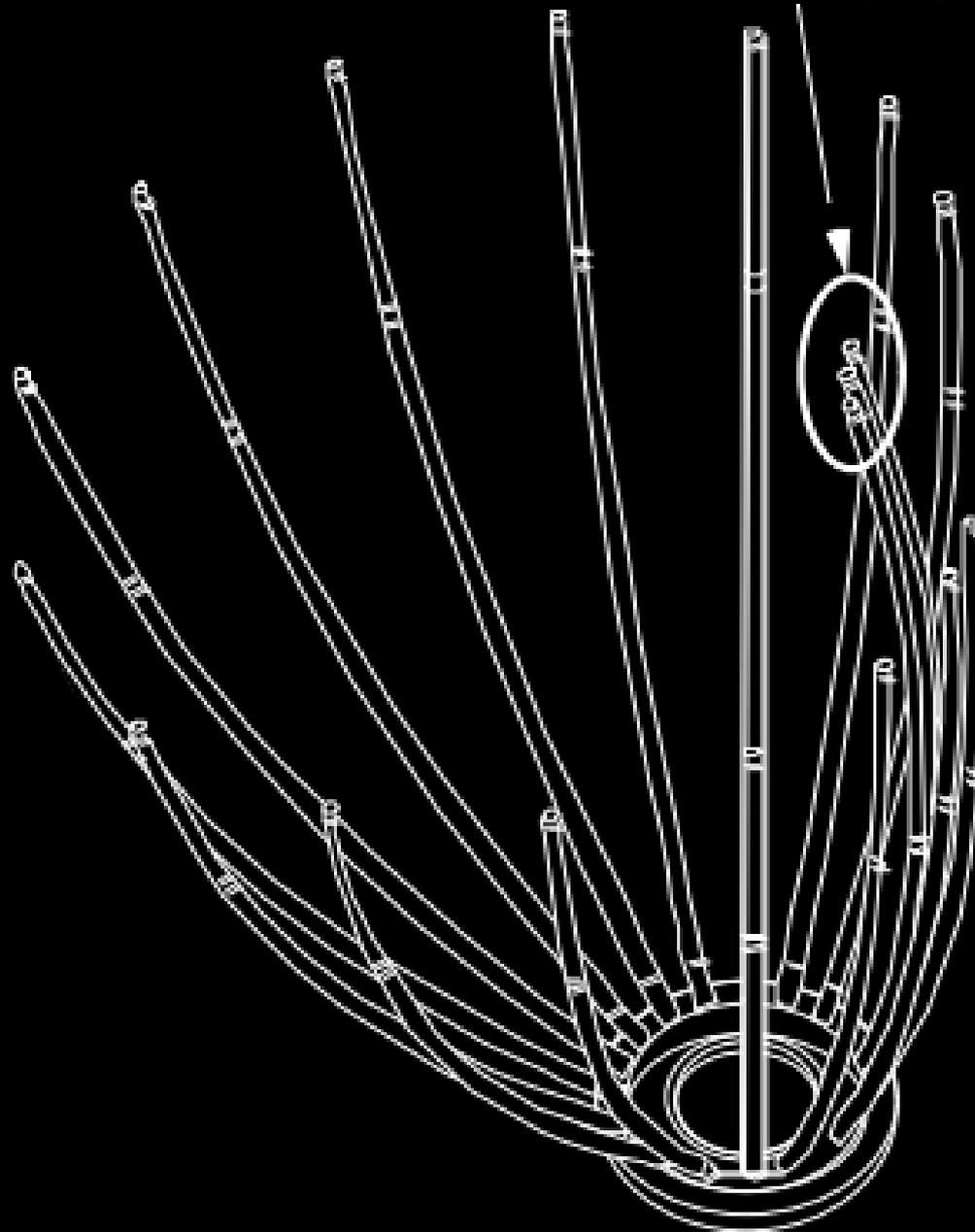




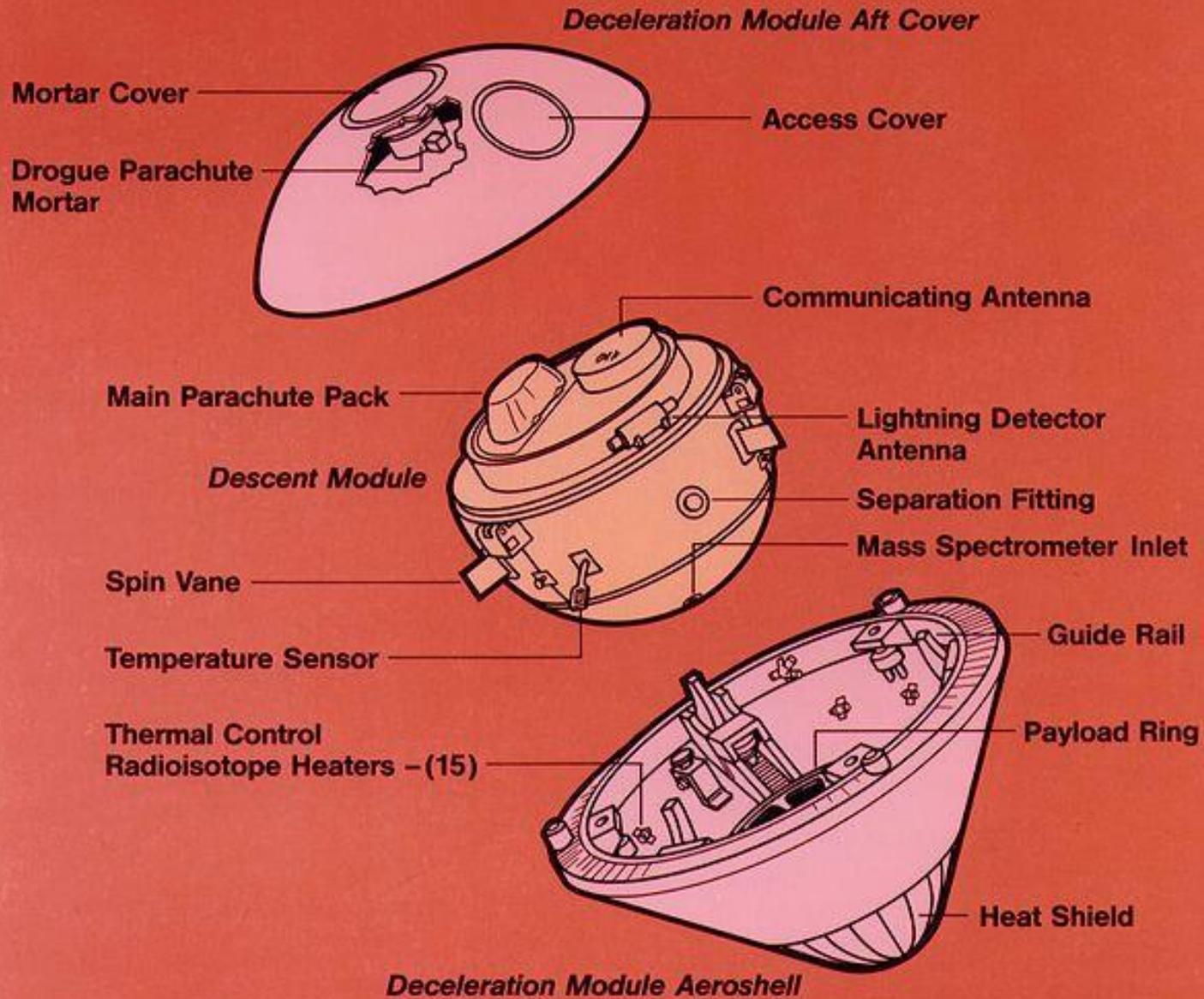




STOWED  
RIBS 9, 10, 11



# PROBE





Září 2003

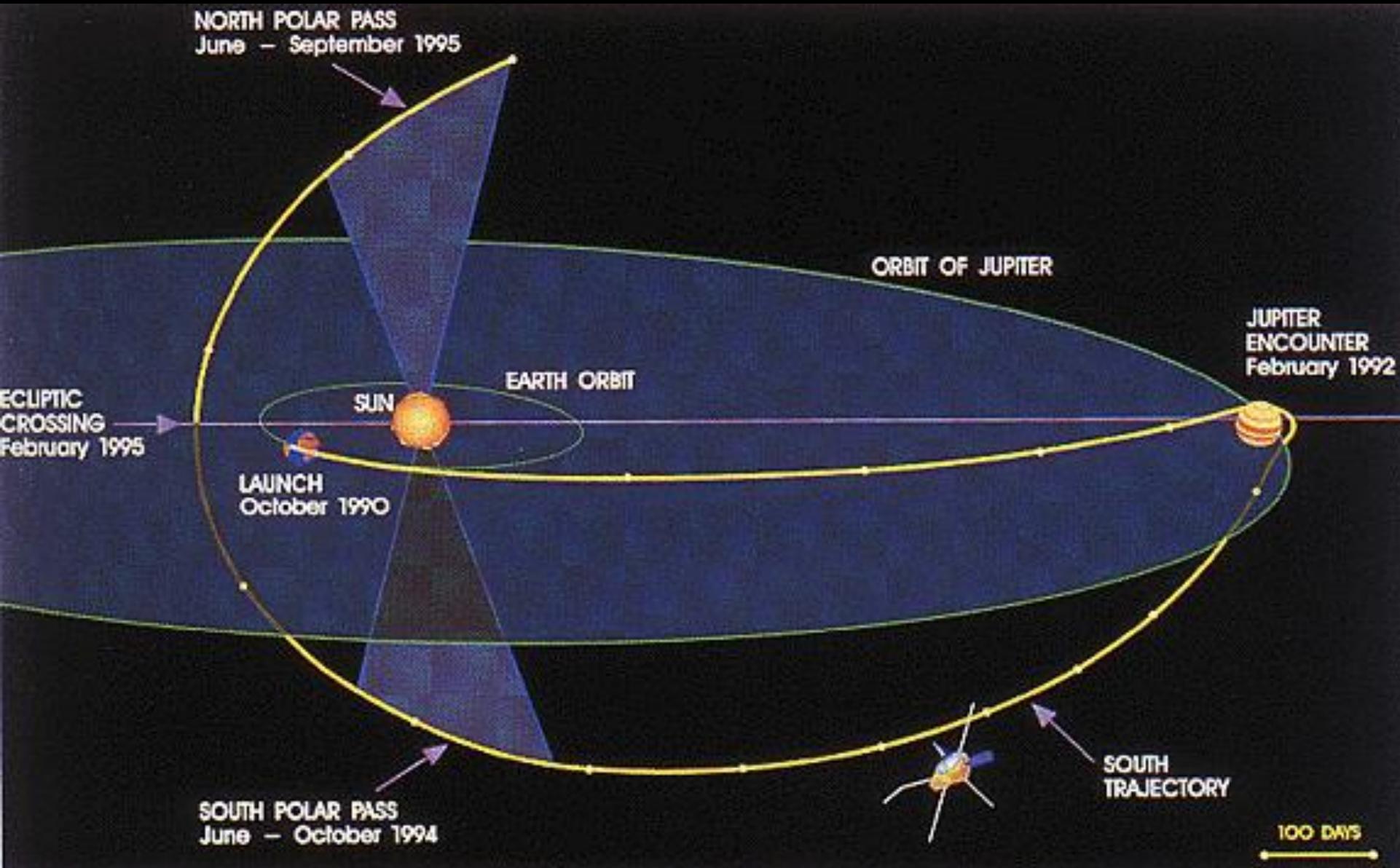


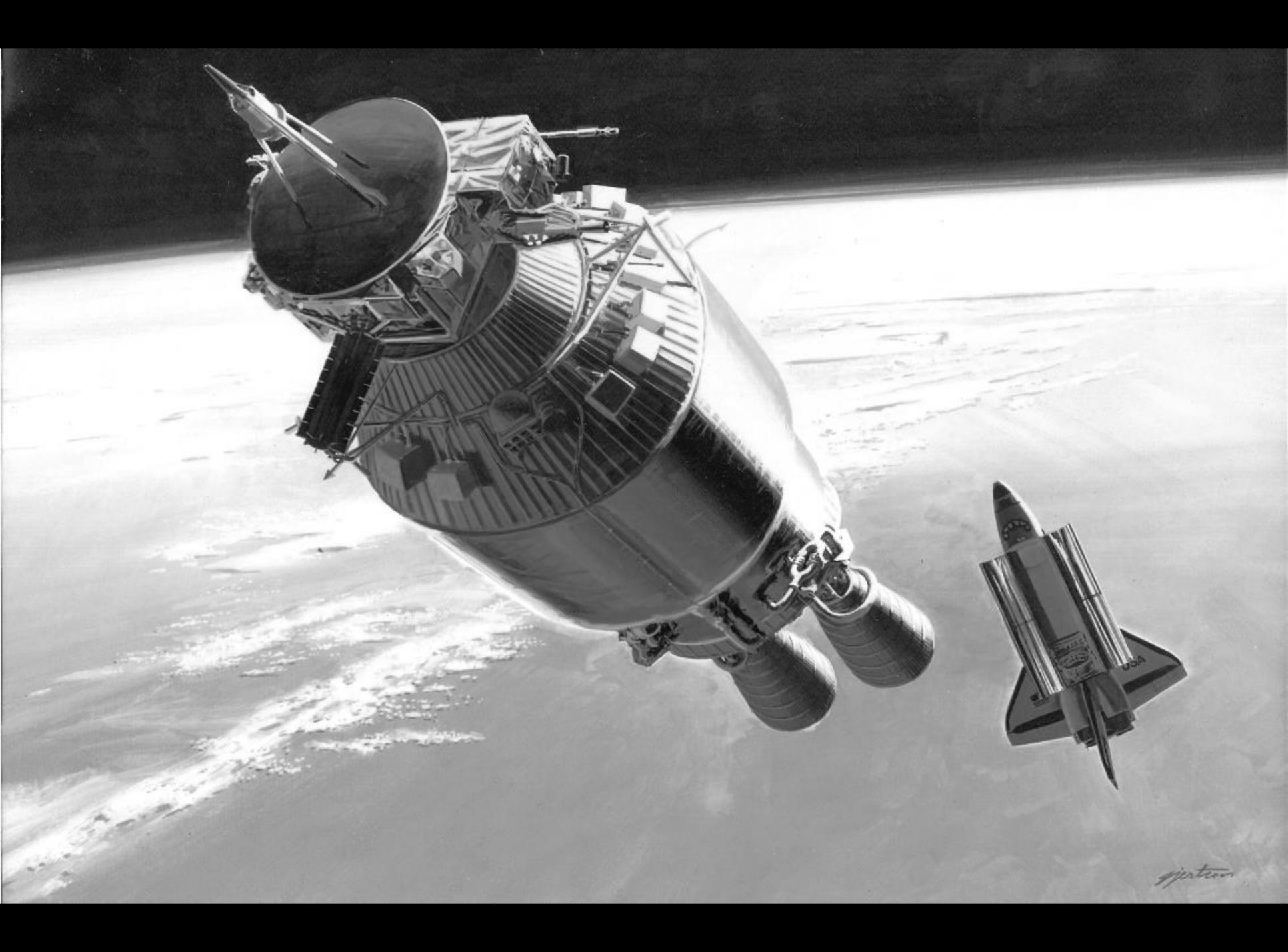
**ULYSSES**



# Odysseus







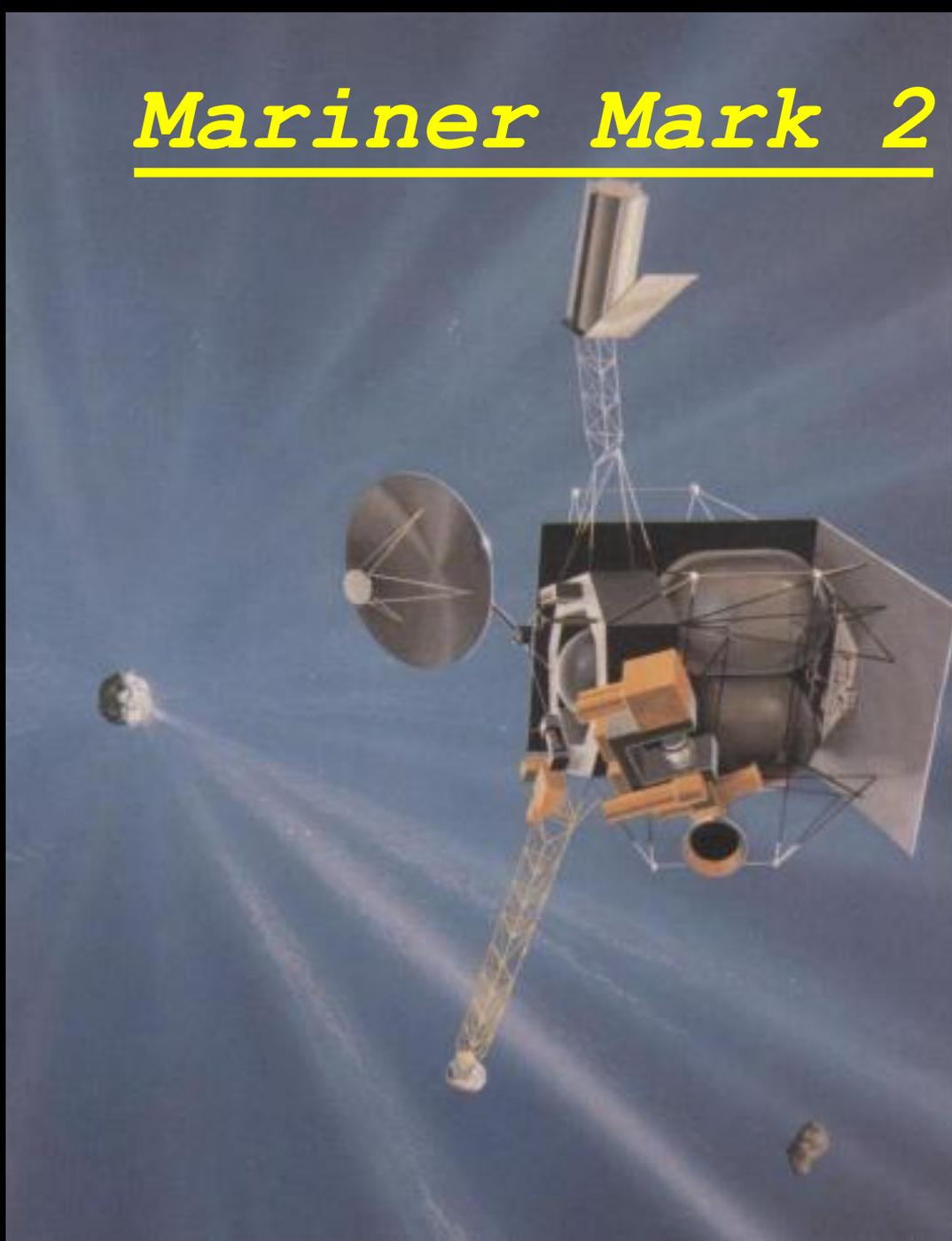
Říjen 1990



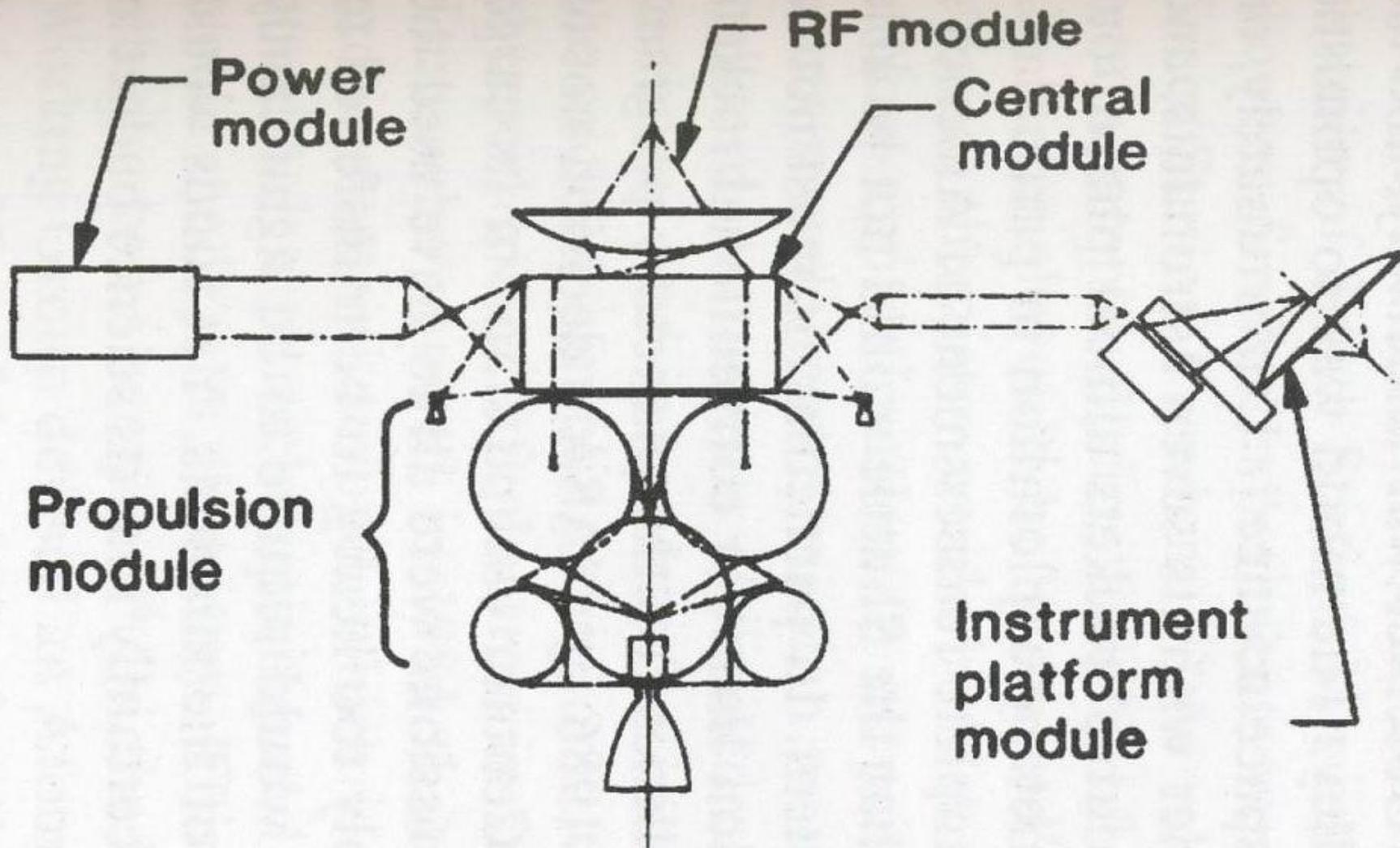
**CASSINI**



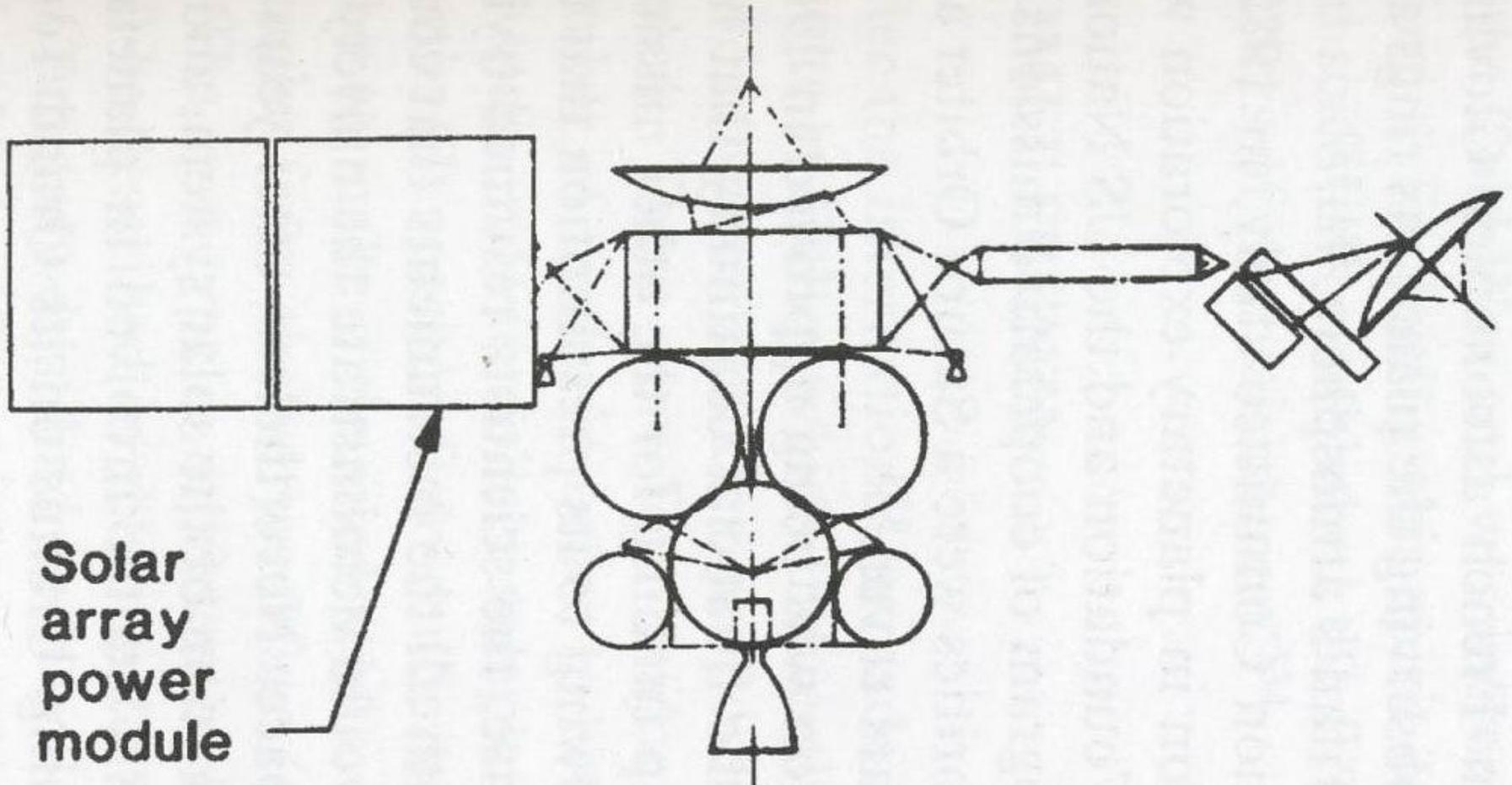
# Mariner Mark 2



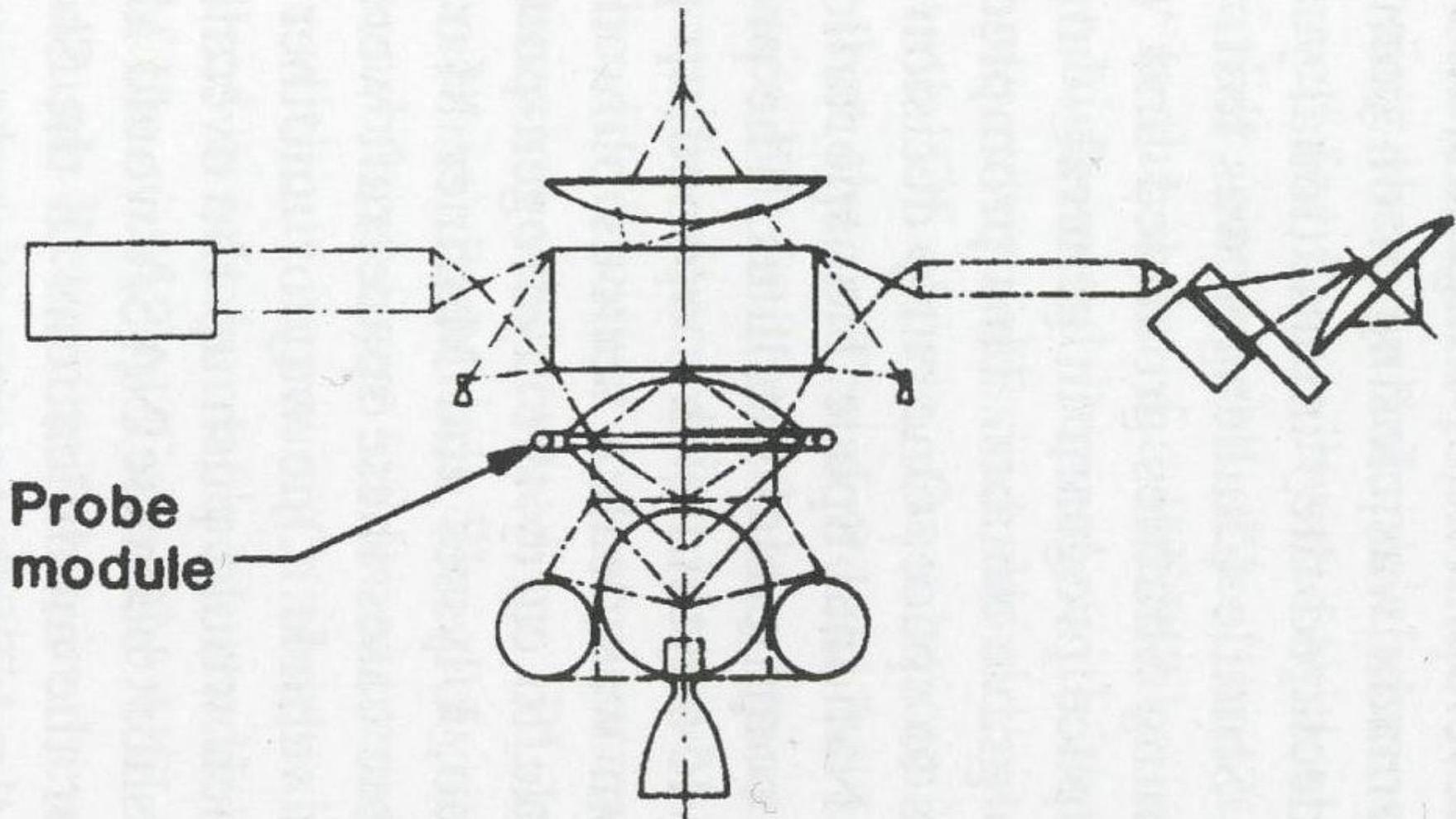
# Orbitální průzkumník



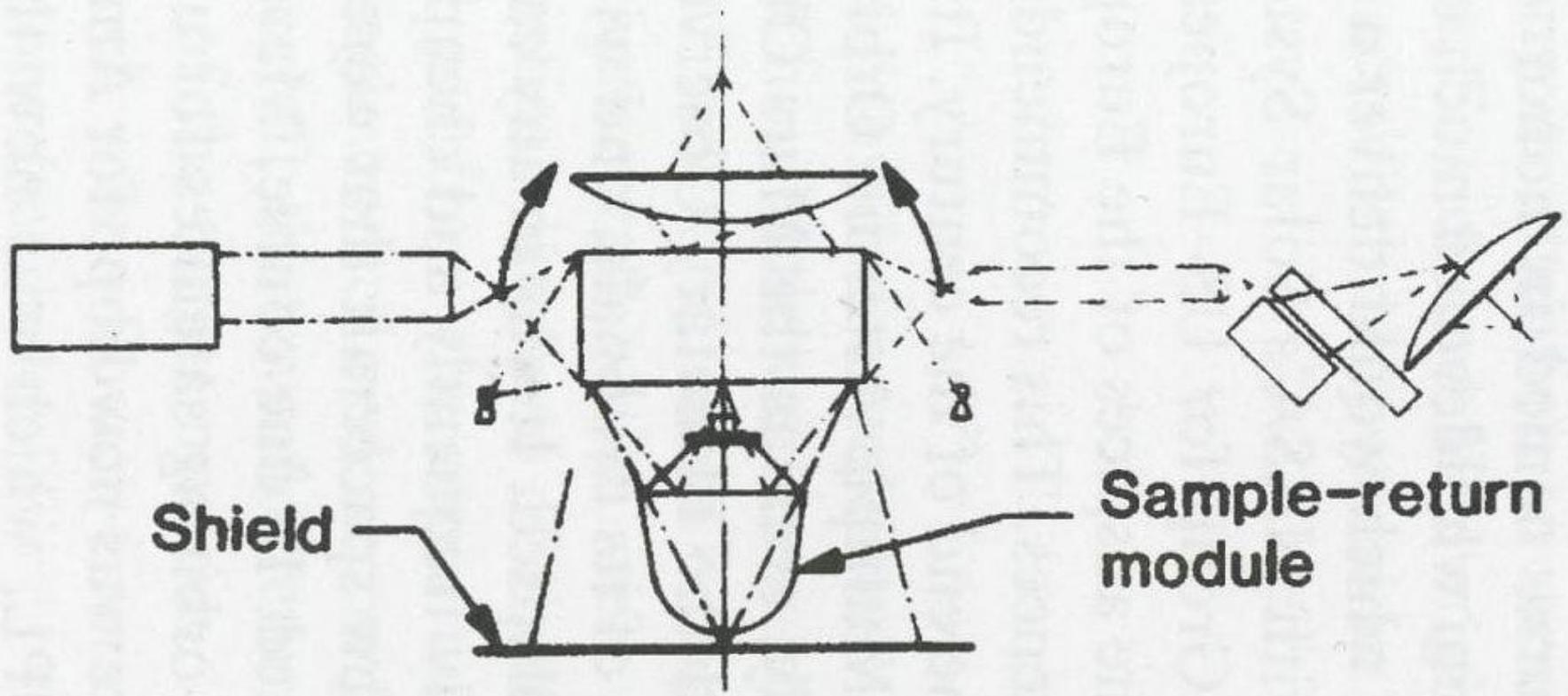
# Sonda se slunečními bateriemi



# Průletová sonda s výsadkovým modulem

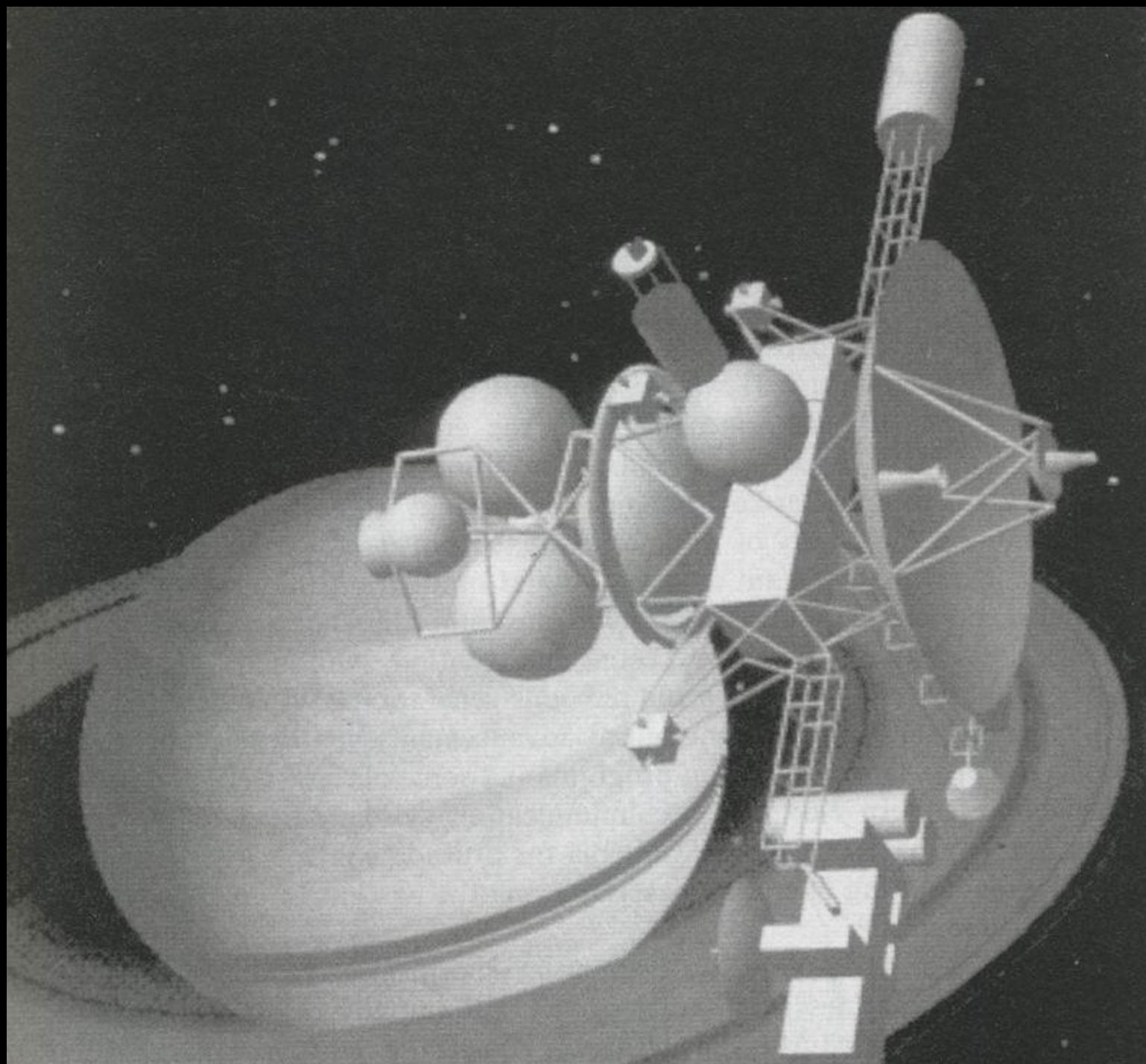


# Odběr vzorků



# Comet Rendezvous/Asteroid Flyby Saturn Orbiter and Titan Probe

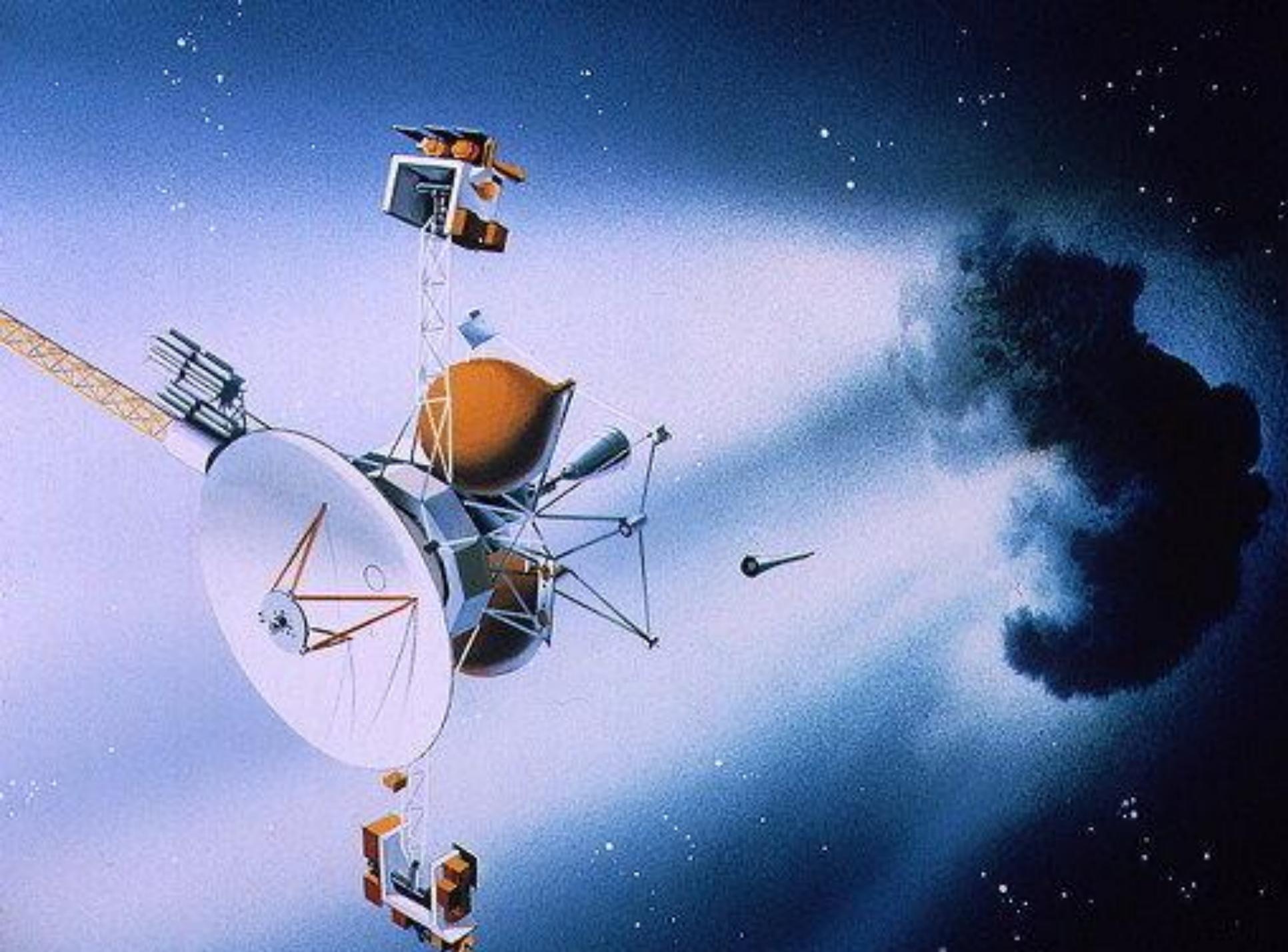


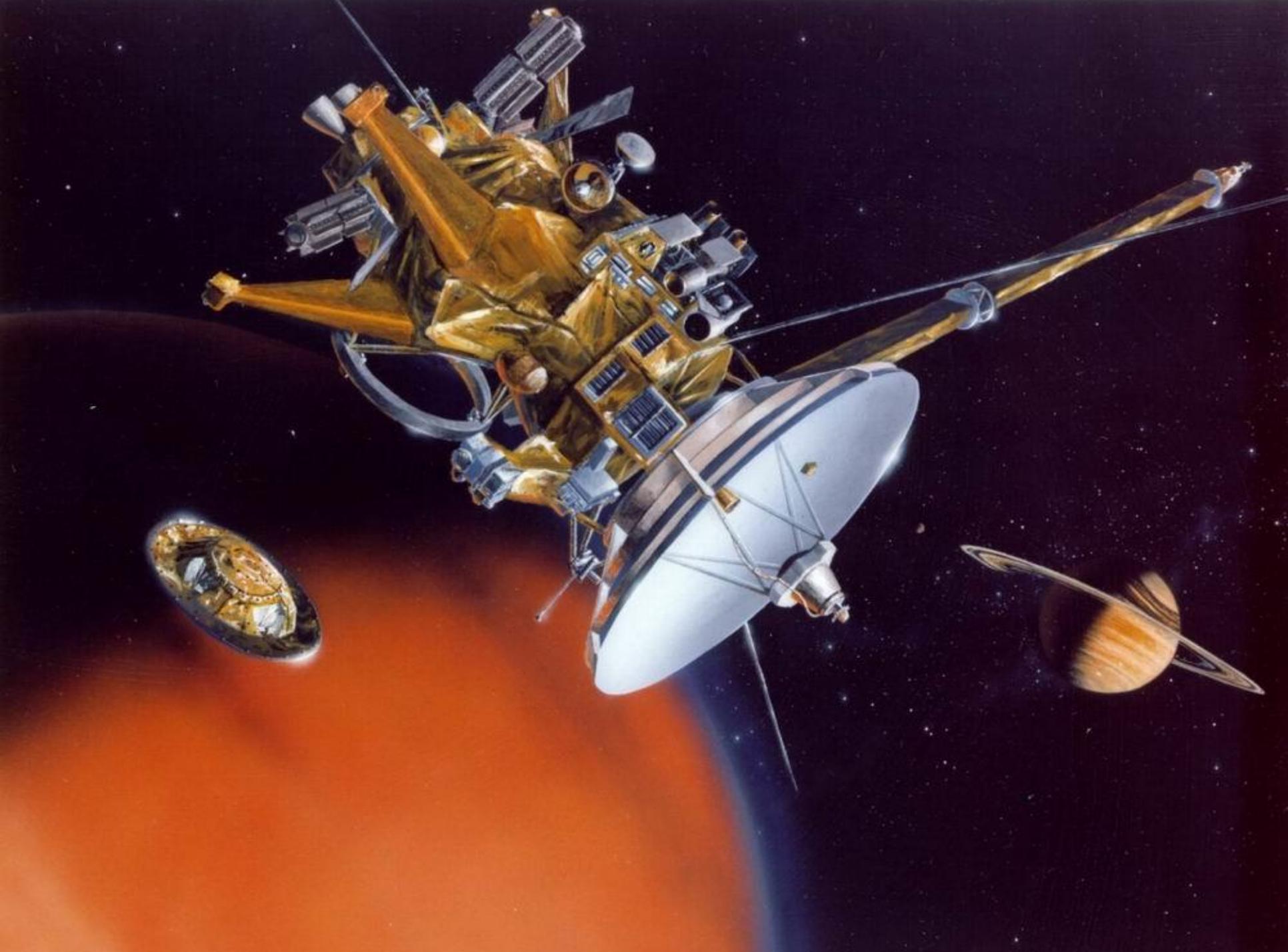


1990 start

Asteroid 772 Tanete, kometa Kopff

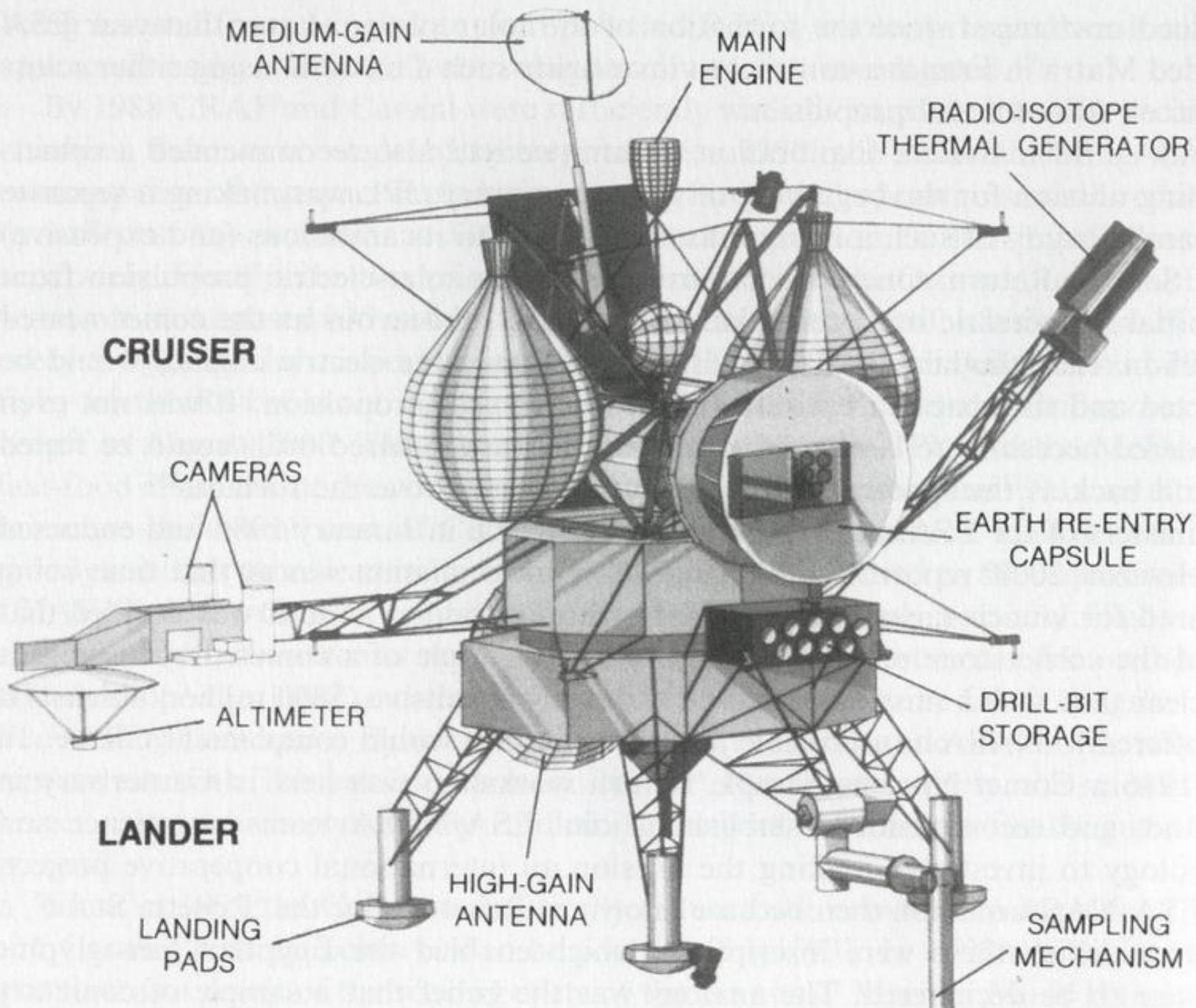






# Comet Nucleus Sample Return





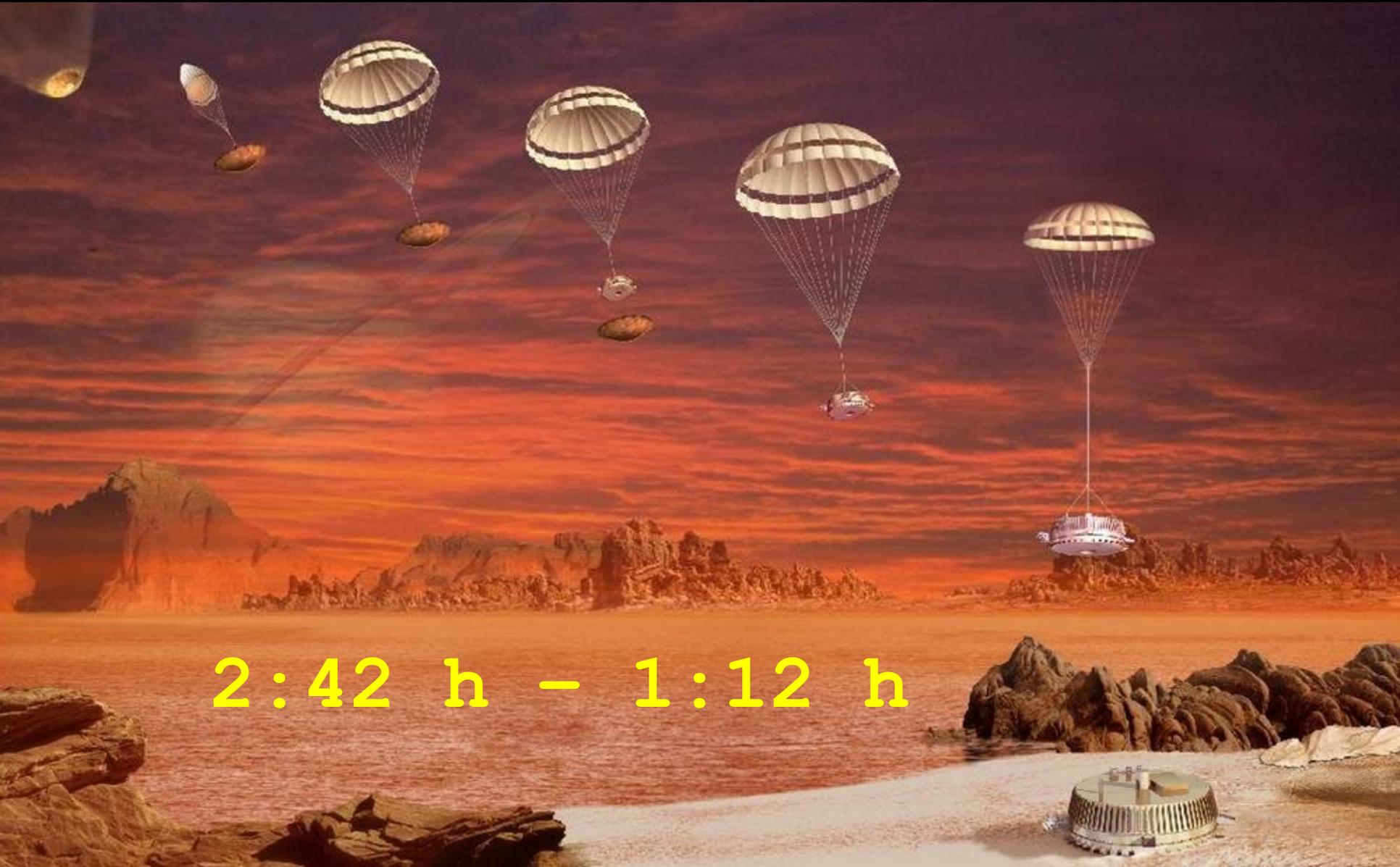
# Cassini

The image shows the Cassini spacecraft in orbit around Saturn. The spacecraft is a complex of gold-colored instruments and a large white dish antenna. It is positioned in the center of the frame, with Saturn's rings and a portion of the planet's orange-brown surface visible in the background. The background is a deep blue space filled with numerous small, bright stars. A thin white line, likely representing a communication or data link, extends from the top of the frame towards the spacecraft.

5632 kg

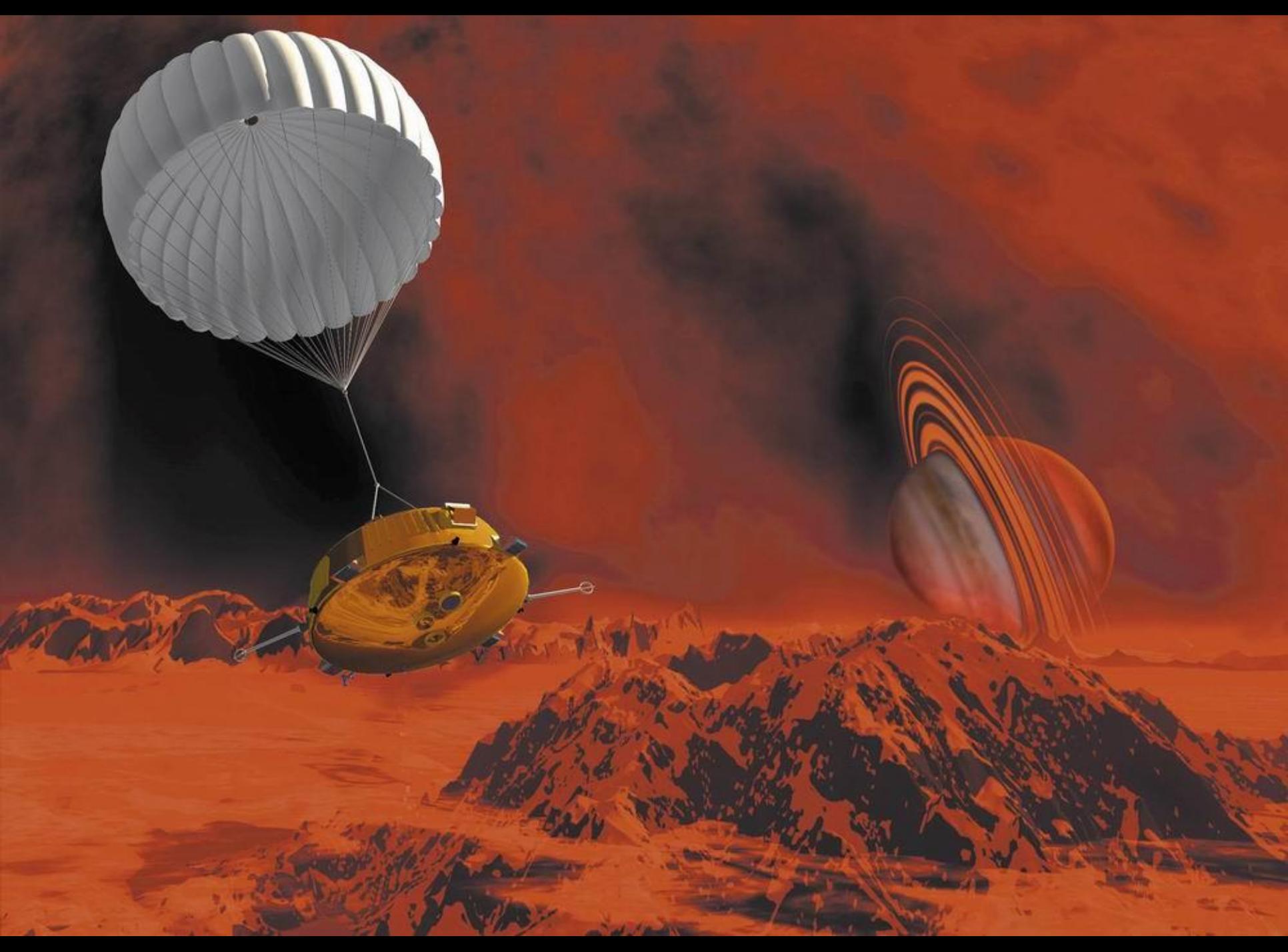
1630 prvků, 22 tisíc drátů 14 km

# Huygens [hearens]



2:42 h - 1:12 h

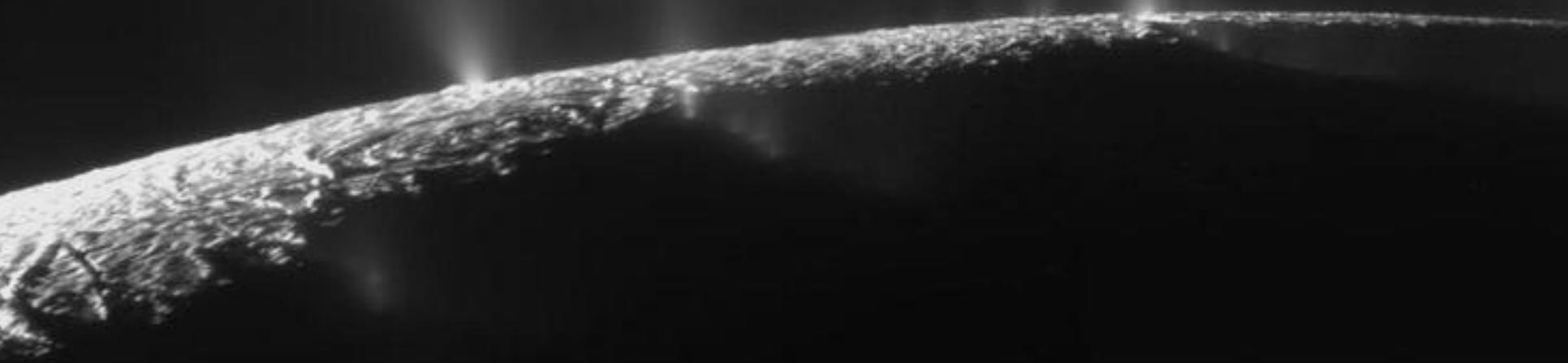




Řeky, jezera, déšť, duhy...



19 vs. 62 měsíců





Září 2017



**NEW HORIZONS**

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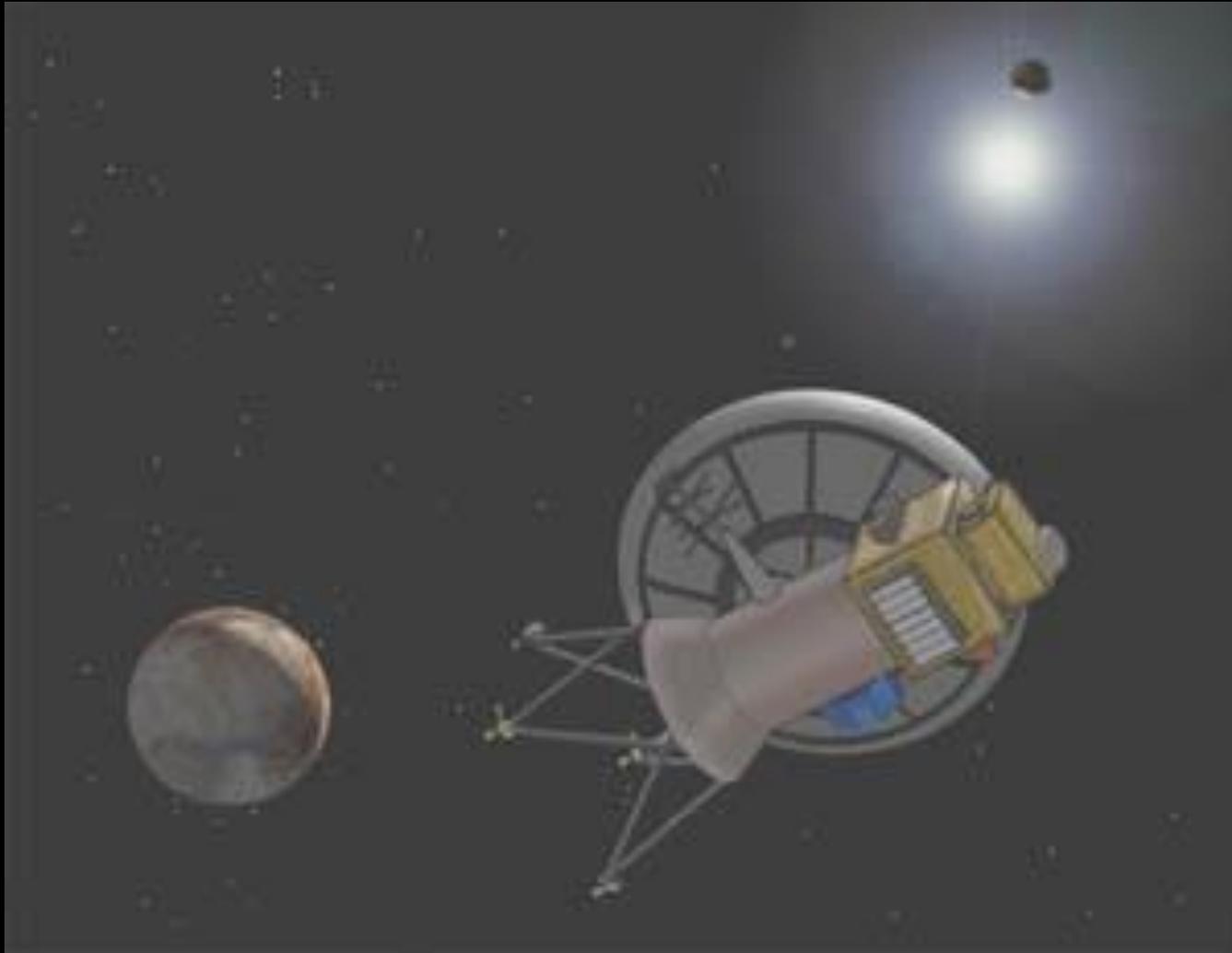
1967: raketa Starlet, sonda  
Starlite (11 kg).

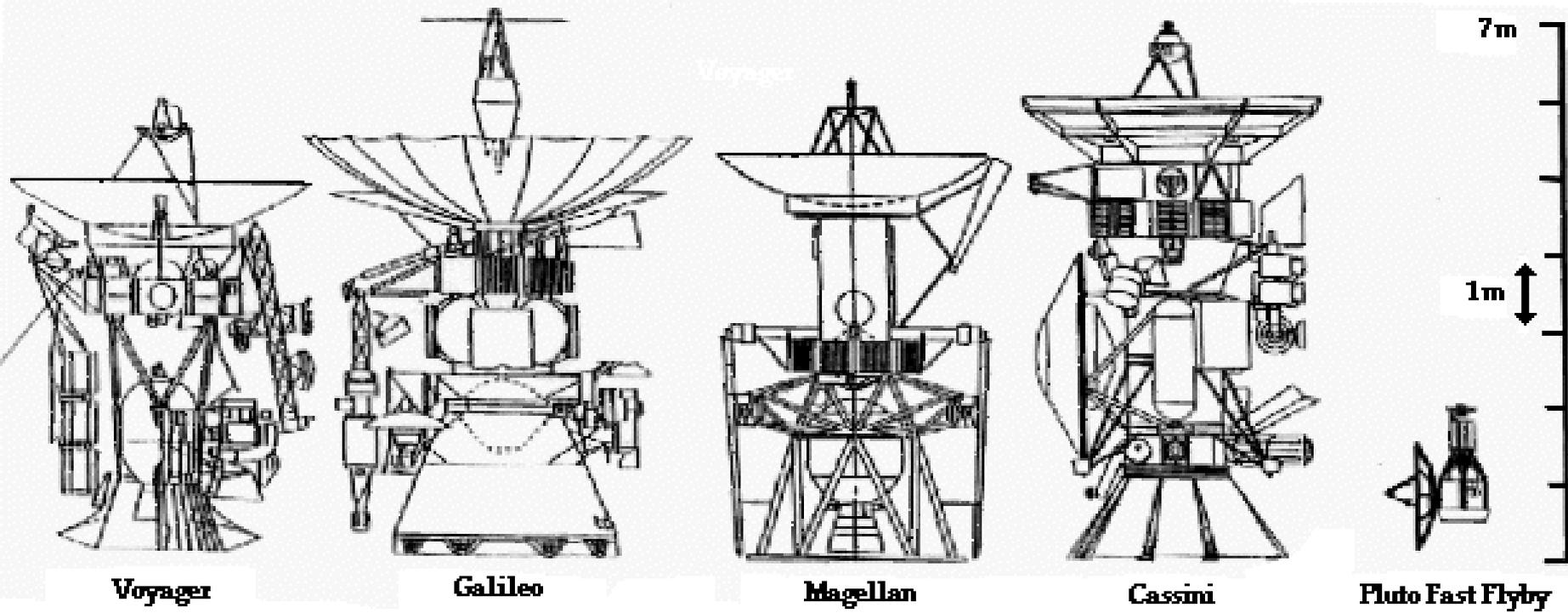
1989: Pluto-350 (Delta-II,  
malá subsonda).



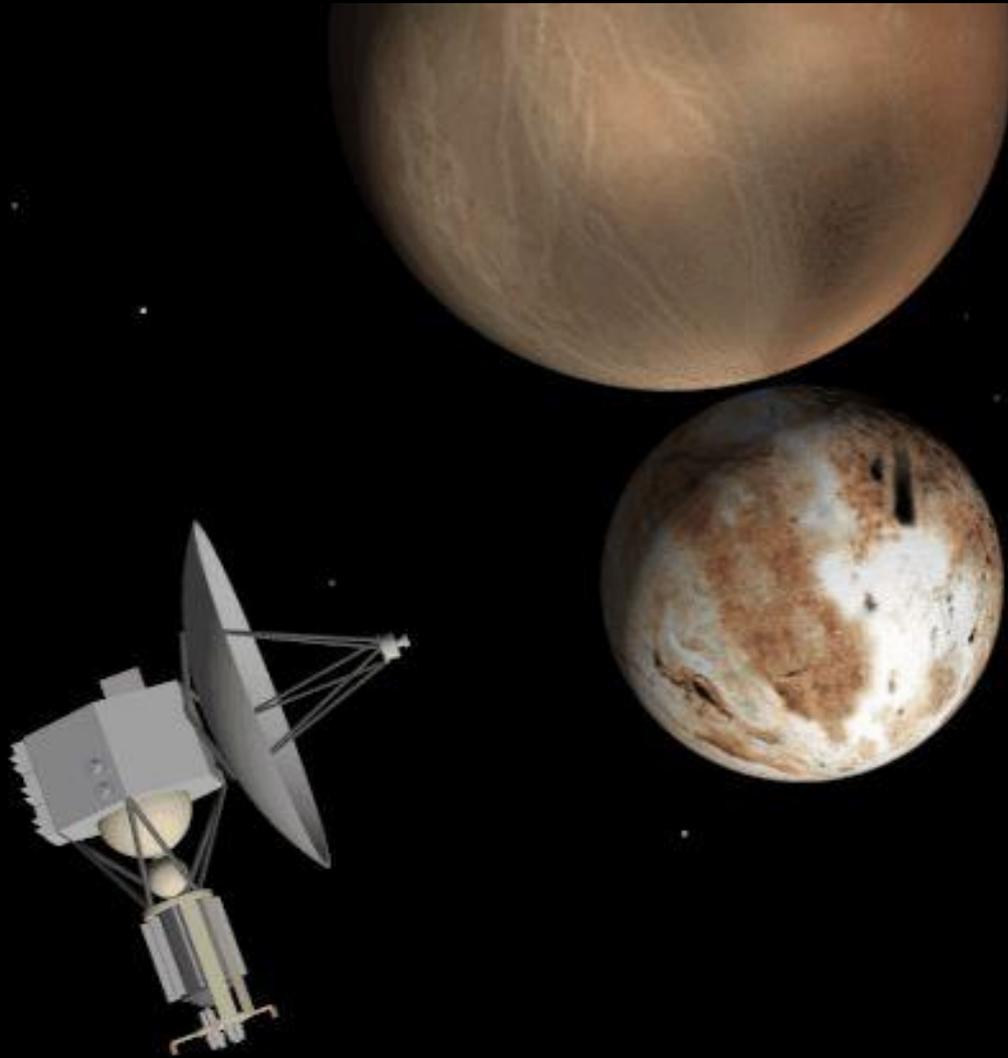
# Pluto Fast Flyby (1992)

Chemické baterie (!), Titan IV/ Proton





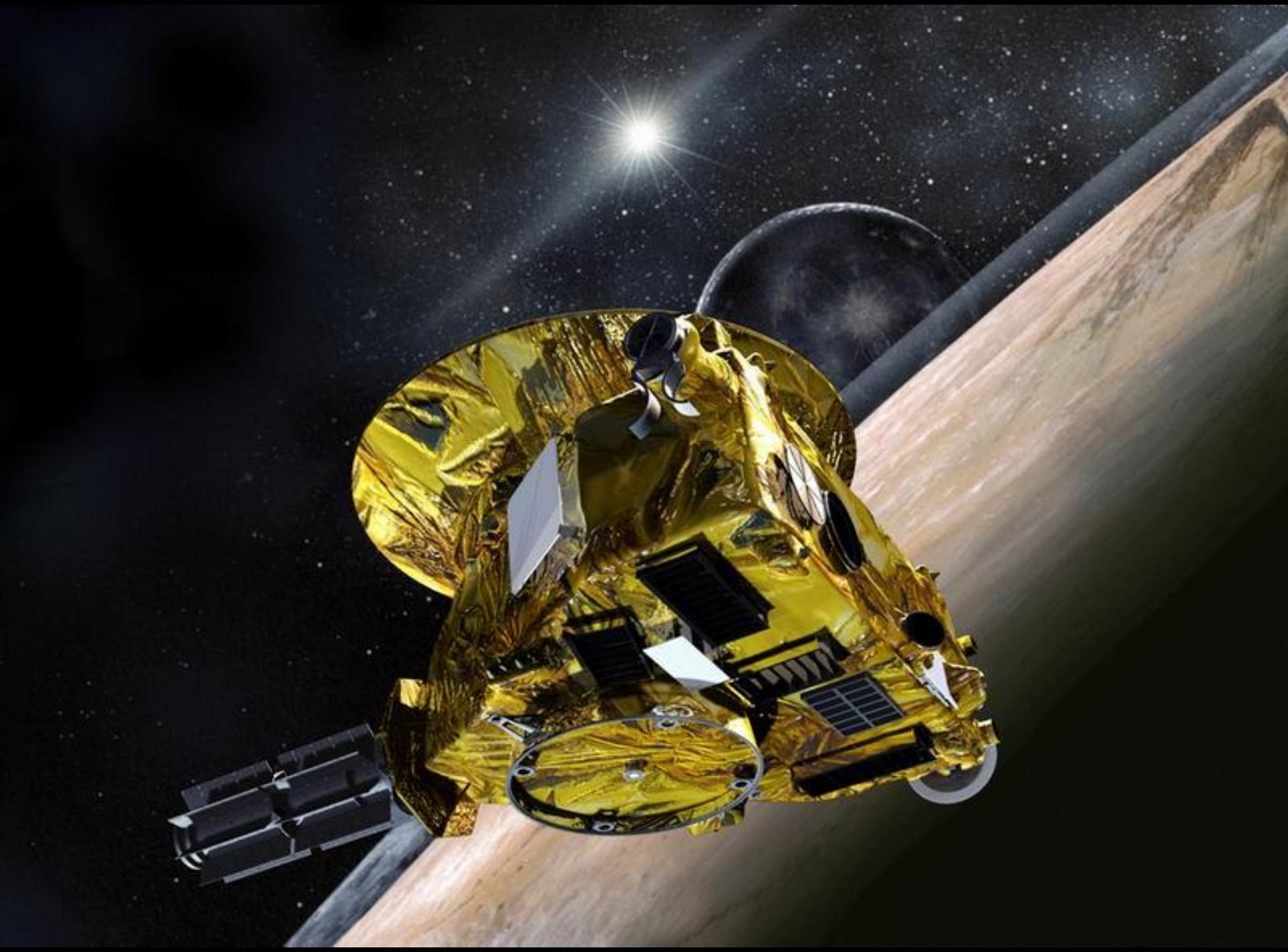
# Pluto Express/Kuiper Express



*Pluto Express/Pluto Fast Flyby*





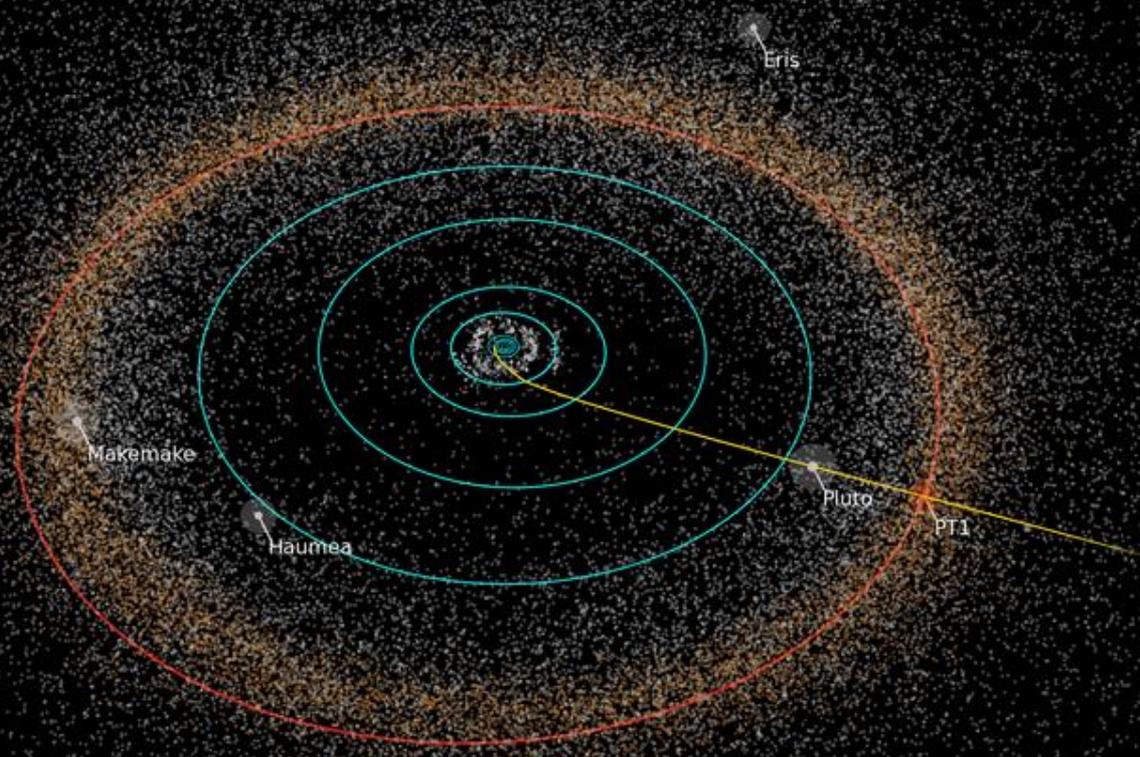








2015-07-14 02:42:02 UTC  
CHARON



Eris

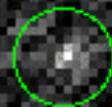
Makemake

Haumea

Pluto

PT1

1. ledna 2019



PT1

**JUNO**

---

# MEASURE Jupiter

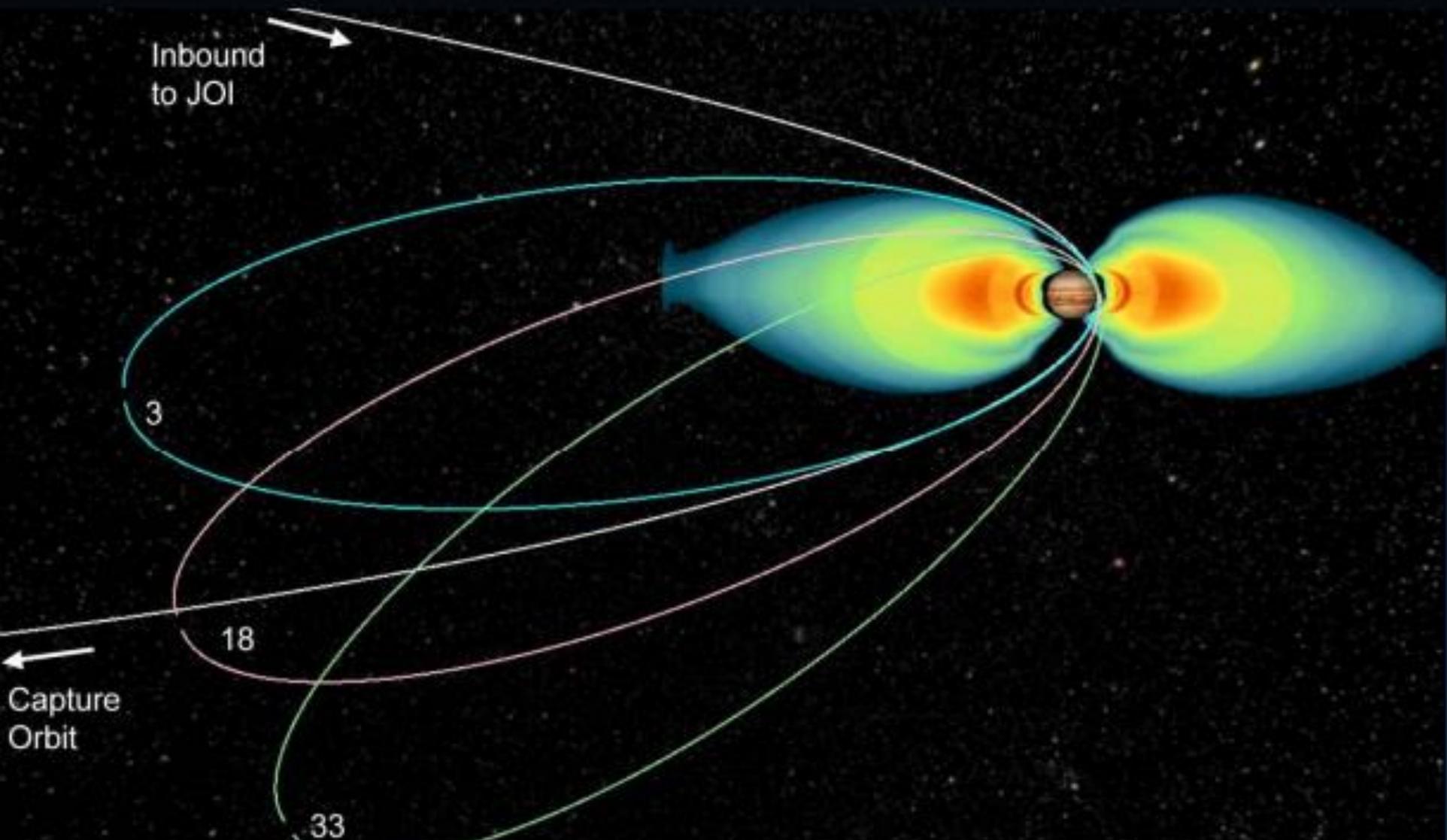


# *Moonrise vs. JUNO*



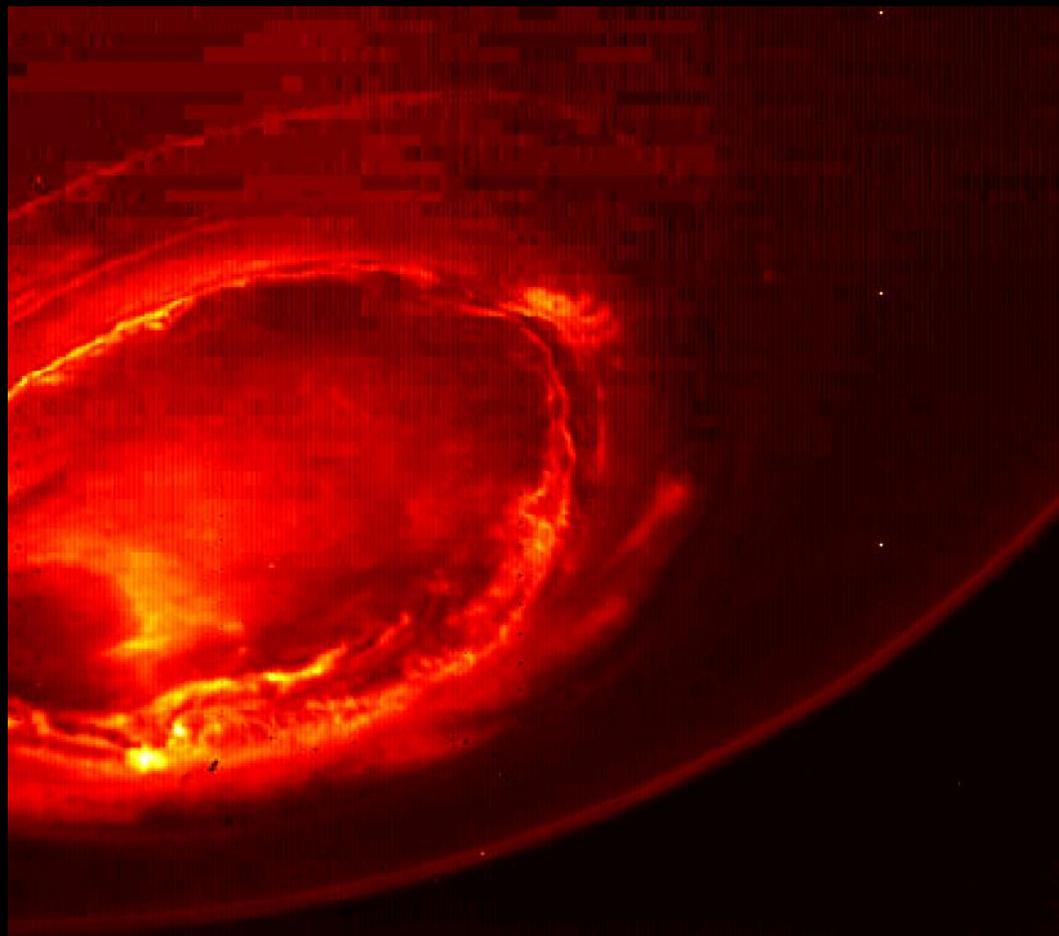


18 kW u Země – 450 W u Jupitera



**Radiační pásy, pevné jádro aj.**

Start srpen 2011, přílet červenec 2016

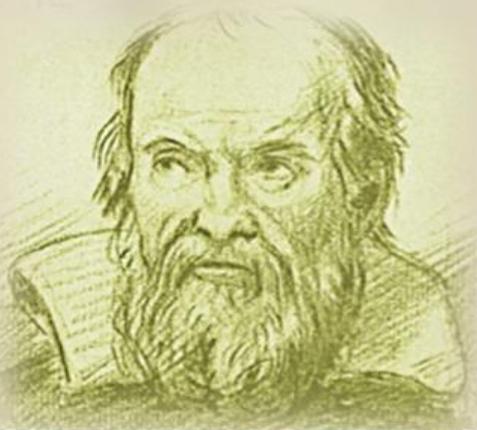


37 obletů, 20 měsíců (15 měsíců)

53 dní vs. 14 dní (11 dní)

7,1 x 5,1 cm, 6 g

Adi 11. era in questa guisa \*\* ☉. et la stella più vicina  
à Giove era l'arneta minore dell'altra, et vicinissima all'altra  
come che se altre sare erano le dette stelle apparite tutte tre  
di equal grandezza et così loro equalm. lontane; dal che  
appare intorno à Giove esser 3. altre stelle erranti invisibili ad  
ogni uno sino à questo tempo.



Galileo Galilei

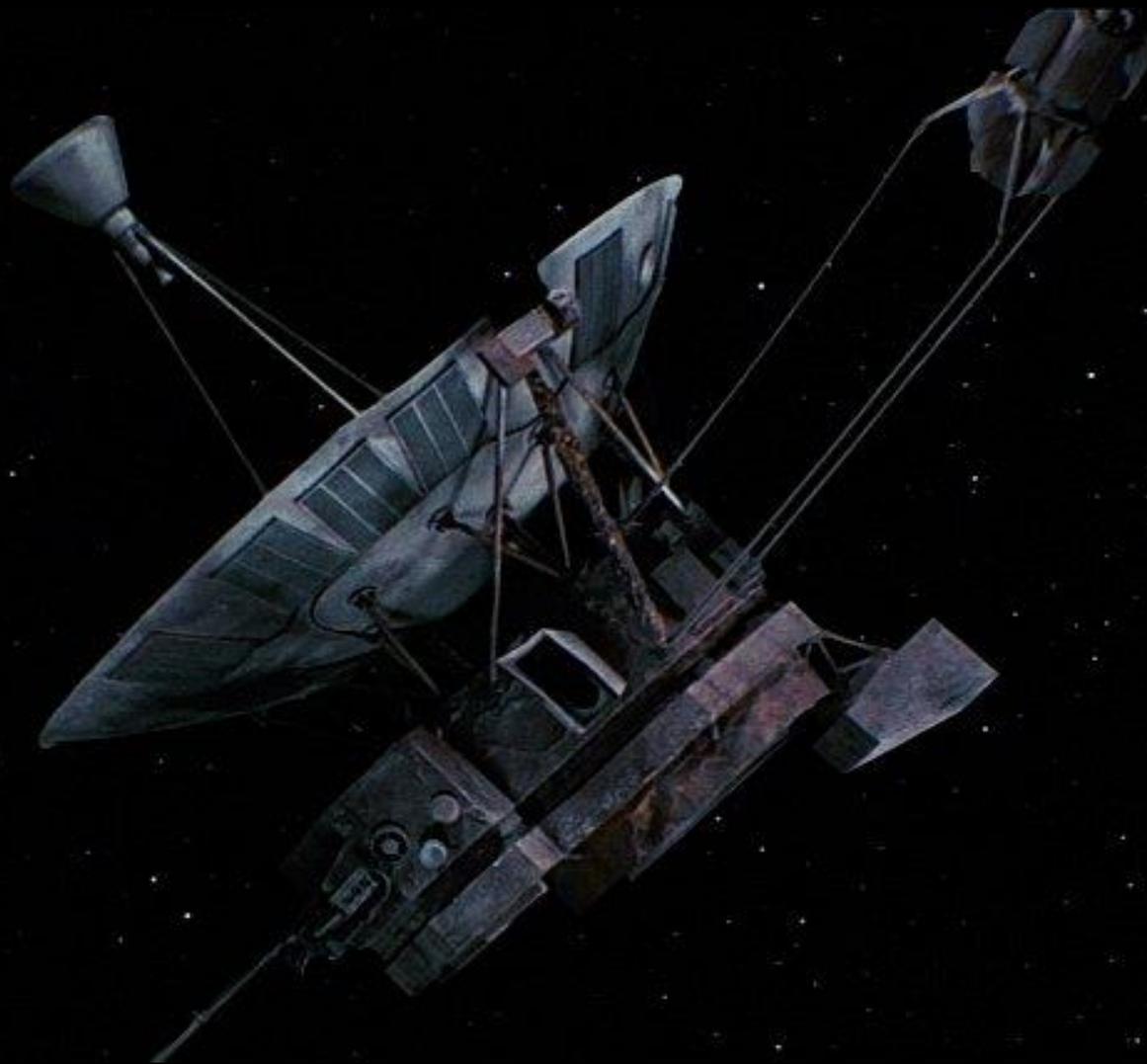


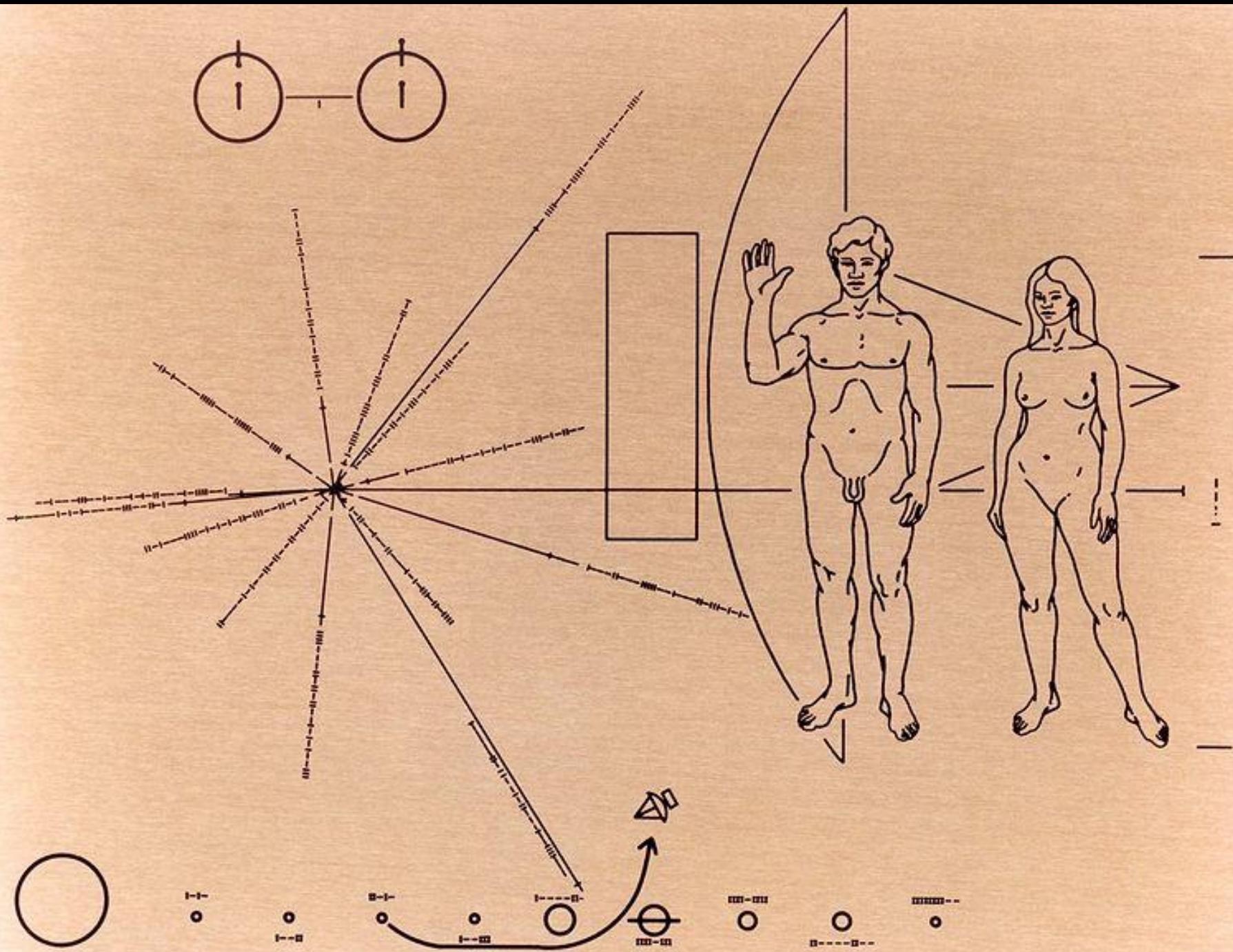


*DVD: 616420 podpisů*



# Pioneer 10 a 11





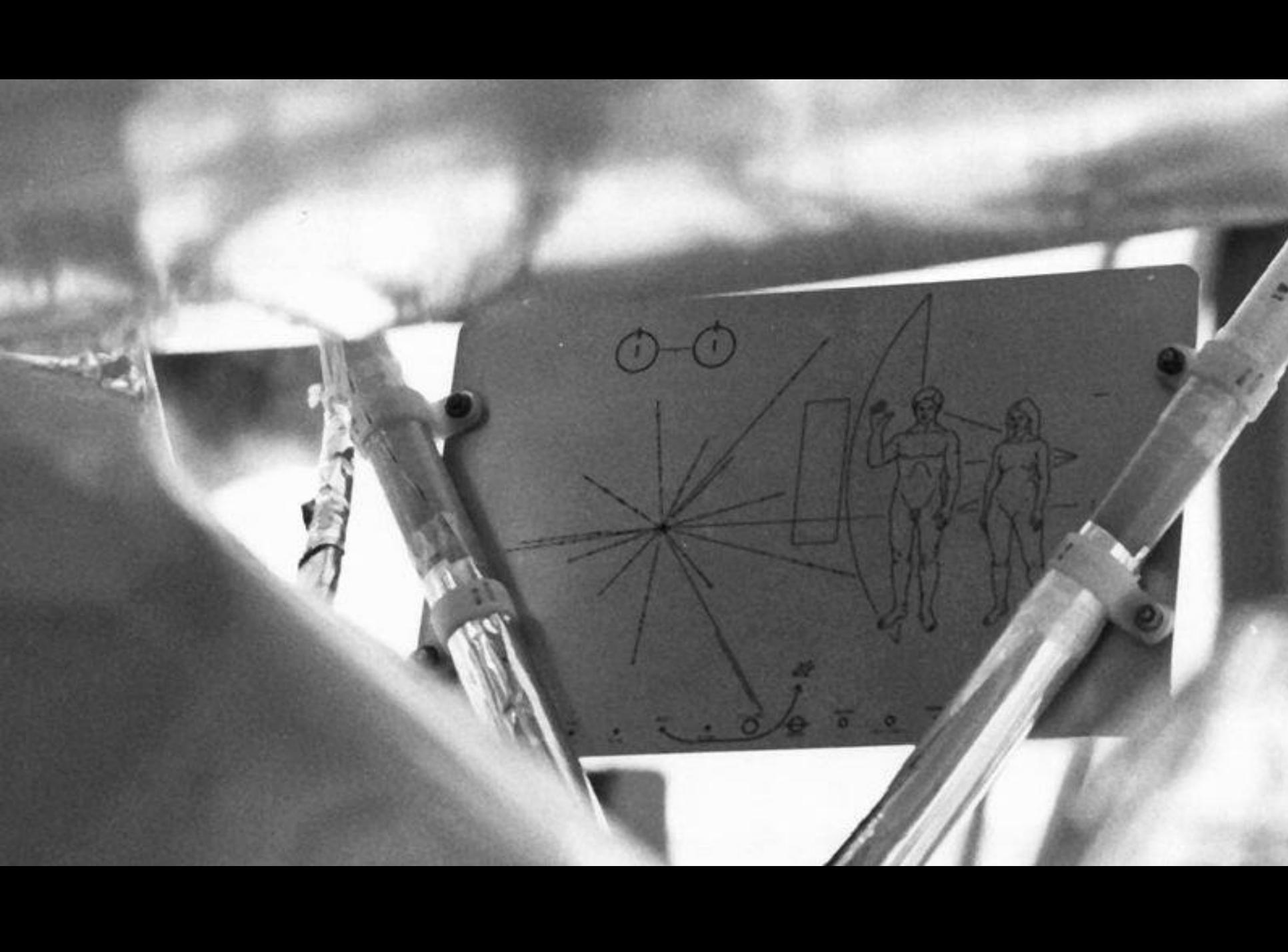
# Carl Sagan

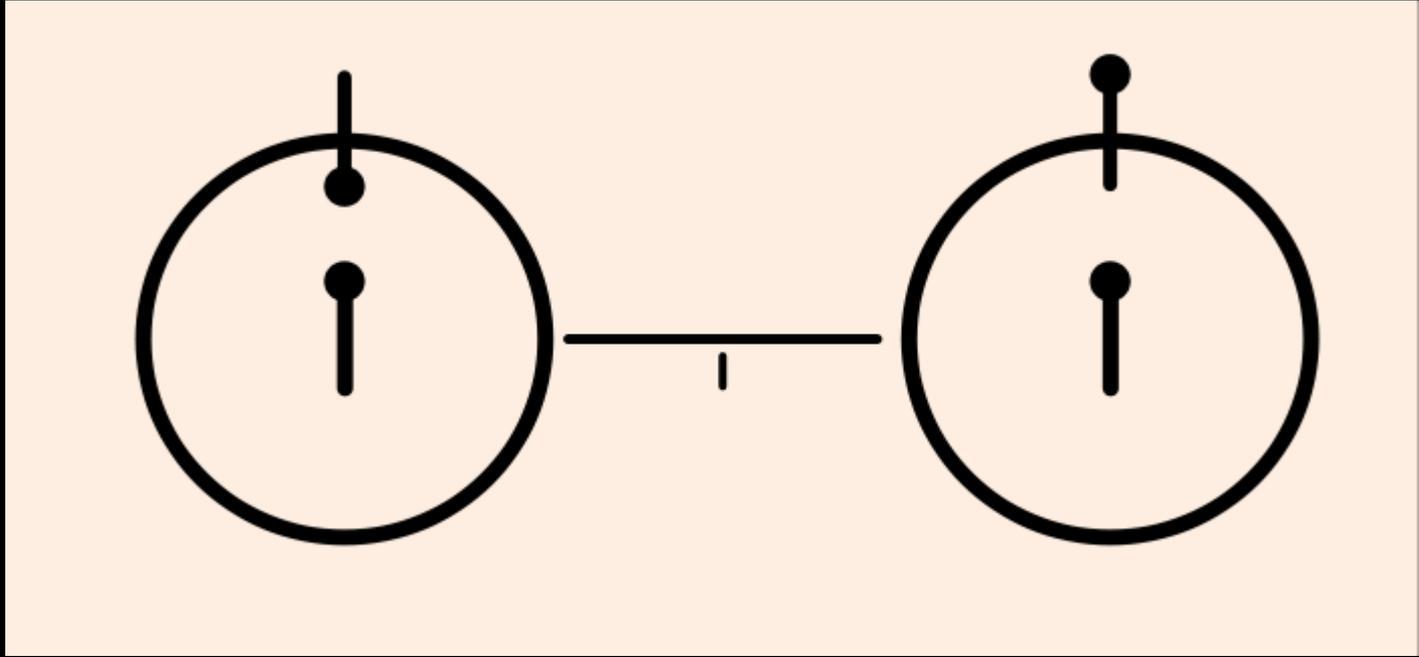


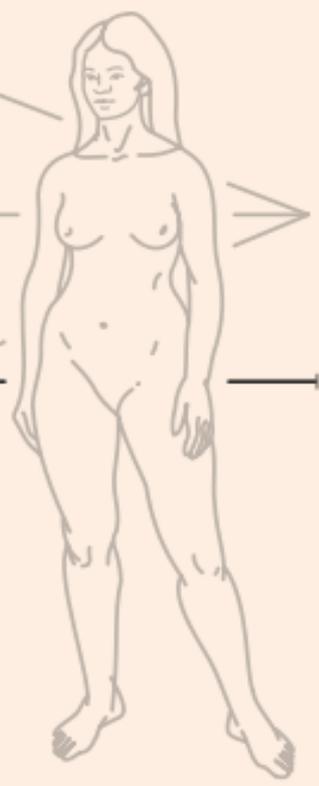
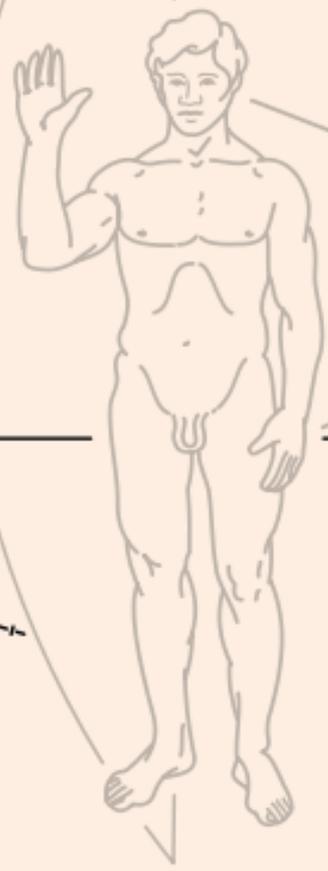
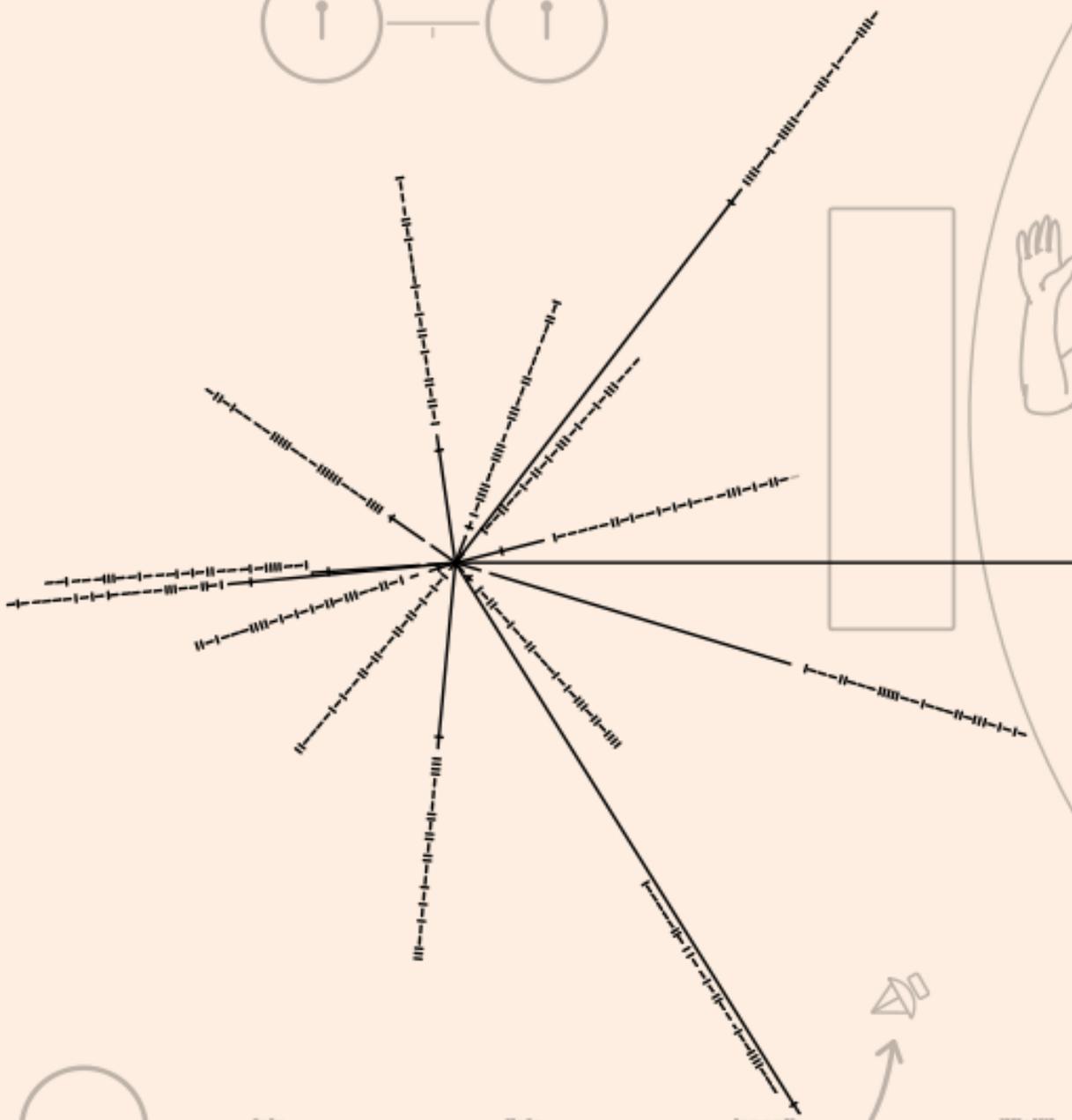
# Carl Sagan Memorial Station











I-I-

II-I-

I---II-

IIII-III

IIIIII--



1-1-



1--22

22-1-



1--222

1-----22



2222-222

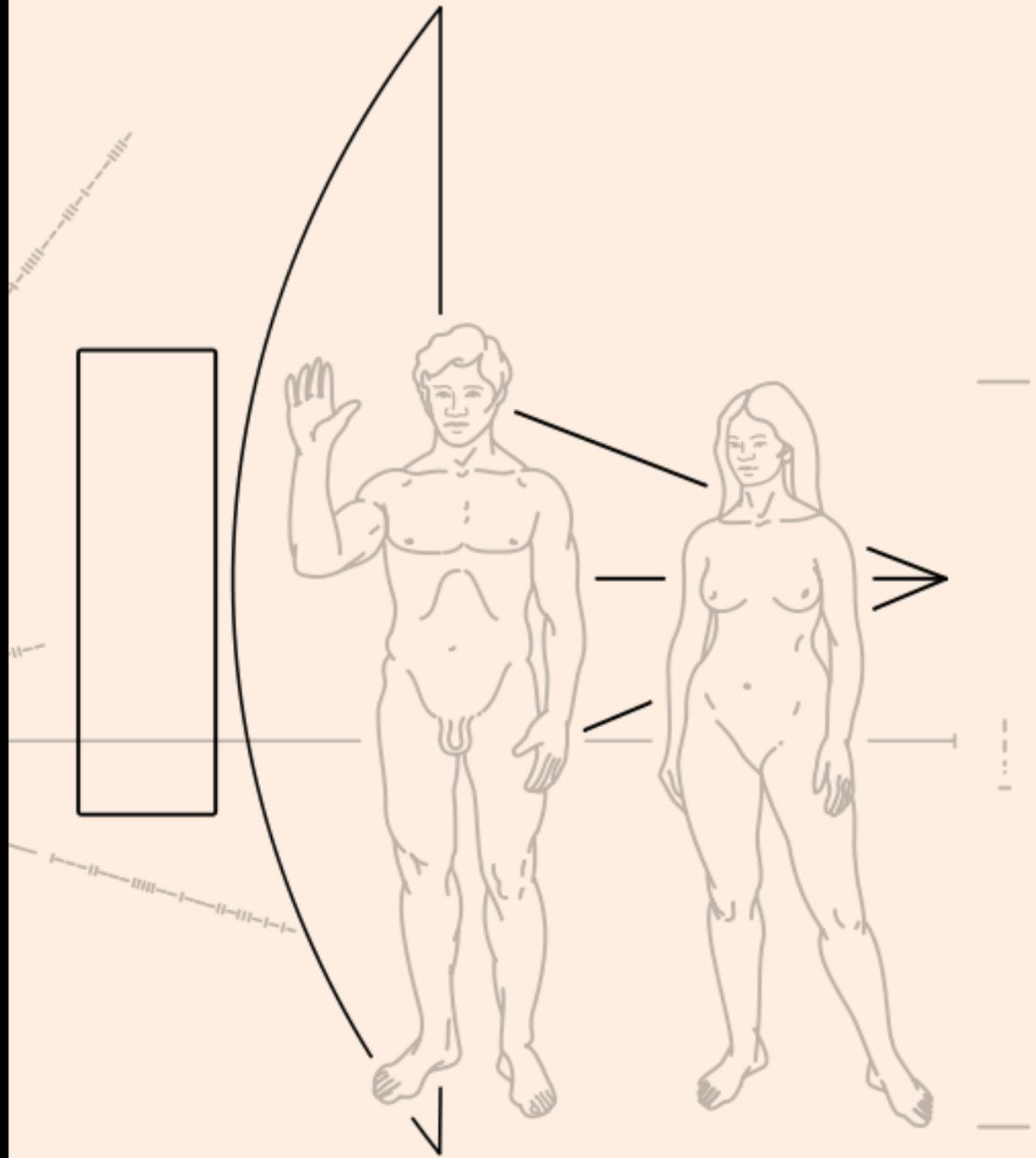
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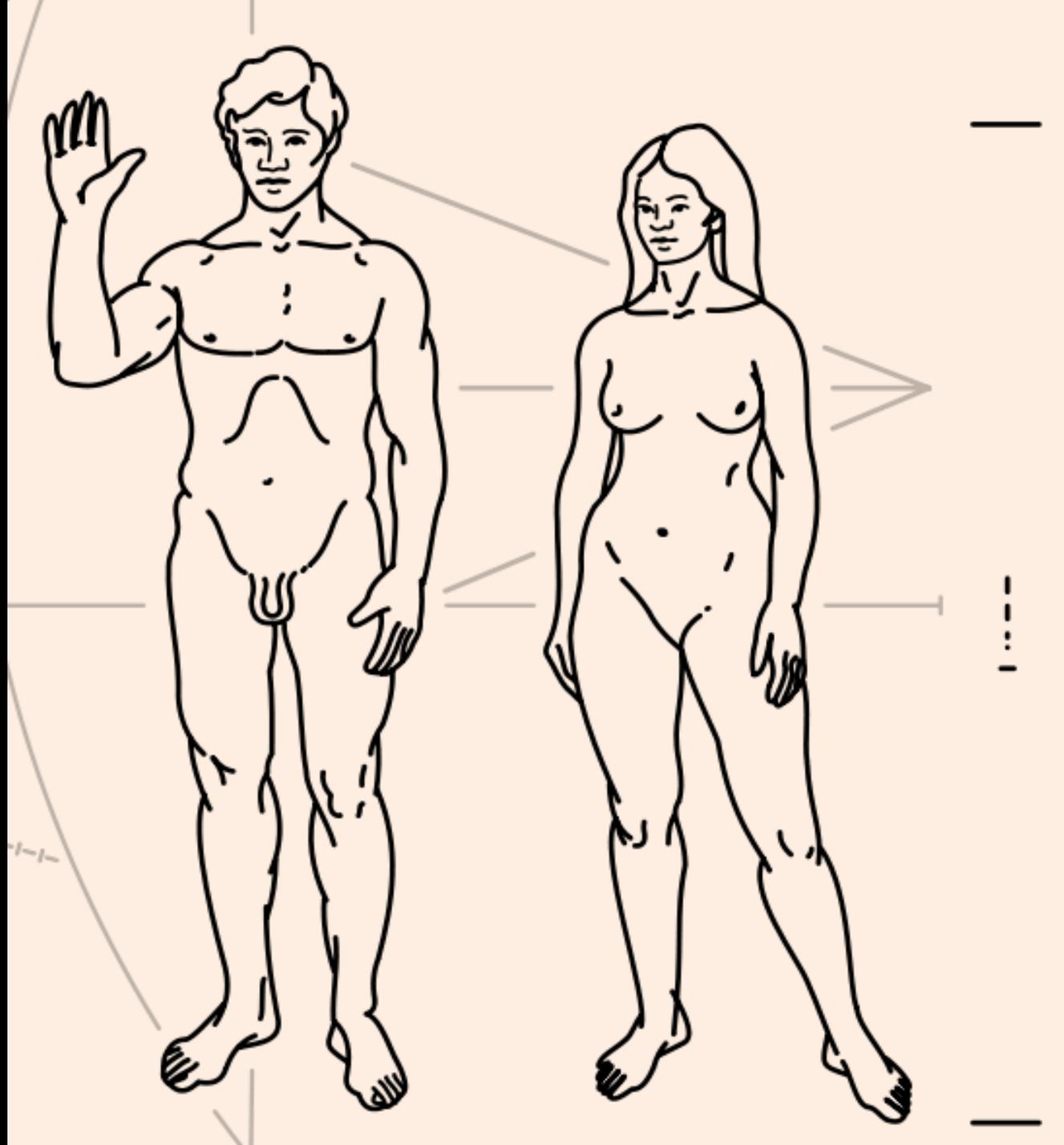


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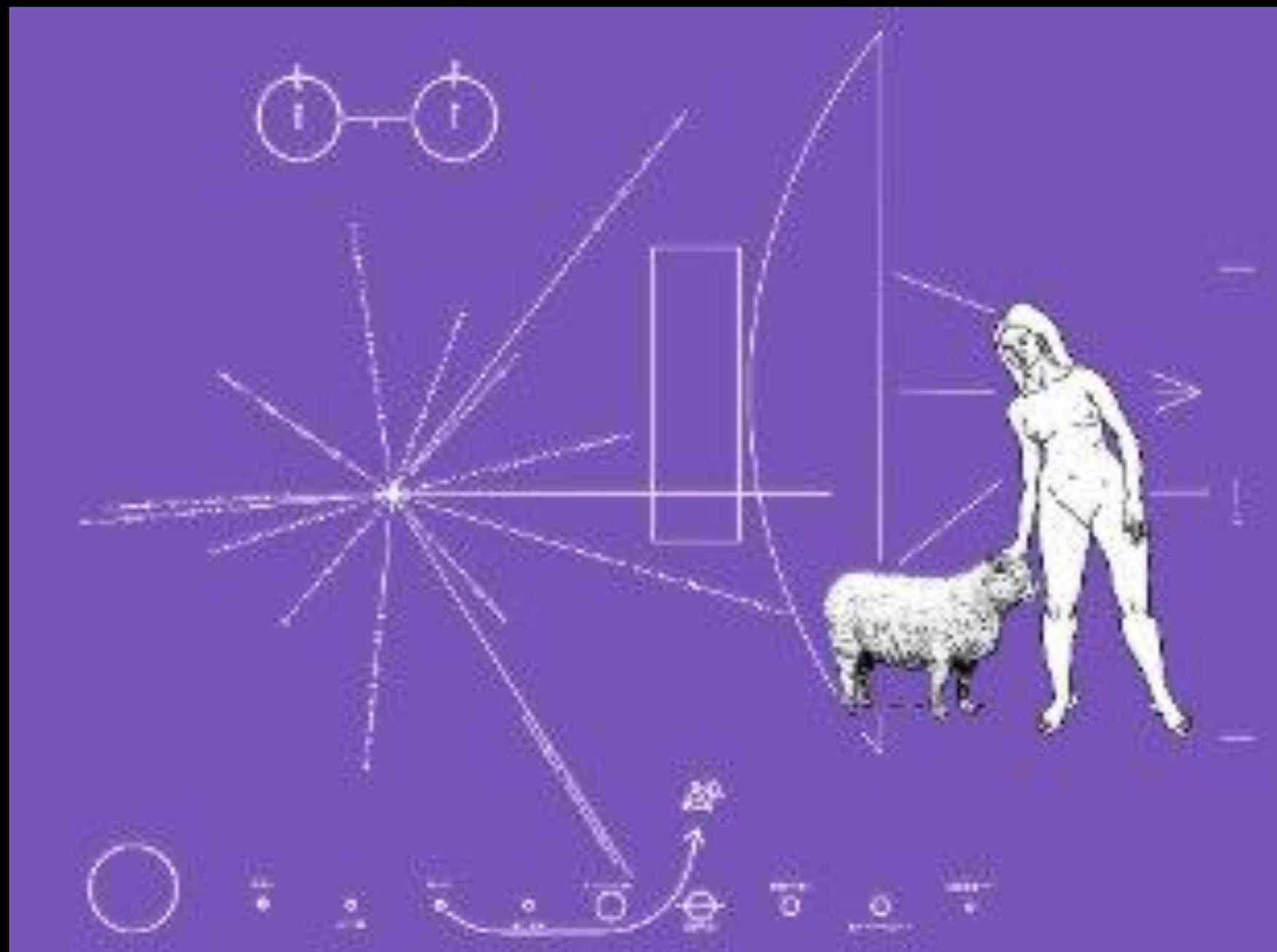
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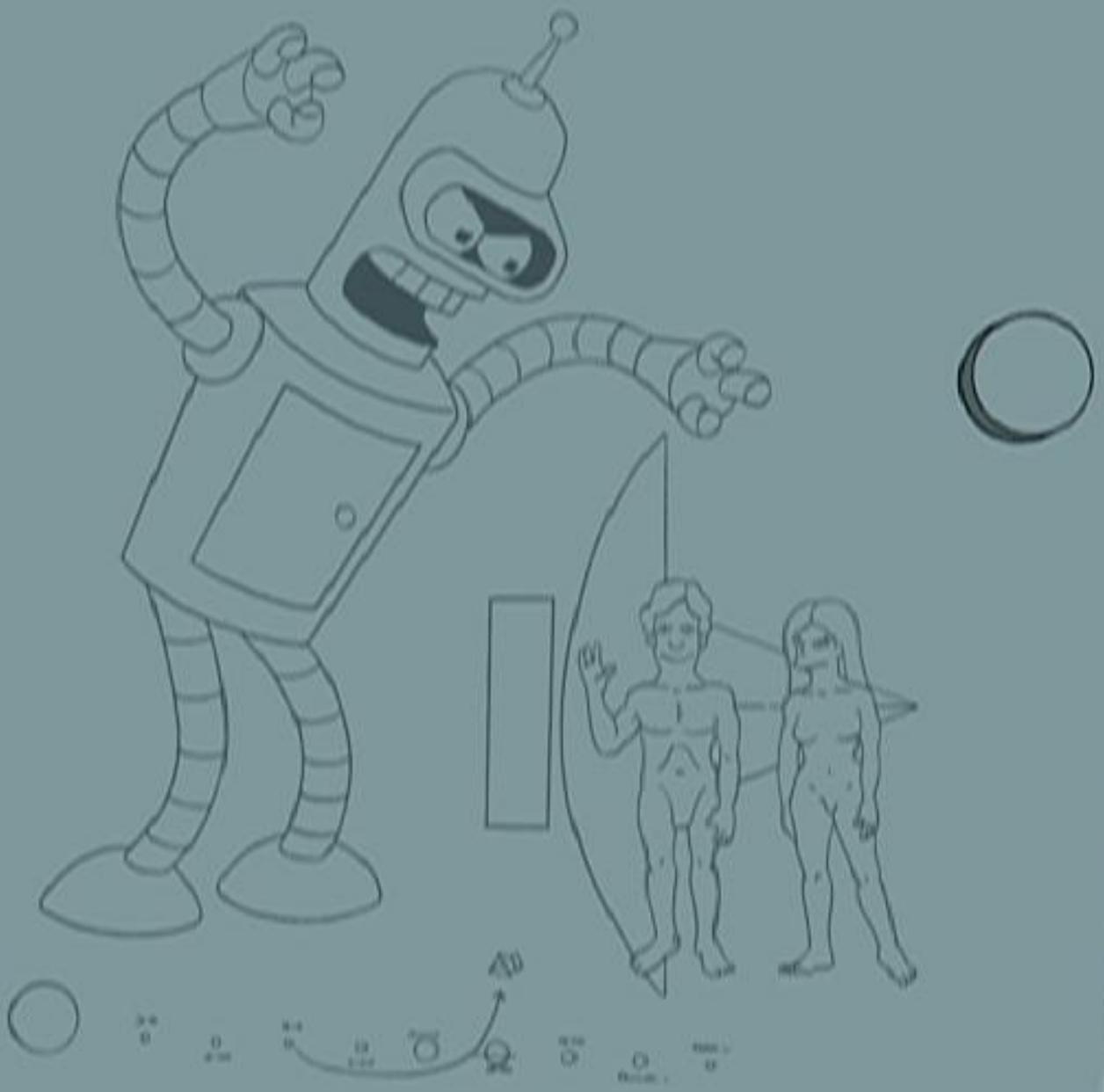




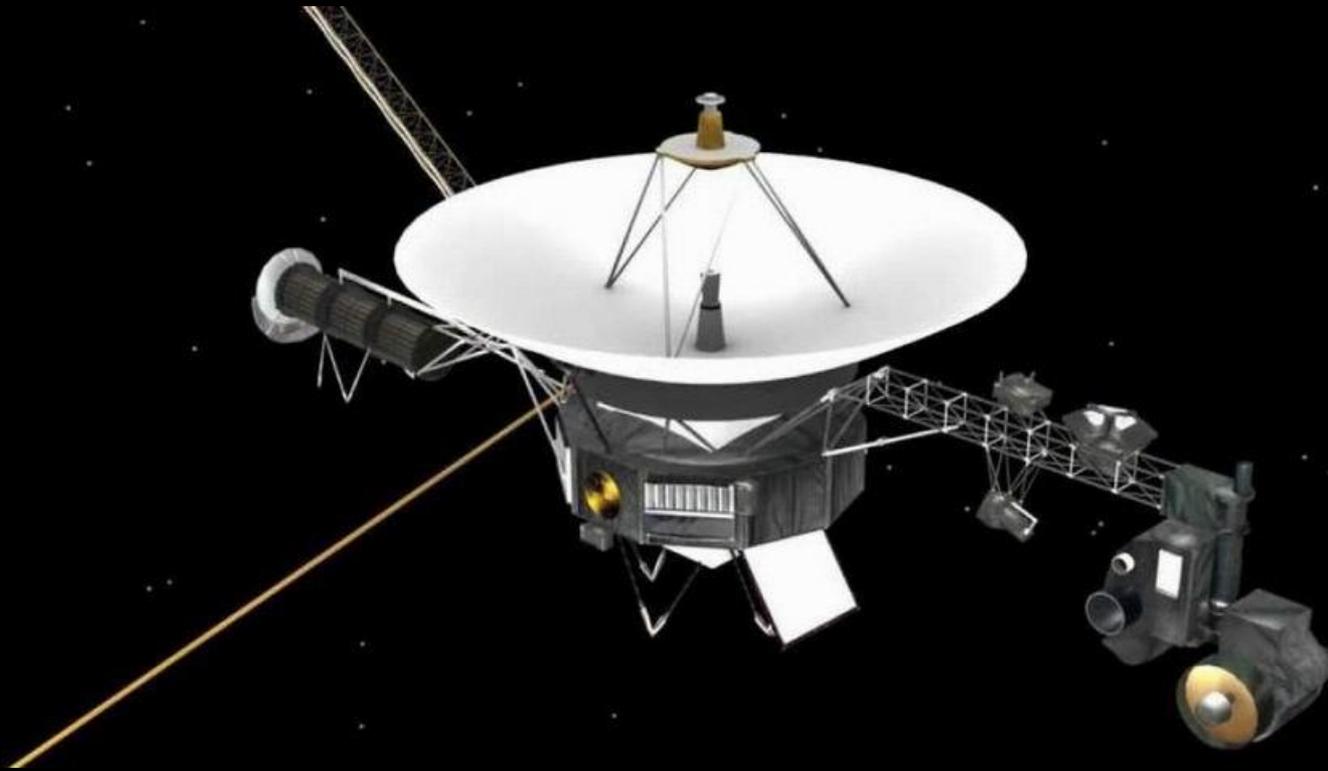




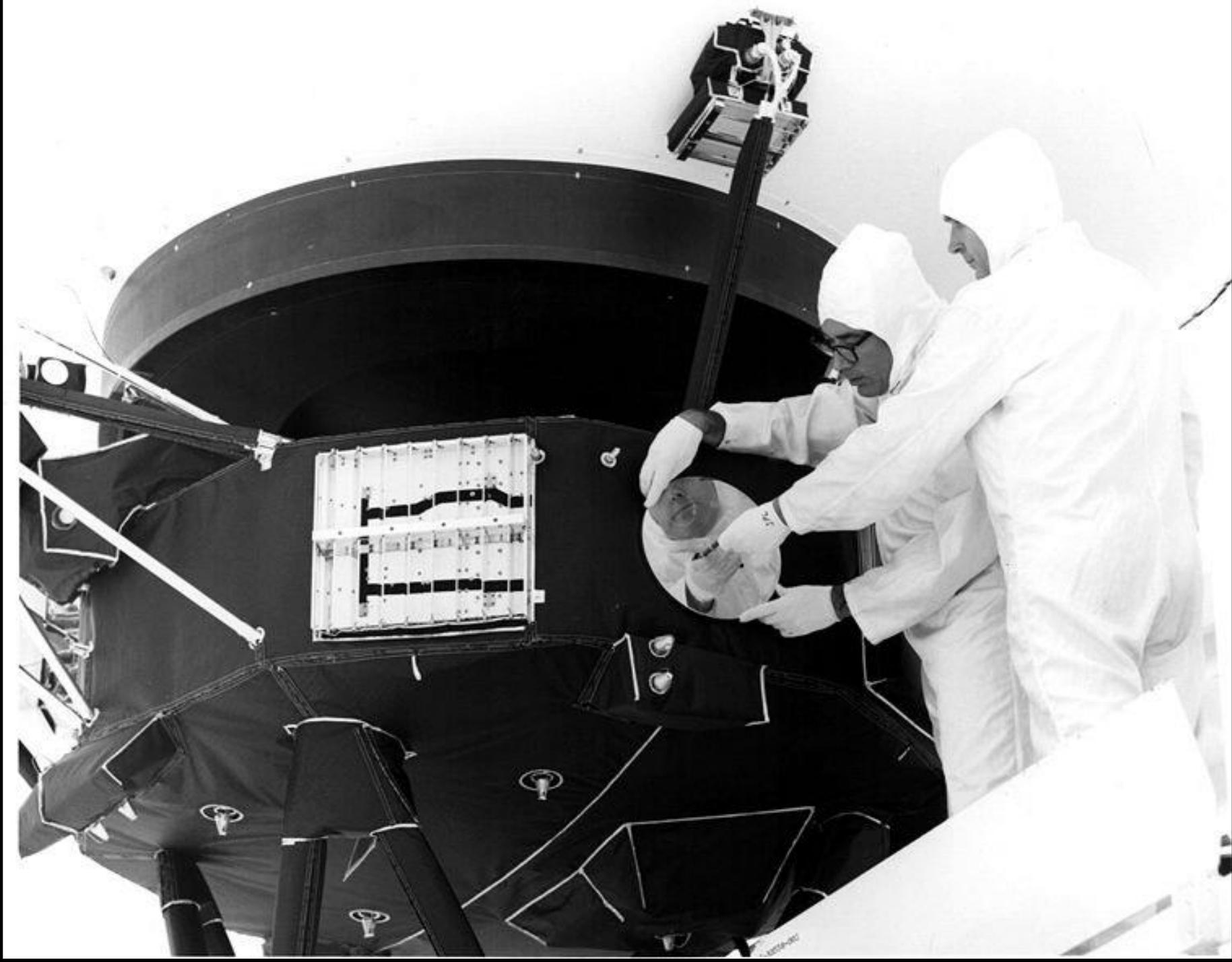




# Voyager 1 a 2







# Václav Otakar Kostroun (80)



# *New Horizons*



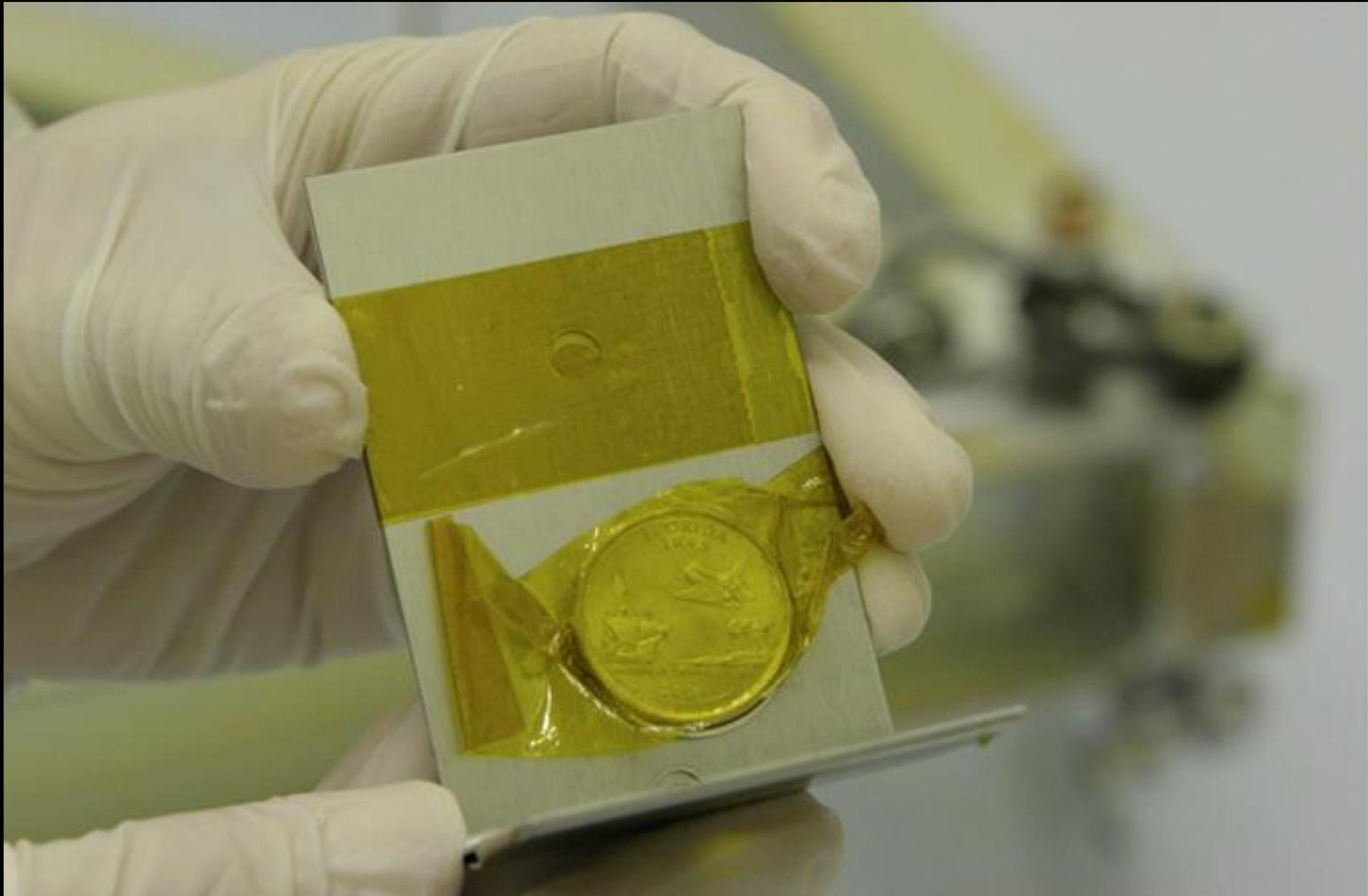
9 předmětů

CD 434 738 jmen



CD projekt New Horizons

# Čtvrťák Florida a Maryland



Johns Hopkins University

# Známka „Not Yet Explored“



MERCURY MARINER 10 29 USA



VENUS MARINER 2 29 USA



EARTH LANDSAT 29 USA



MOON LUNAR ORBITER 29 USA



MARS VIKING ORBITER 29 USA



JUPITER PIONEER 11 29 USA



SATURN VOYAGER 2 29 USA



URANUS VOYAGER 2 29 USA



NEPTUNE VOYAGER 2 29 USA

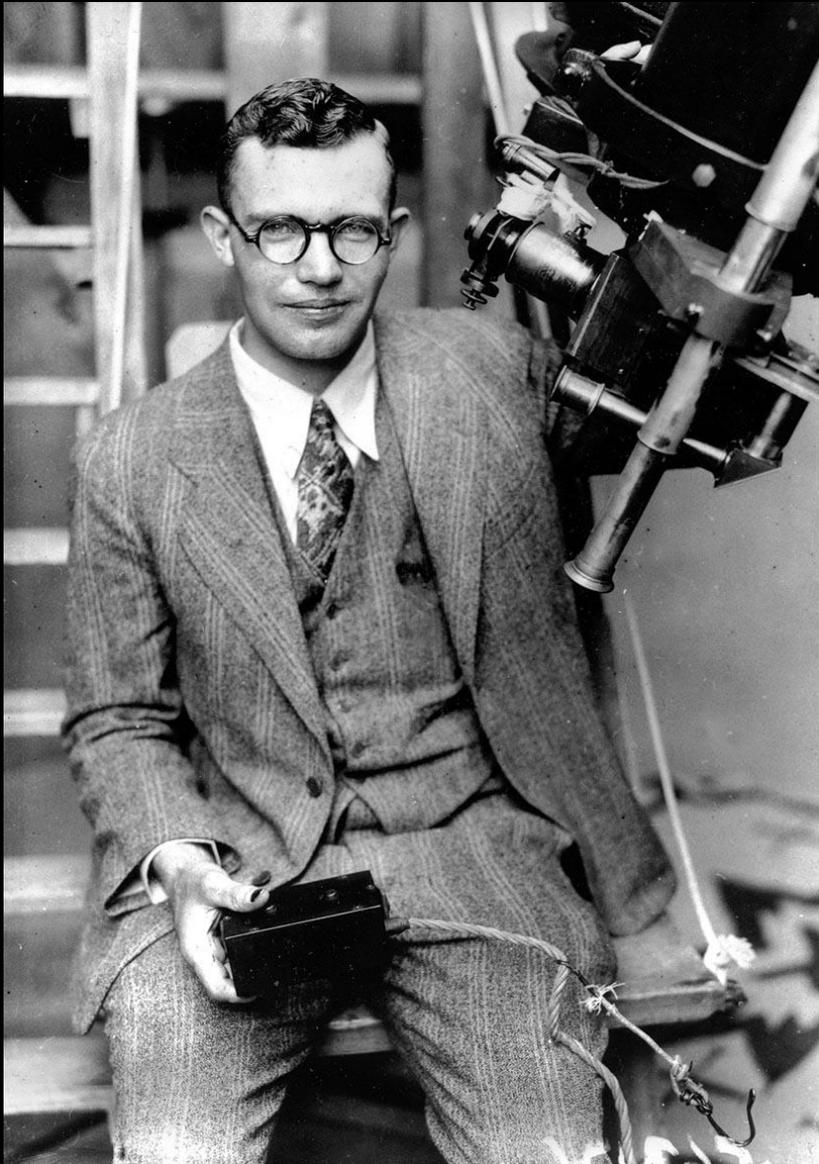


PLUTO NOT YET EXPLORED 29 USA

# *Kus SpaceShipOne*



# Clyde Tombaugh



*Děkuji  
za pozornost!*

Tomáš PŘIBYL  
tomas.pribyl@seznam.cz  
www.kosmonaut.cz

