

**Mit keres a Puli a Holdon?**

HTE 2021-05-12







**2010 június: alapítás**

**Google Lunar XPRIZE  
részvevő**

**2016 augusztus  
Holdi szállítási szerződés**



[pulispace.com](http://pulispace.com)



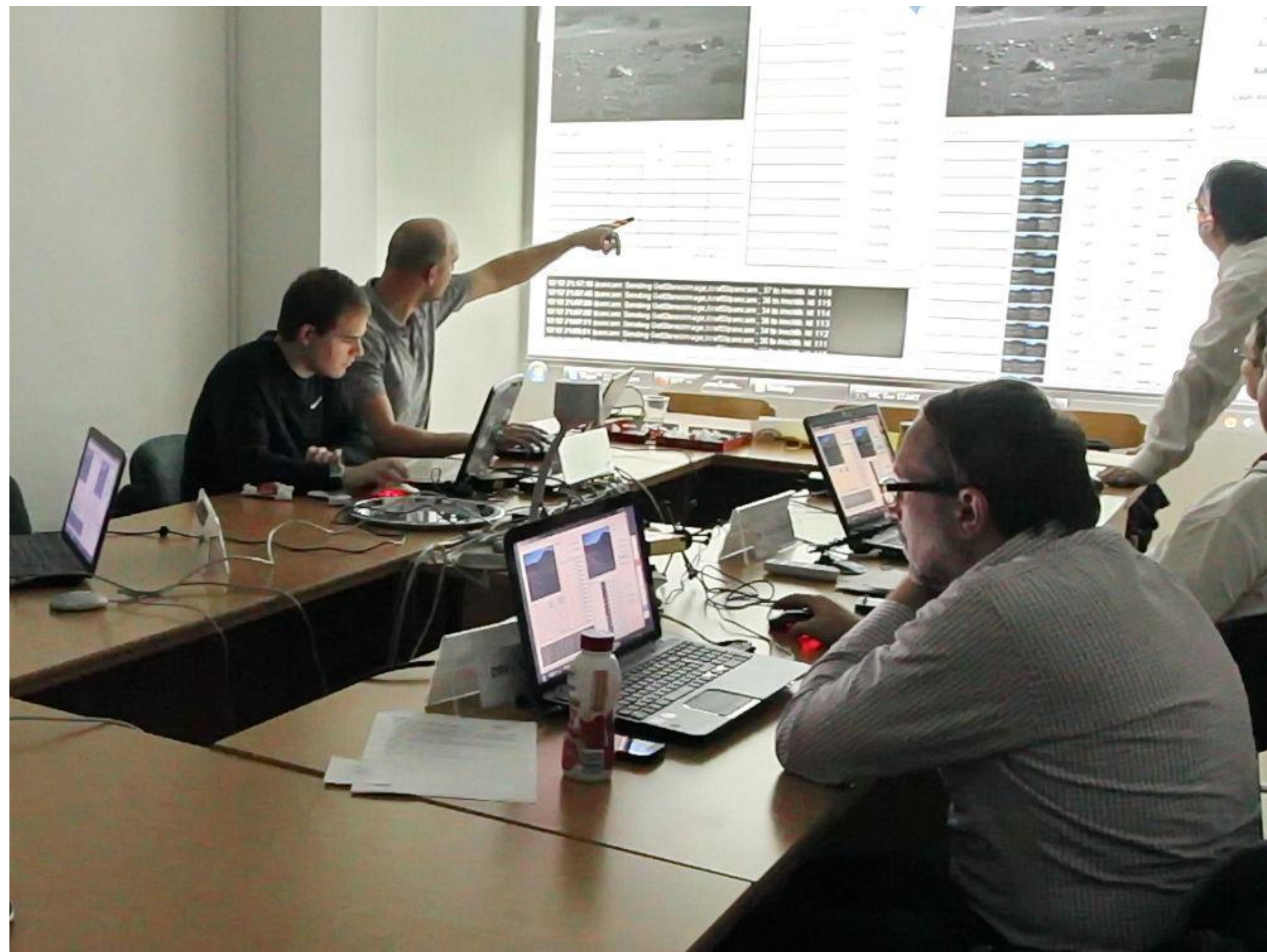
[/pulispace](https://www.facebook.com/pulispace)



[/company/puli-space](https://www.linkedin.com/company/puli-space)



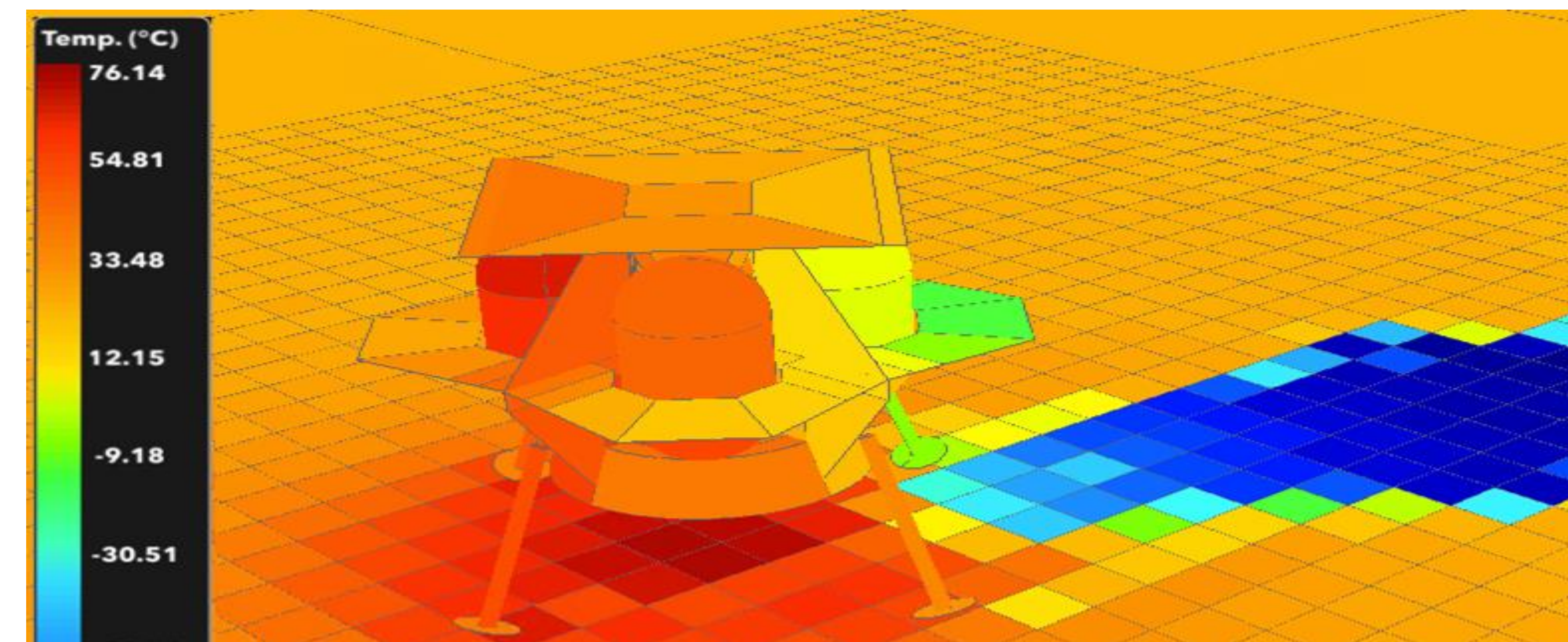
## Prototípus roverek



## Holdi környezet szimulációk & küldetéstervezés



## Küldetésirányítás távolról

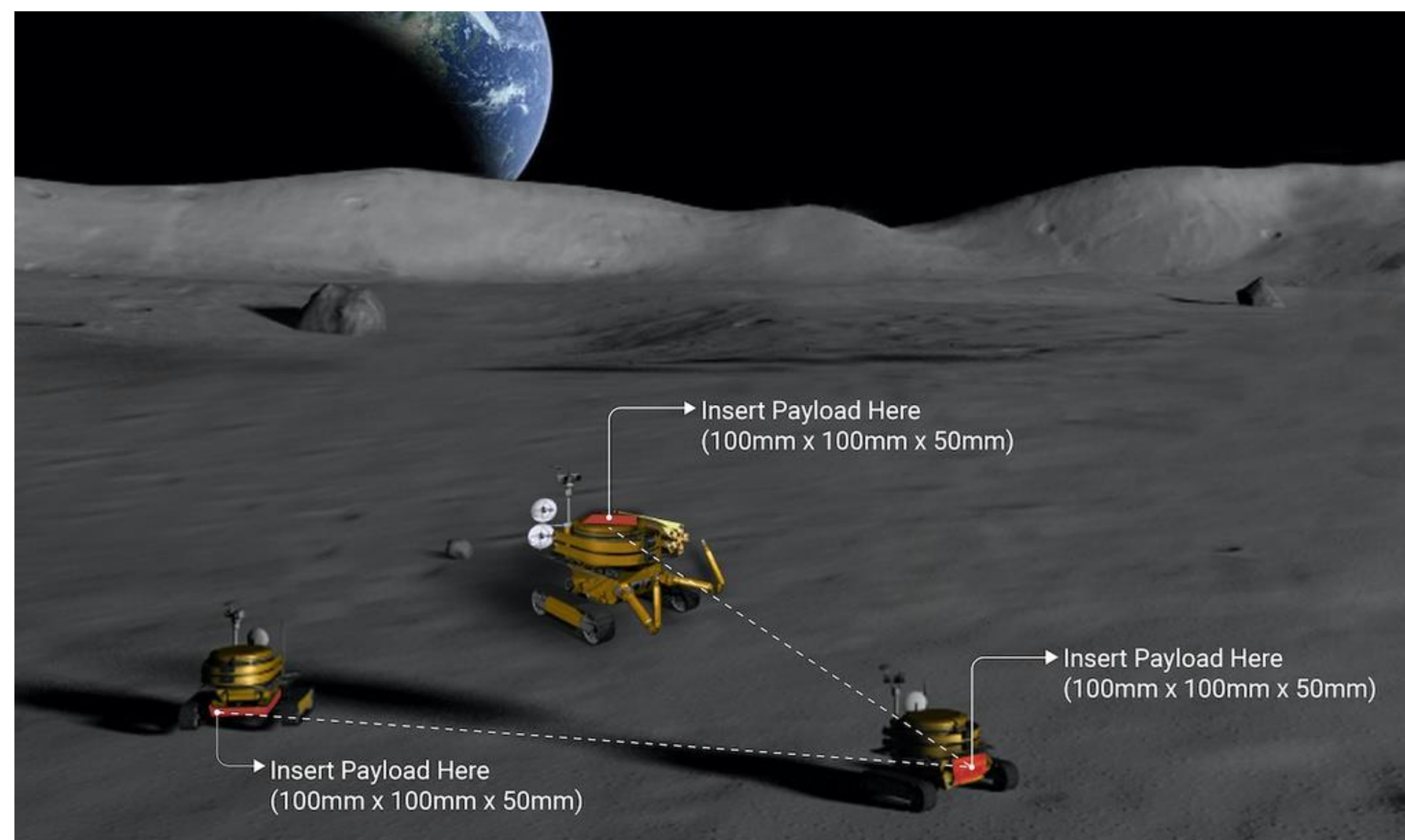






**Sosem tudjuk pontosan**  
**- mi vár ránk**  
**- kivel találkozunk**





## NASA verseny - amit keresnek:

- kicsi, könnyű mérőműszerek
- a Holdra!

- maximális méret:

**100mm x 100mm x 50 mm**

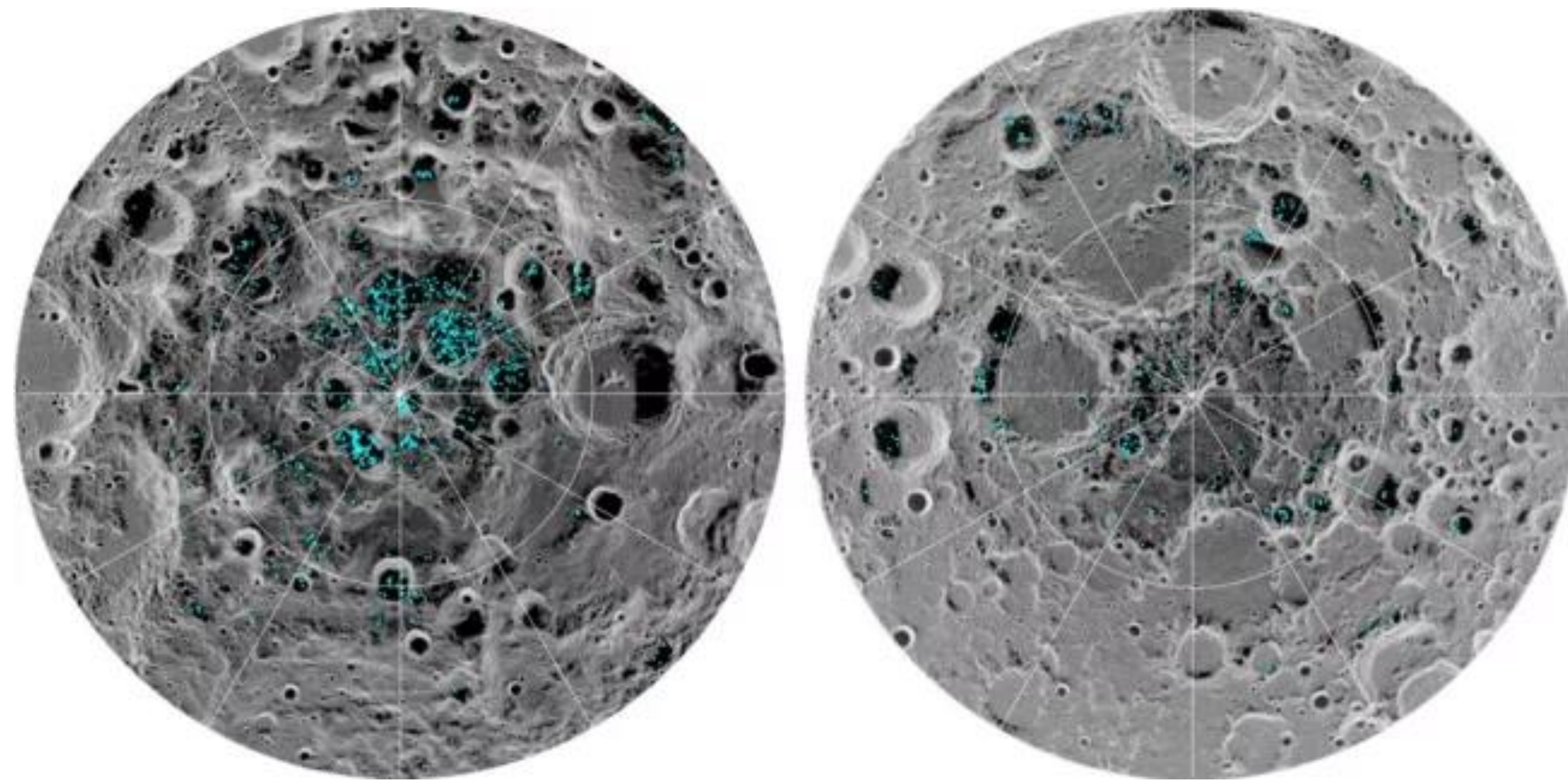
- tömeg < 400 gr

**Puli Lunar  
Water Snooper**



**2020 július - első díj**  
**2021 január – a folytatás**  
**NASA támogatás: 225 ezer USD**





## Vízjég a holdi pólusok környékén

Adatok: NASA Mineralogy Mapper / Chandrayaan - 1

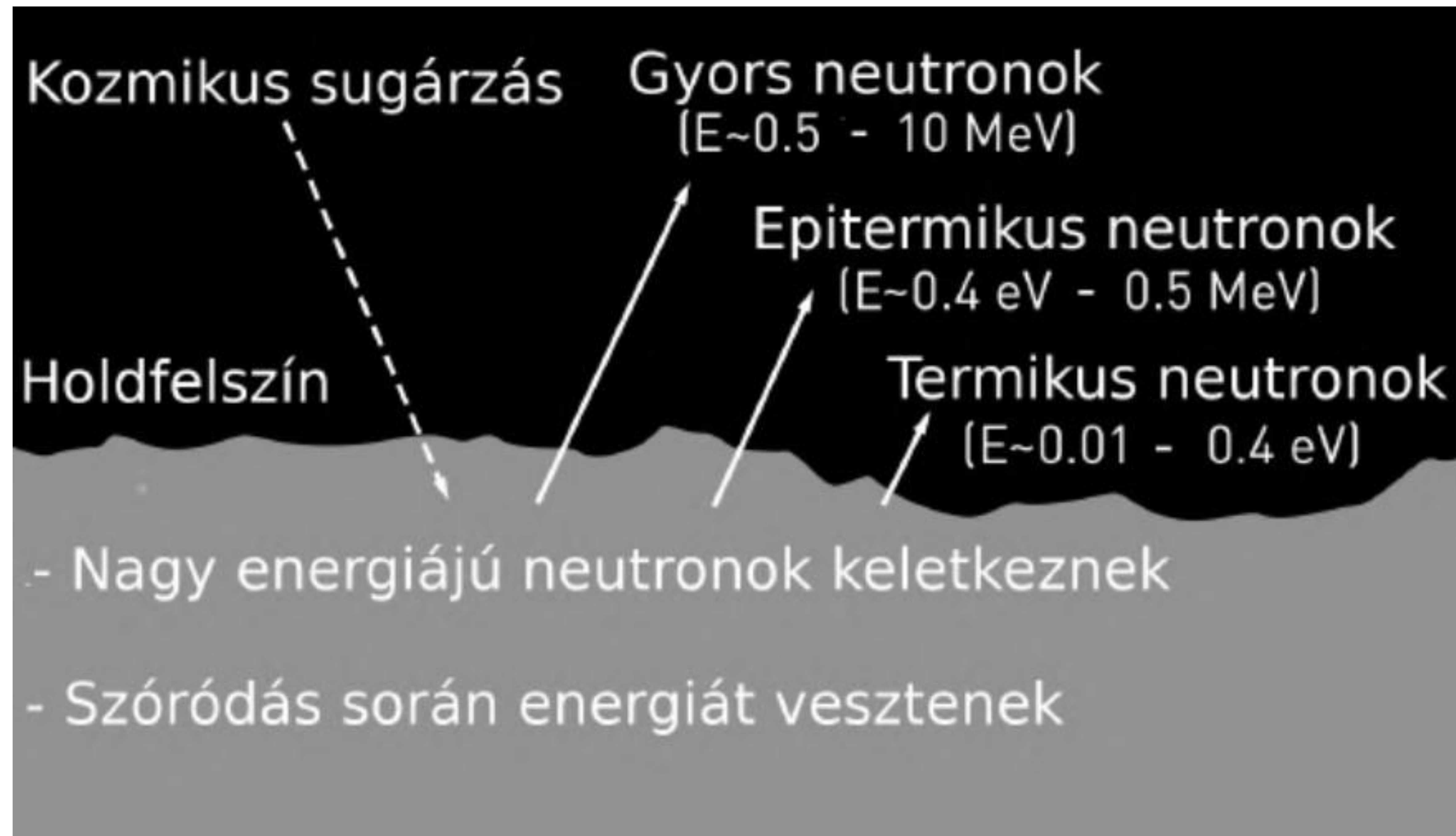
## Víz: értékes erőforrás

- életfenntartás
- rakétaüzemanyag

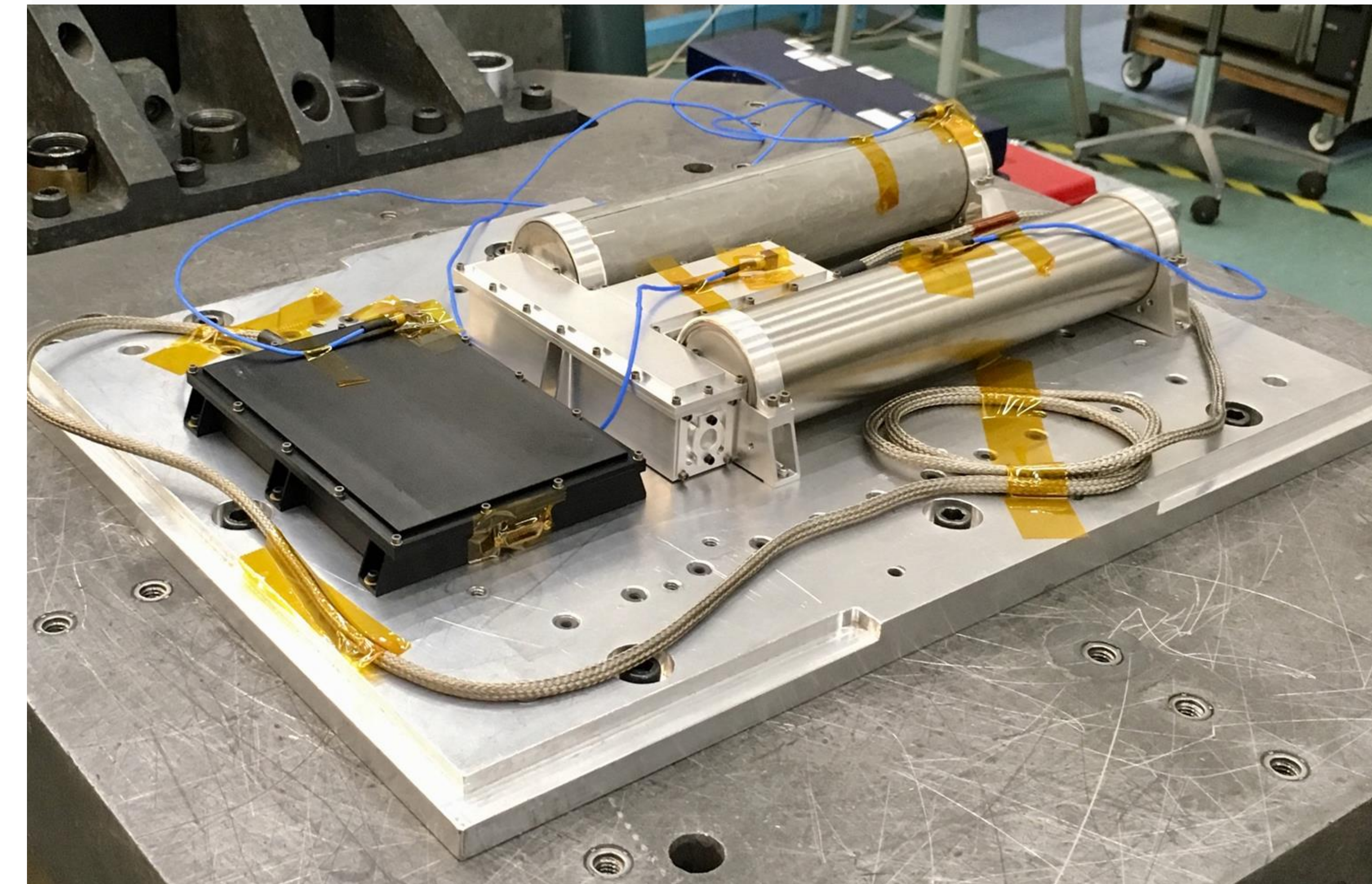
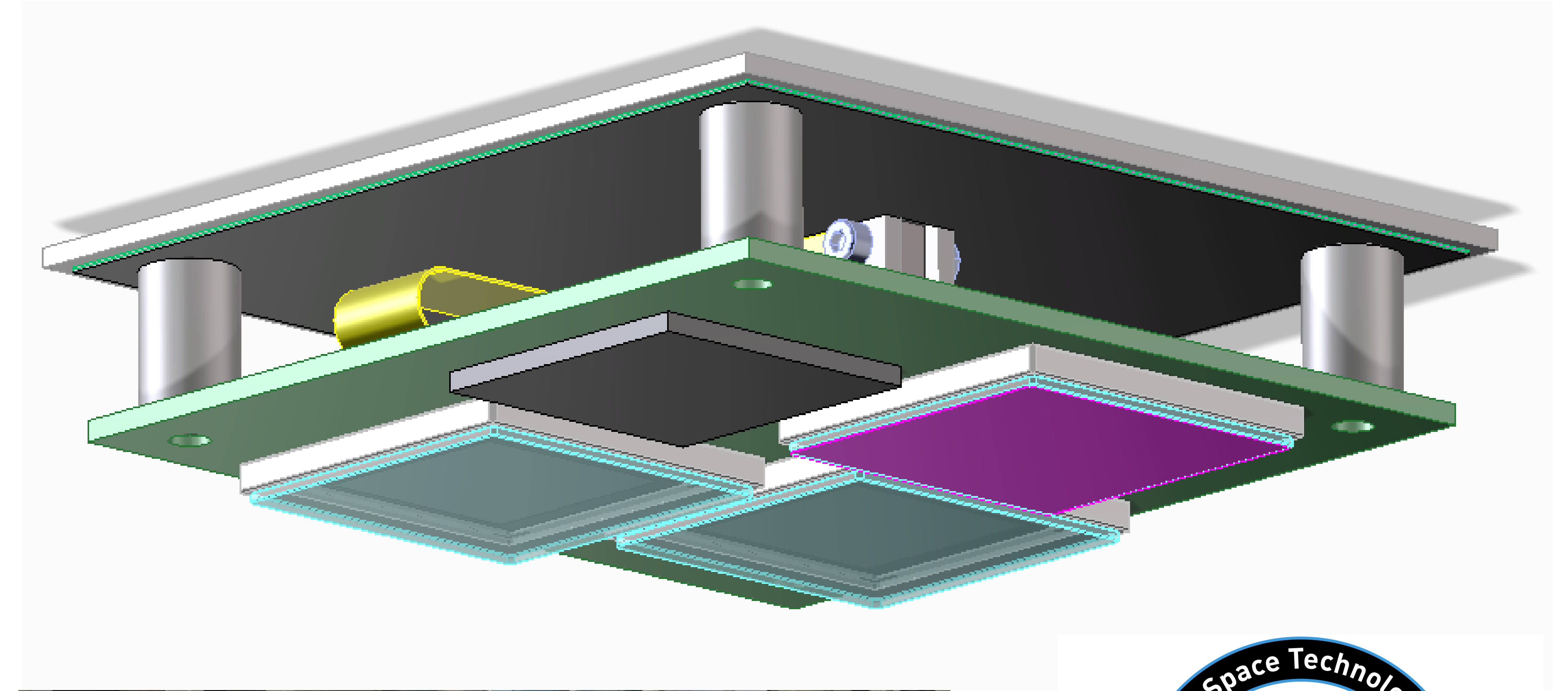
„Fentről” már látjuk

## De mi a rögvalóság?





- Több termikus \_és\_ kevesebb / epitermikus neutron -> magasabb hidrogéntartalom = több vízjég
- neutronspektroszkópia!



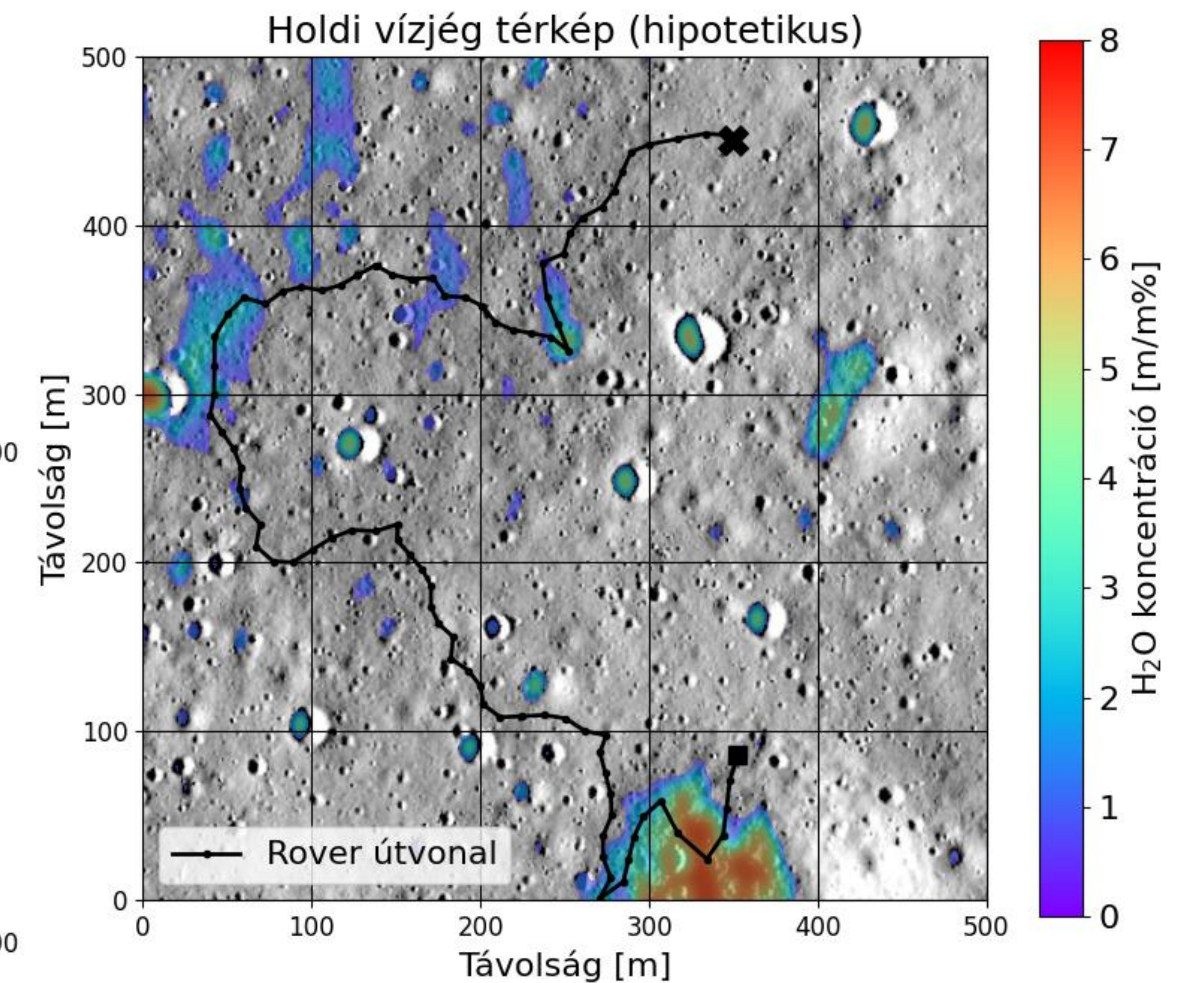
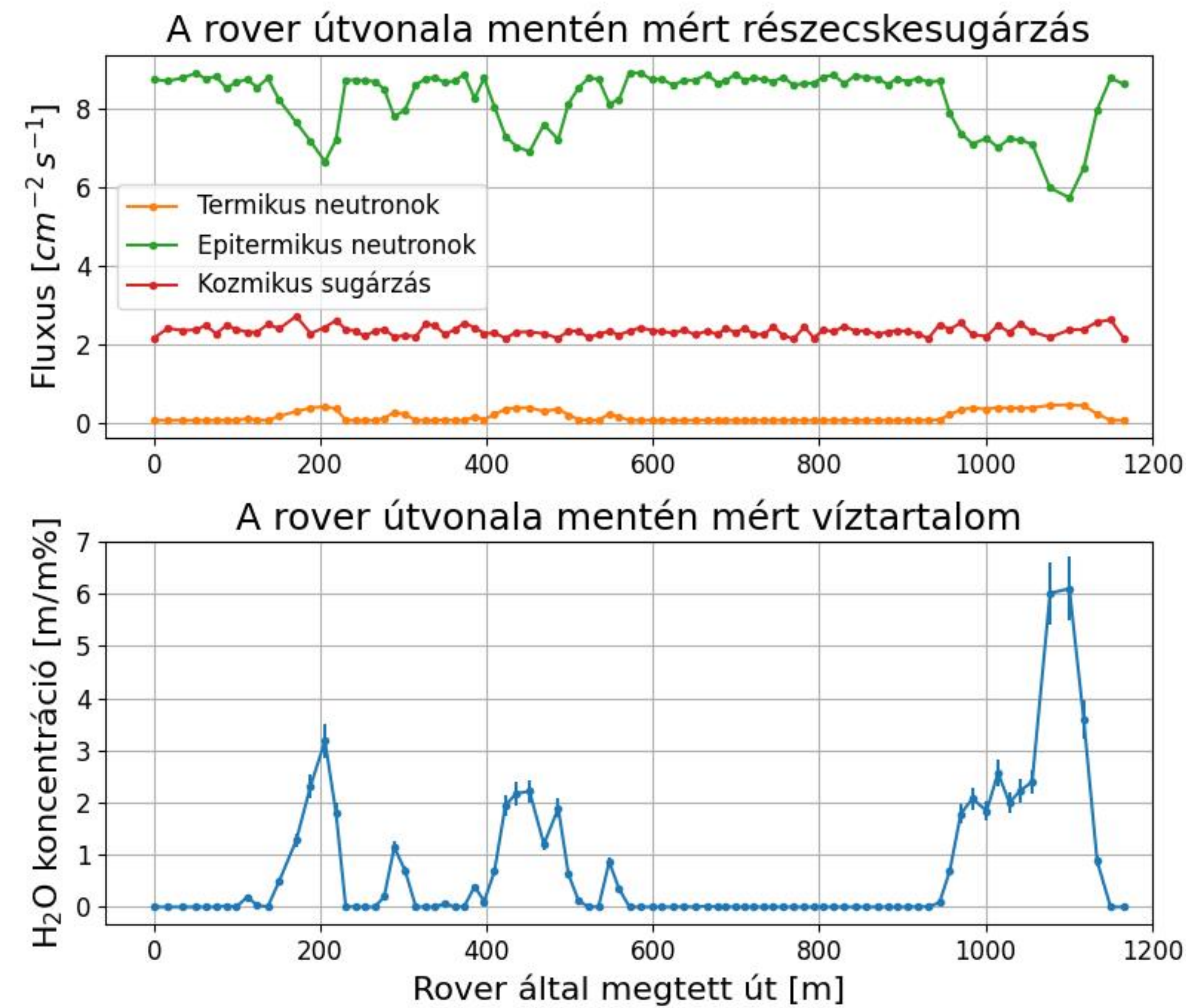
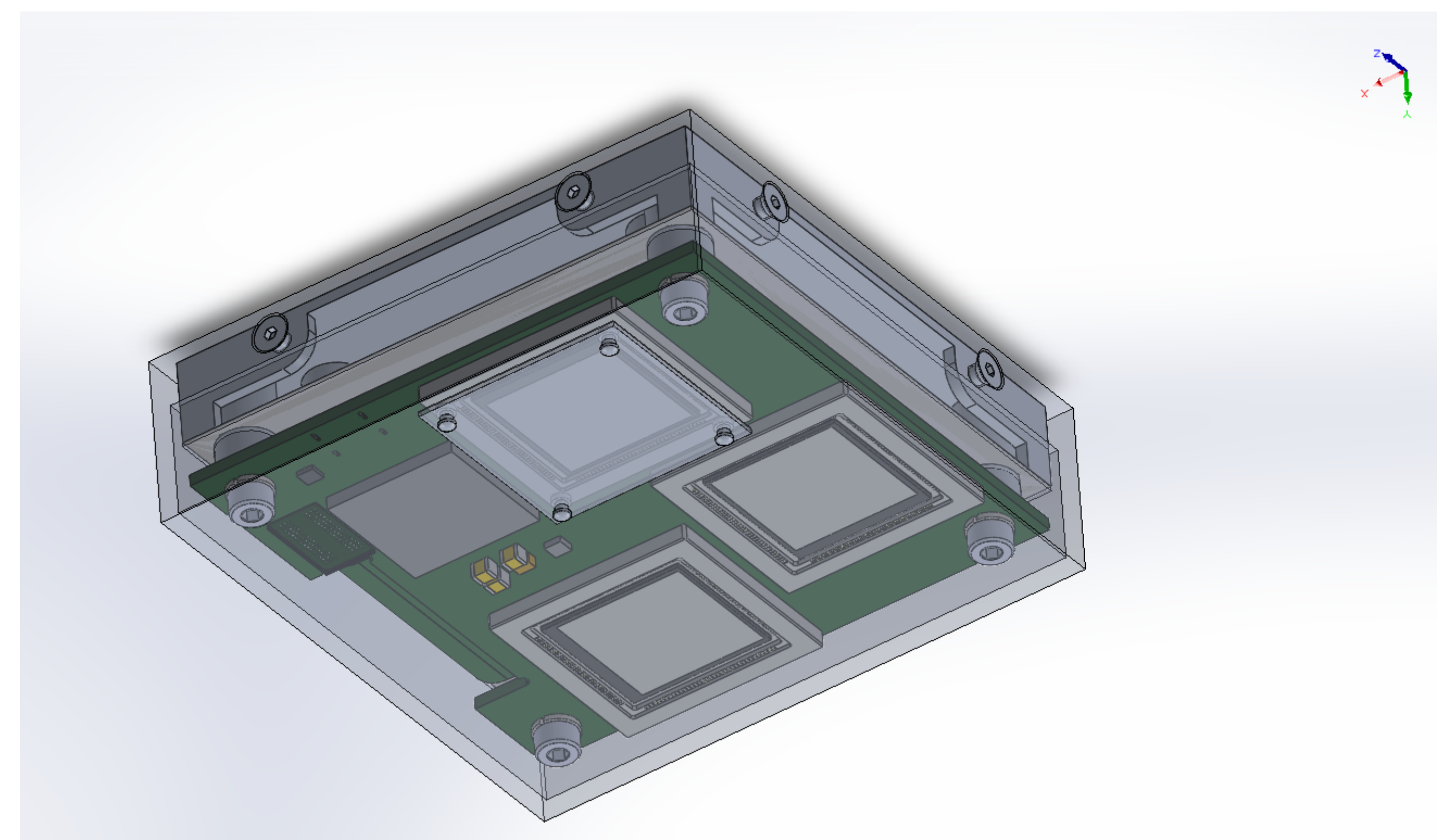
**NASA Neutron Spectrometer System**







## Astrobotic Cuberover Puli Lunar Water Snooper

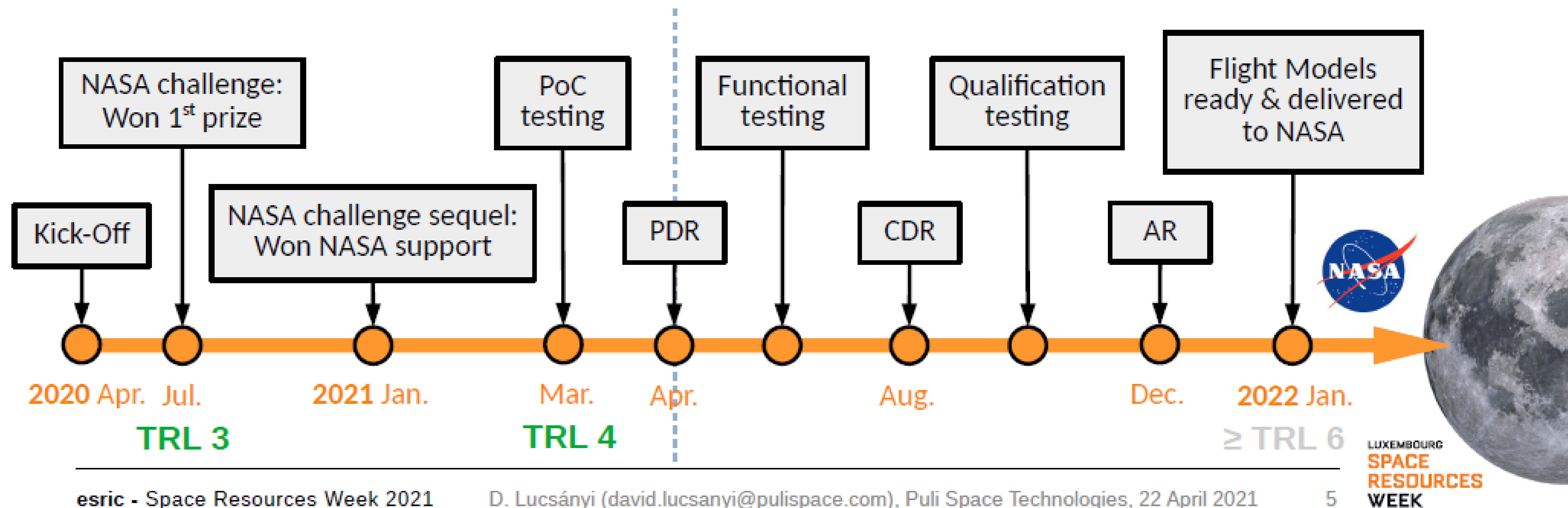


## Nagyfelbontású vízjég-térképek a Holdon



## PLWS payload timeline

- “Honey, I Shrunk the NASA Payload!” challenges by NASA & hero<sup>x</sup>
- **Goal:** 3 working, flight-ready “prototypes” are delivered to NASA JPL in January 2022







## „Proof-of-concept”

Neutron „érzékeny” réteg

CMOS szenzoron

- 2021 február

Sikeres mérés

CERN

- 2021 március

## „A puding próbája”

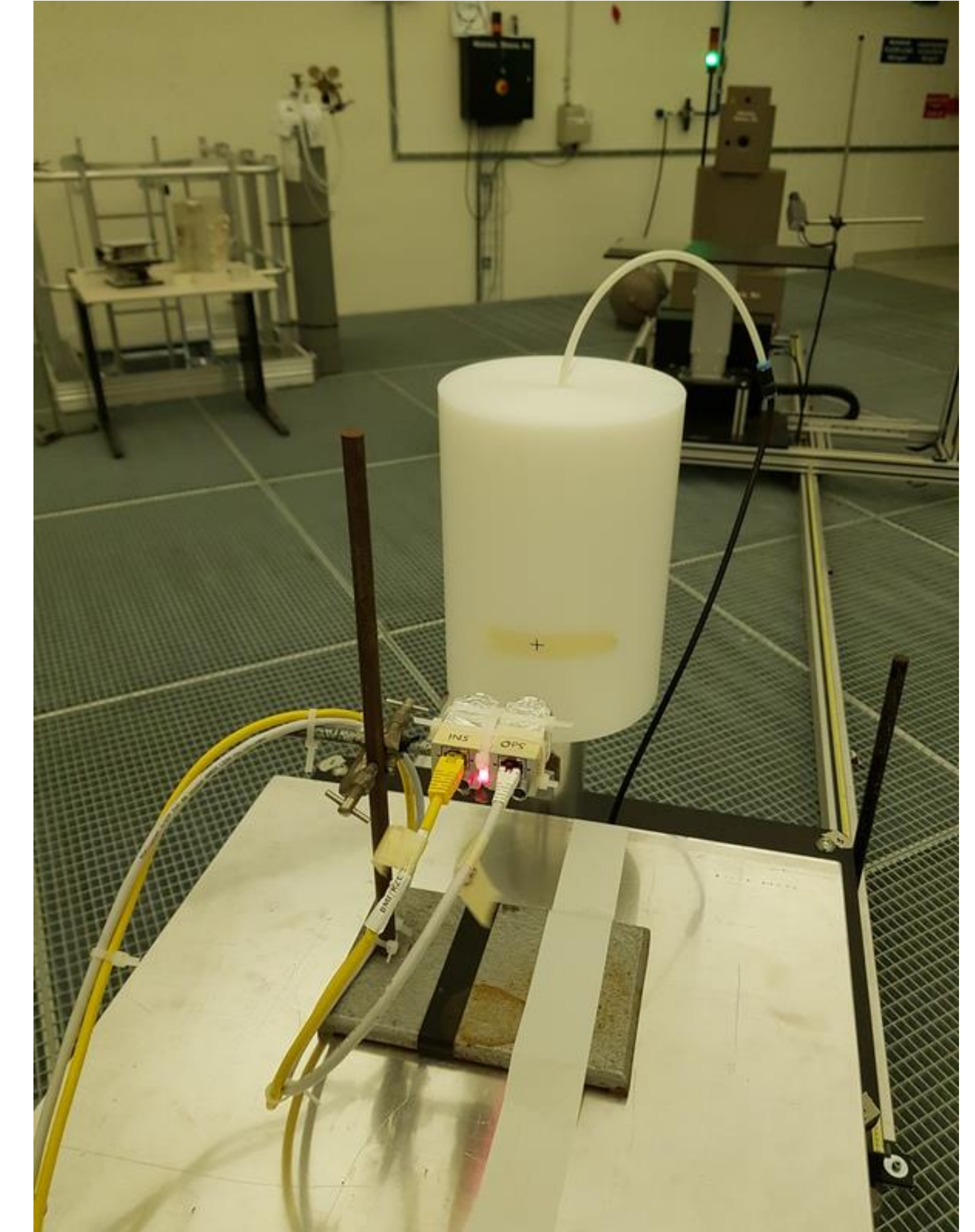
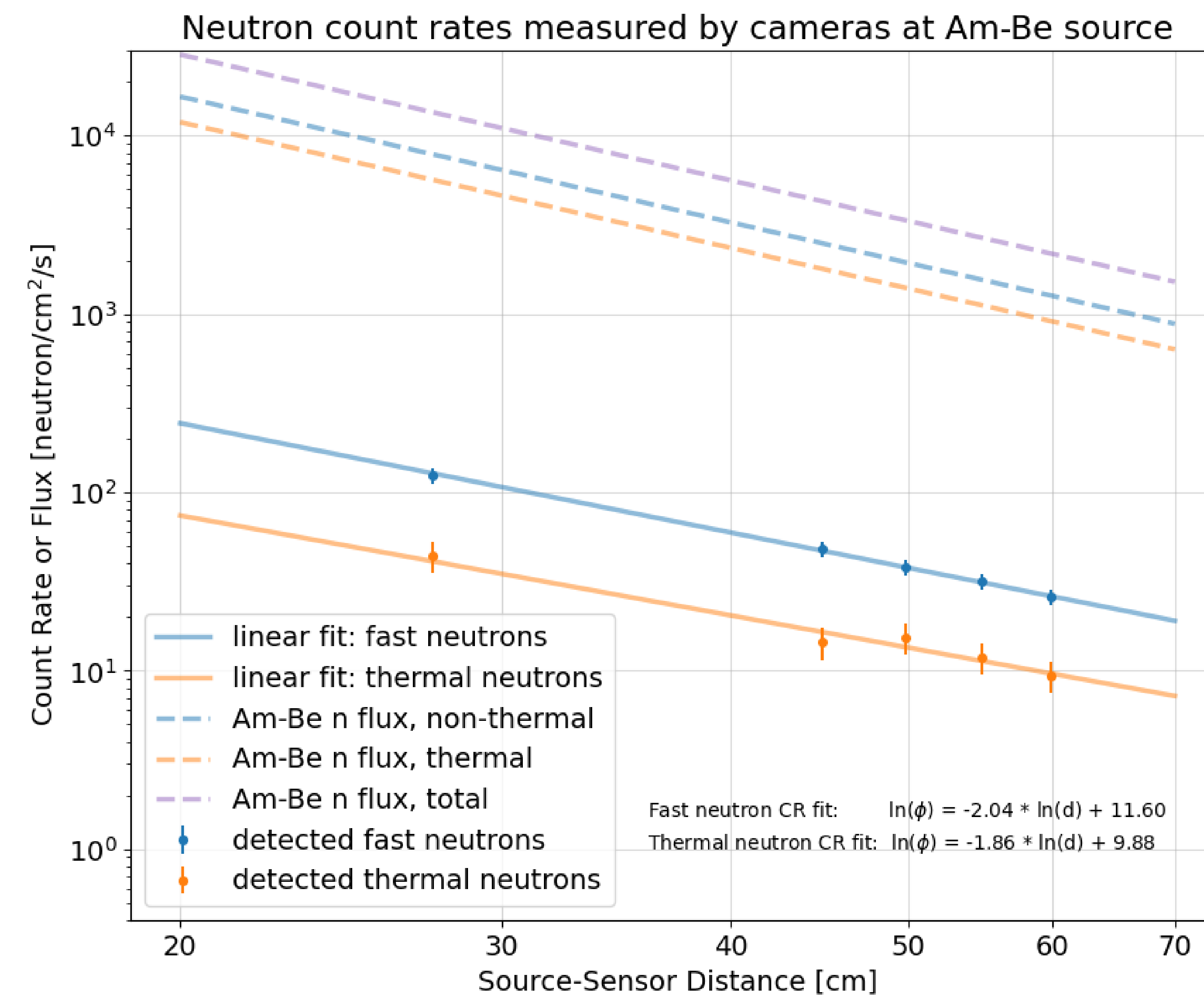
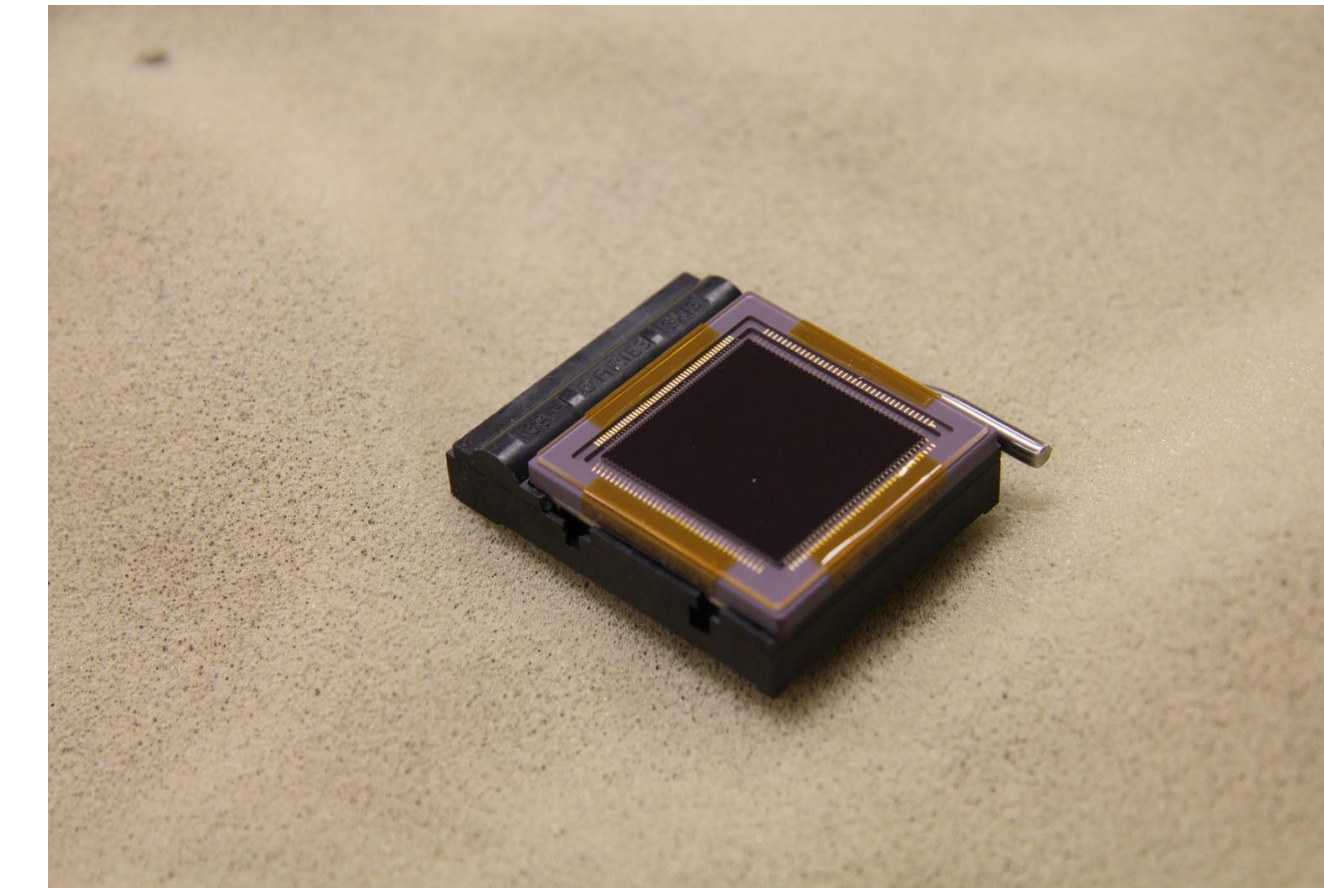
PDR JPL/NASA

- 2021 május 6.

Mérnöki modell előkészítése

& gyártása

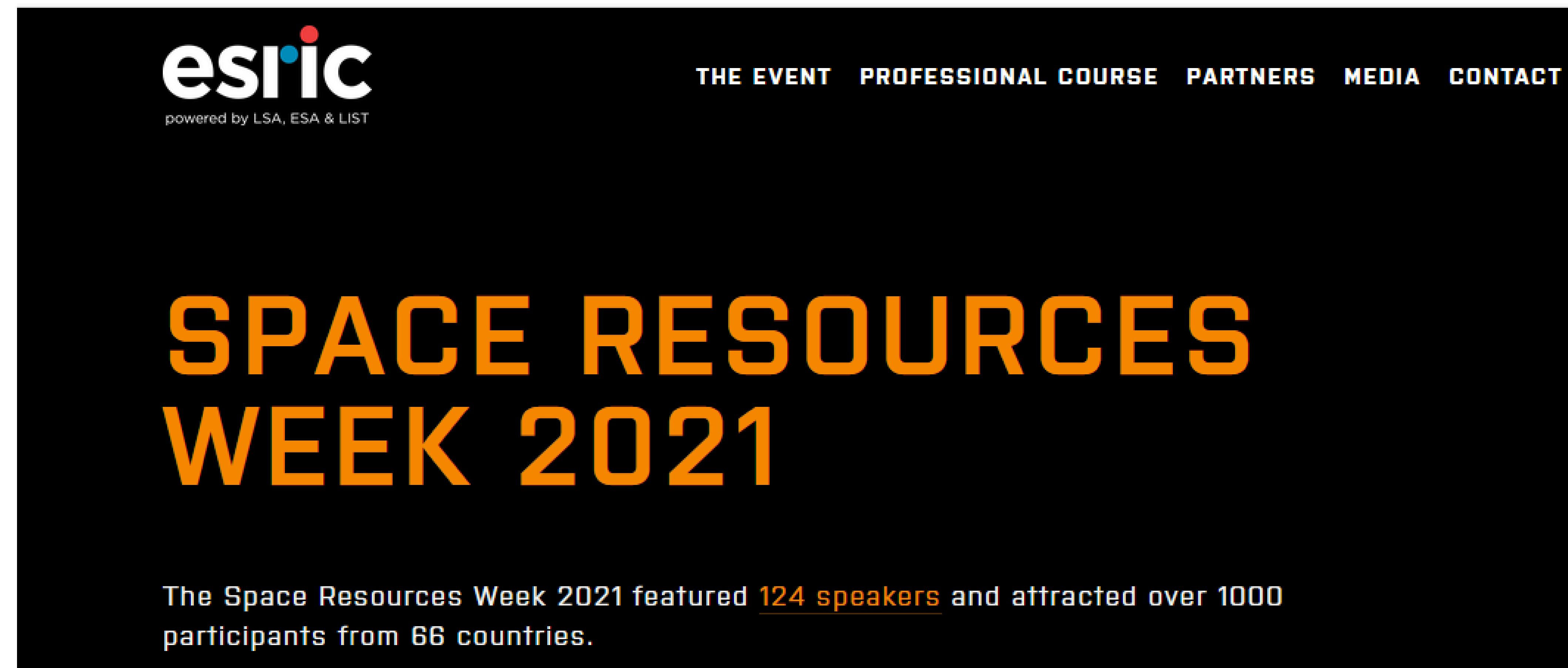
- jelenleg



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## SPACE RESOURCES WEEK 2021

The Space Resources Week 2021 featured **124 speakers** and attracted over 1000 participants from 66 countries.



ESA and ESRIC are looking for new technologies to tackle the first stage of planetary exploration: **PROSPECTING**

**CHALLENGE**  
ESA-ESRIC SPACE RESOURCES

Submission deadline: July 31st 2021



**Lunar Surface Innovation CONSORTIUM**

Administered by the **APL** JOHNS HOPKINS APPLIED PHYSICS LABORATORY



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The first program in the world focused on educating scientists, engineers, economists, entrepreneurs, and policy makers in the developing field of space resources.



**LSA** LUXEMBOURG SPACE AGENCY

15 - 17 APR 2021  
LUXEMBOURG

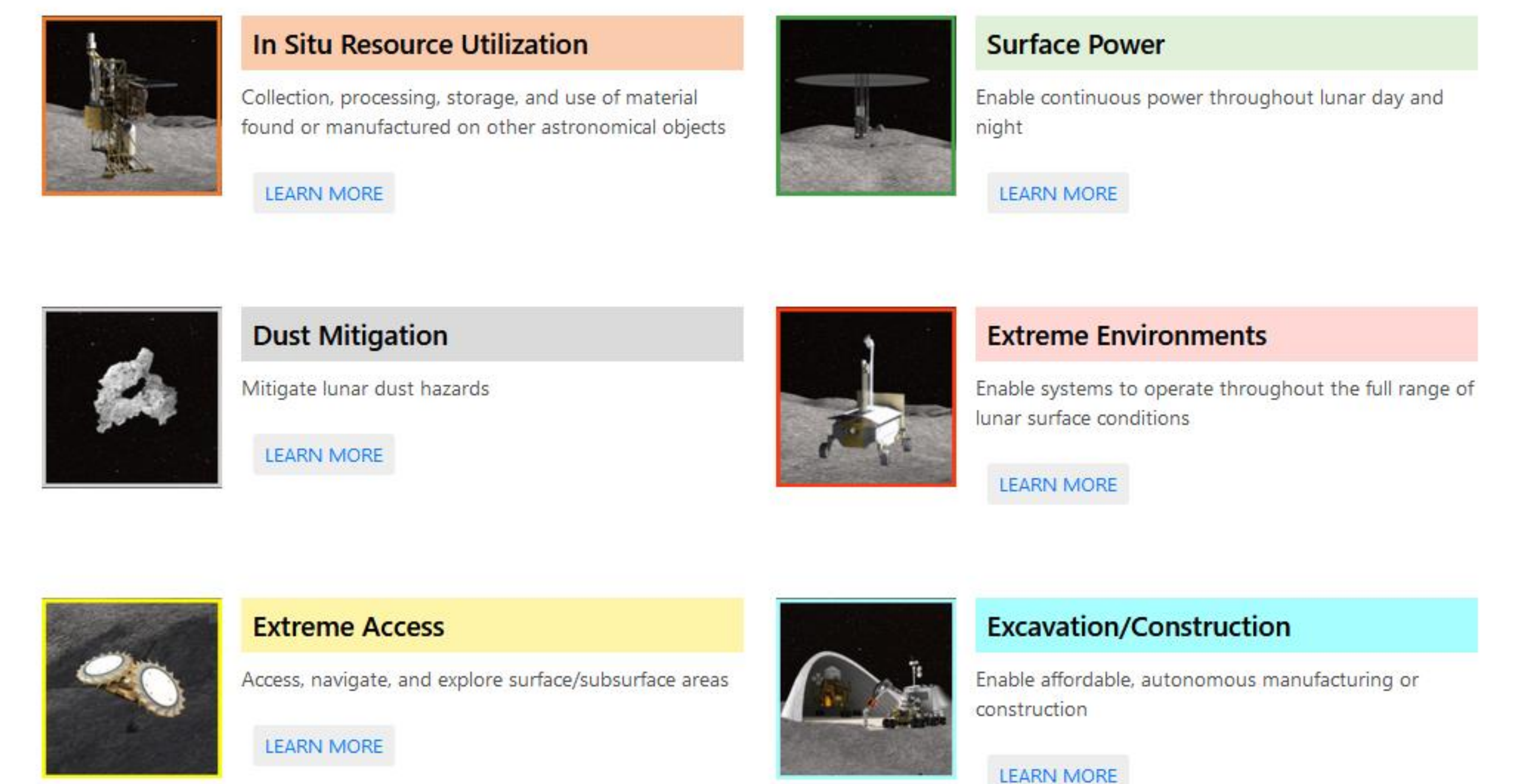
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**MINES** COLORADO SCHOOL OF MINES



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 <b>Dust Mitigation</b> Mitigate lunar dust hazards <a href="#">LEARN MORE</a>	 <b>Extreme Environments</b> Enable systems to operate throughout the full range of lunar surface conditions <a href="#">LEARN MORE</a>
 <b>Extreme Access</b> Access, navigate, and explore surface/subsurface areas <a href="#">LEARN MORE</a>	 <b>Excavation/Construction</b> Enable affordable, autonomous manufacturing or construction <a href="#">LEARN MORE</a>



## NASA CLPS program

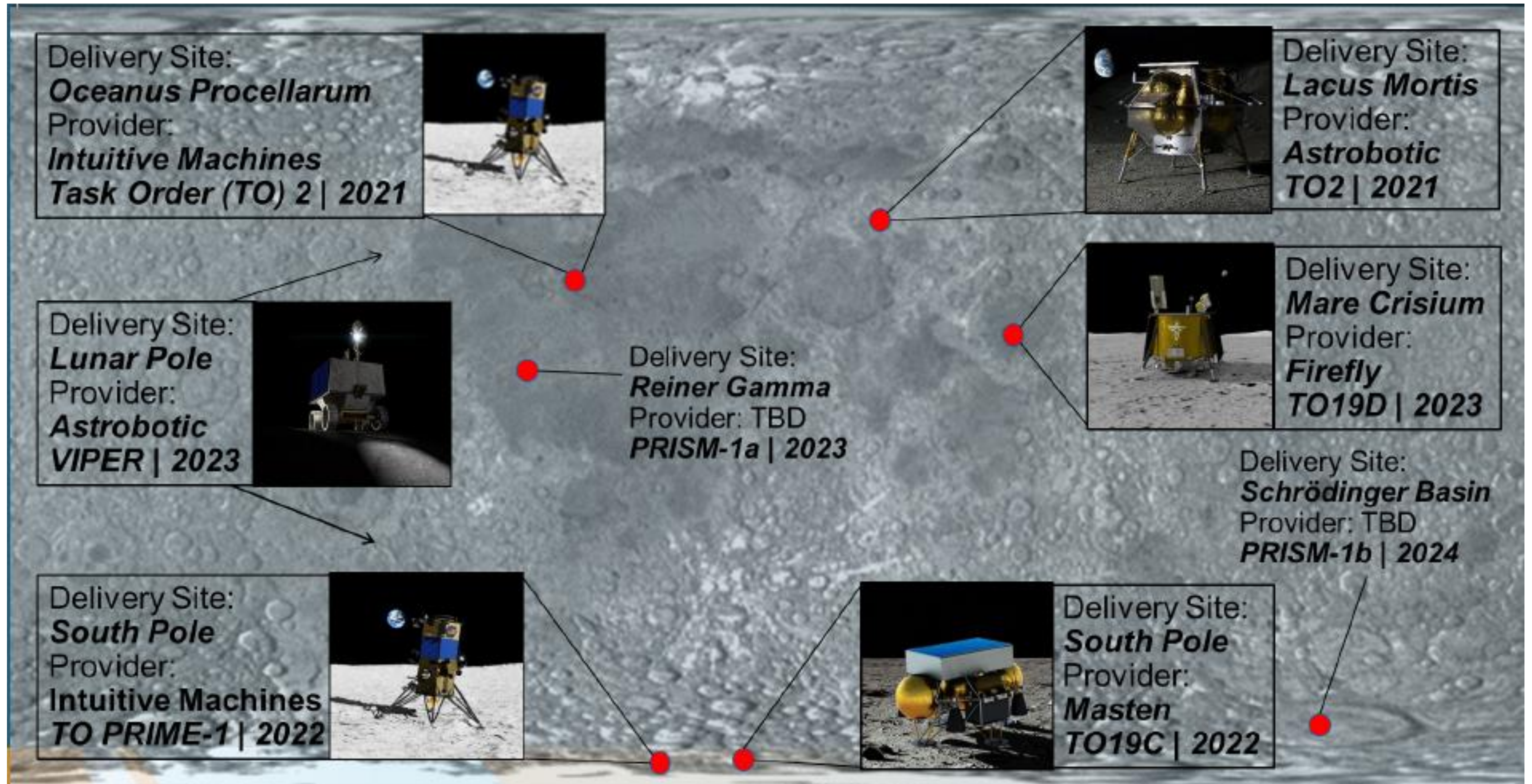
- 14 aspiráns
- 2,6 milliárd dollár
- évi 2 küldetés



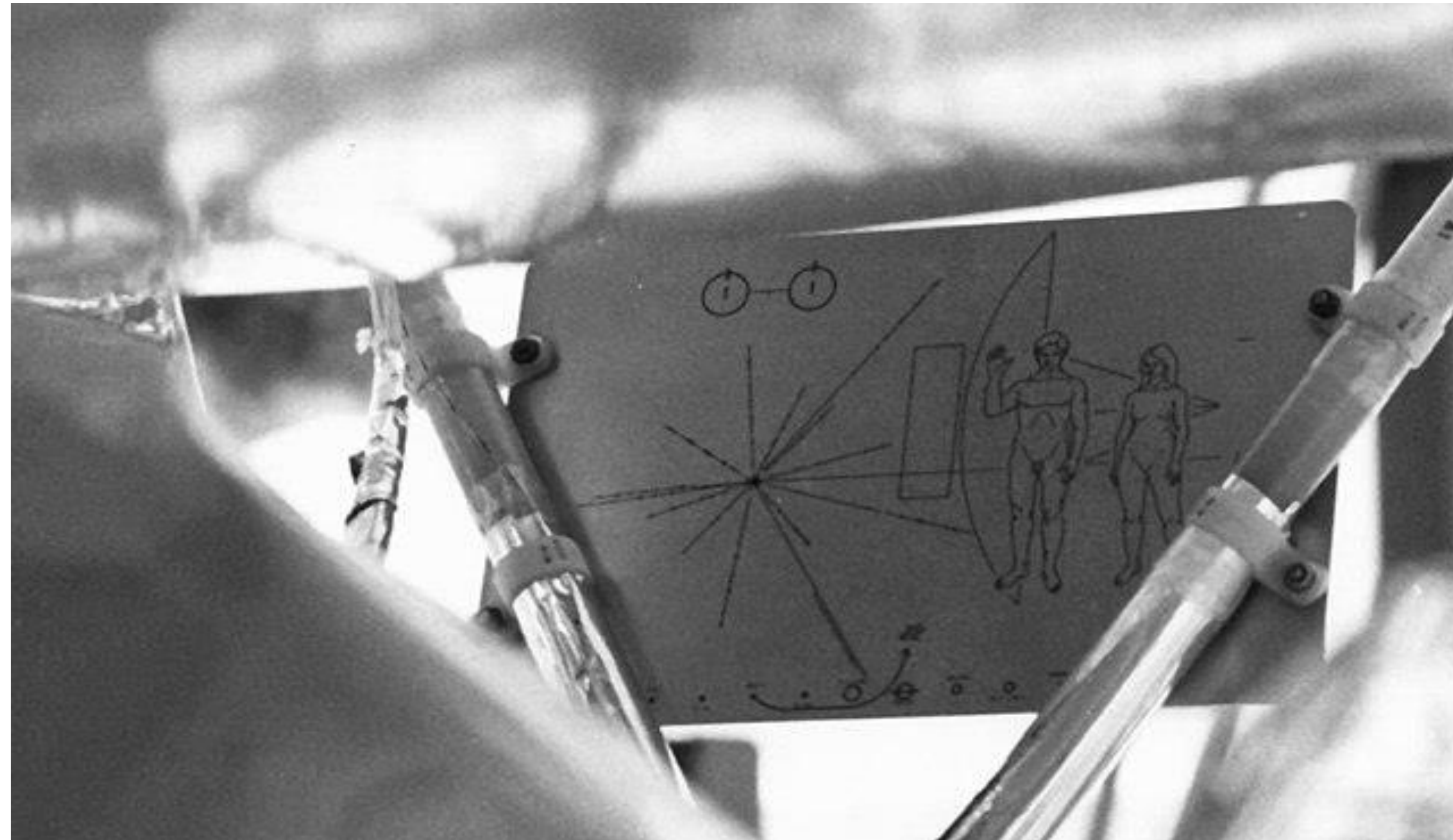


## NASA CLPS program

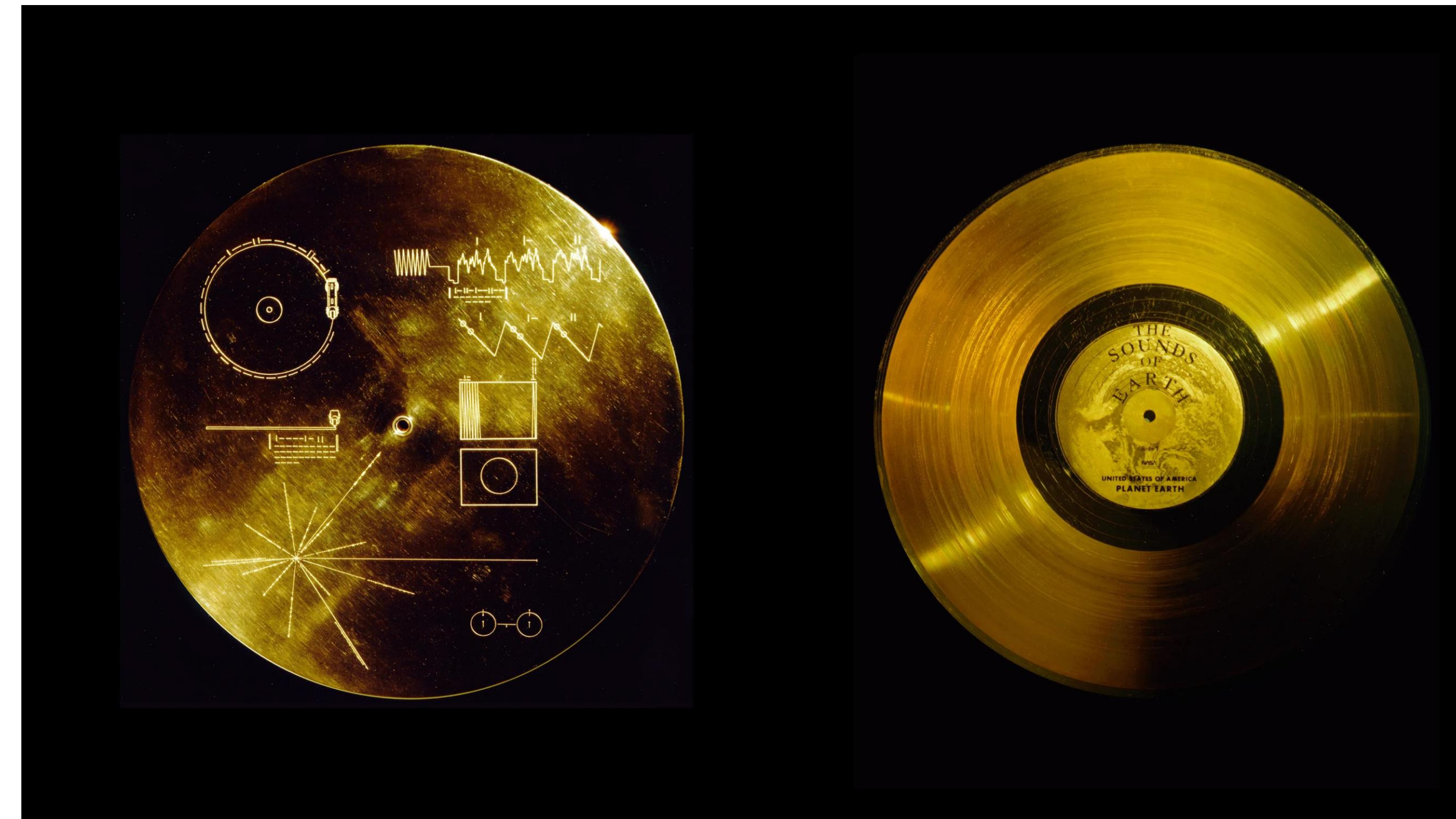
- 14 aspiráns
- 6 + 2 küldetés
- 2021-2024 között



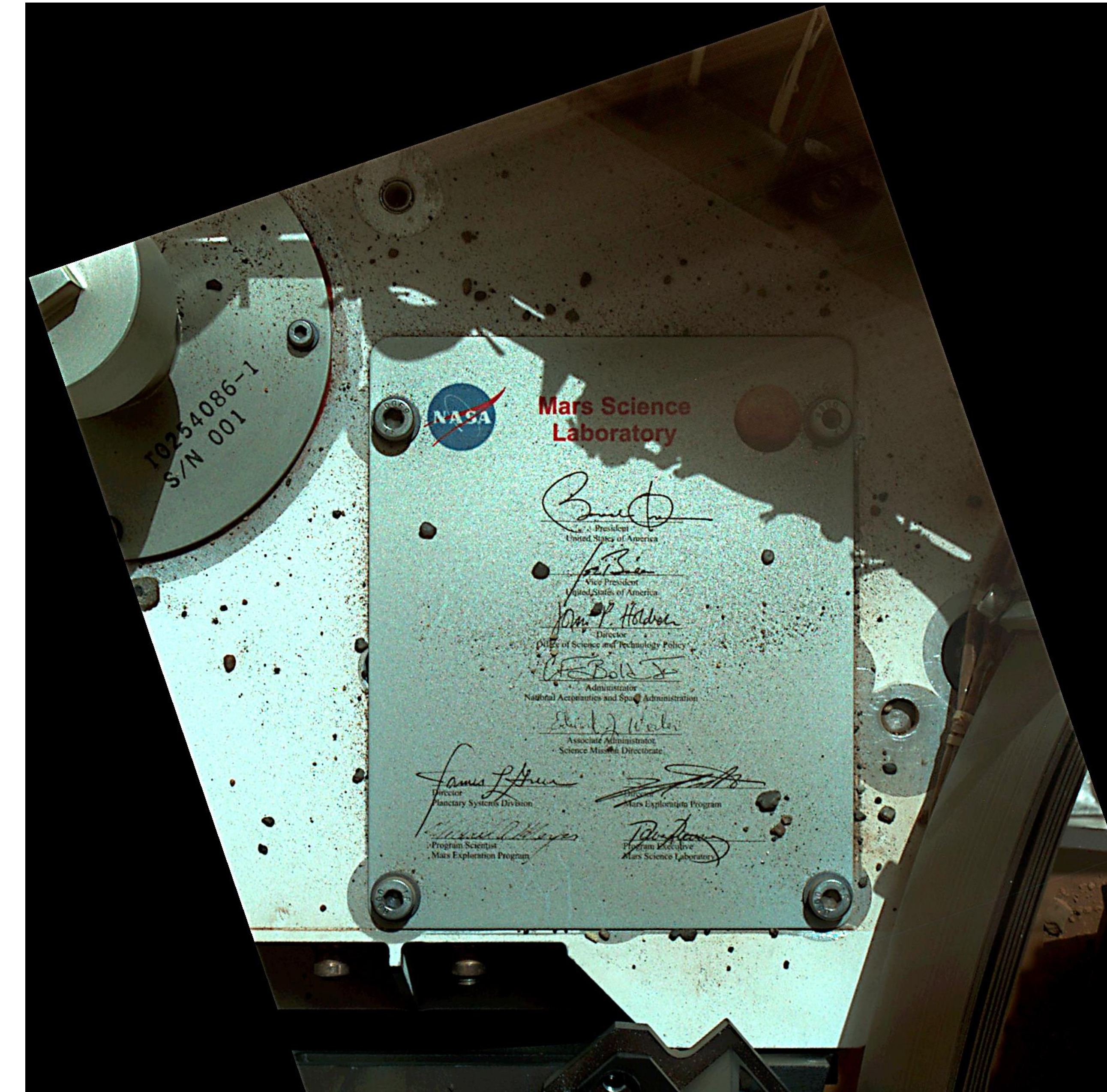




## Pioneer táblák



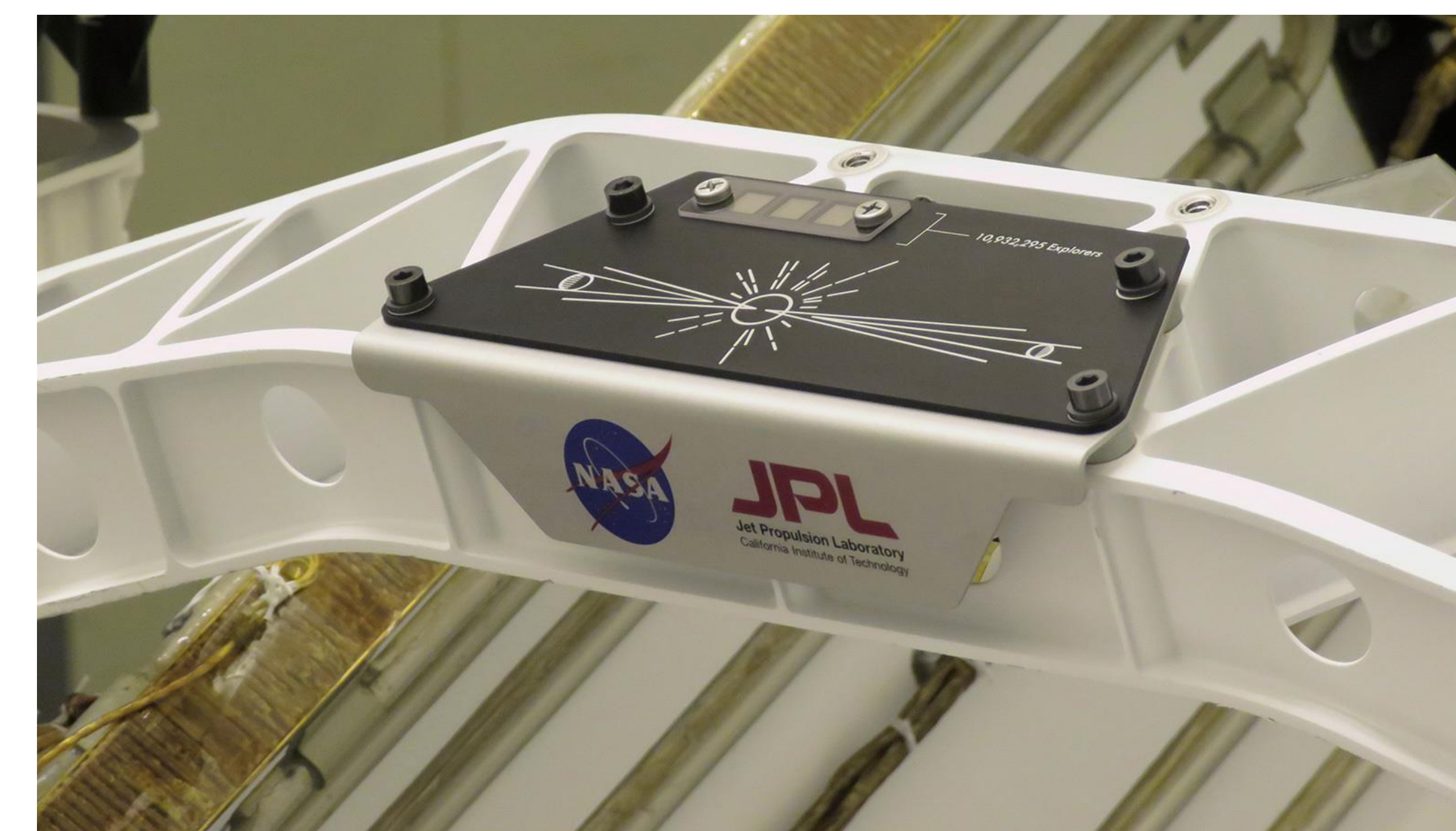
## Voyager arany- lemezek



## Nevek és aláírások a Marson Curiosity

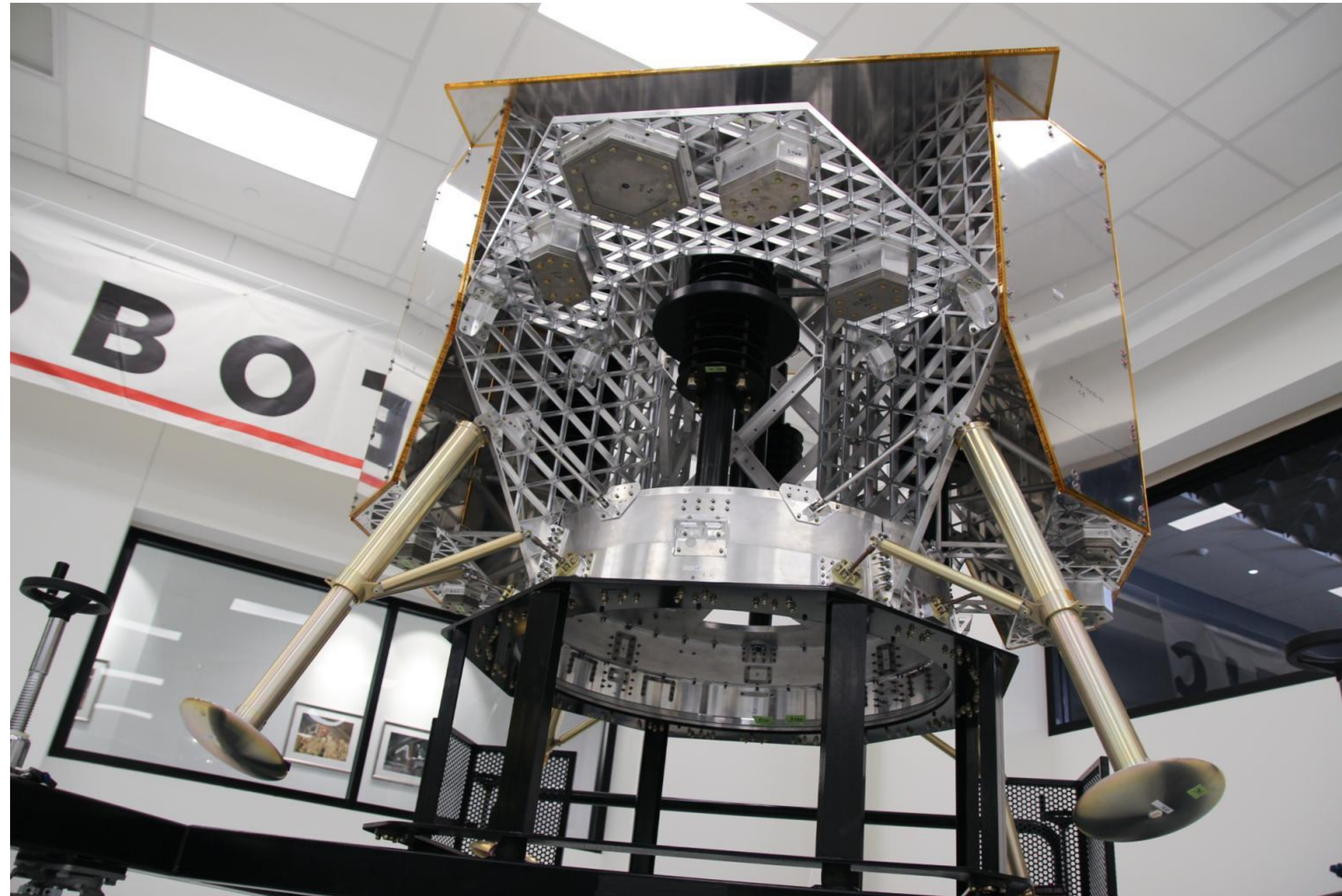


## Apolló plakettek

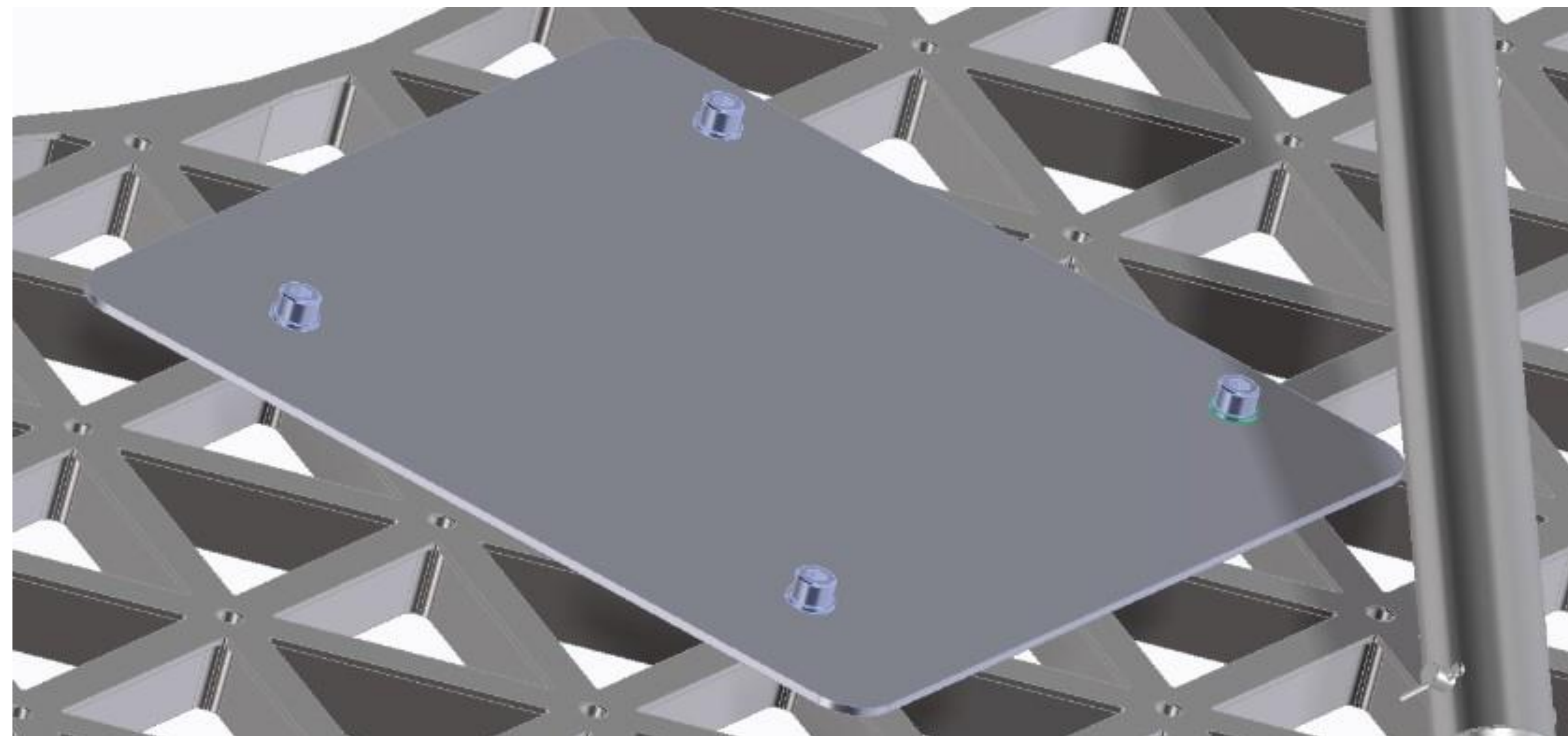
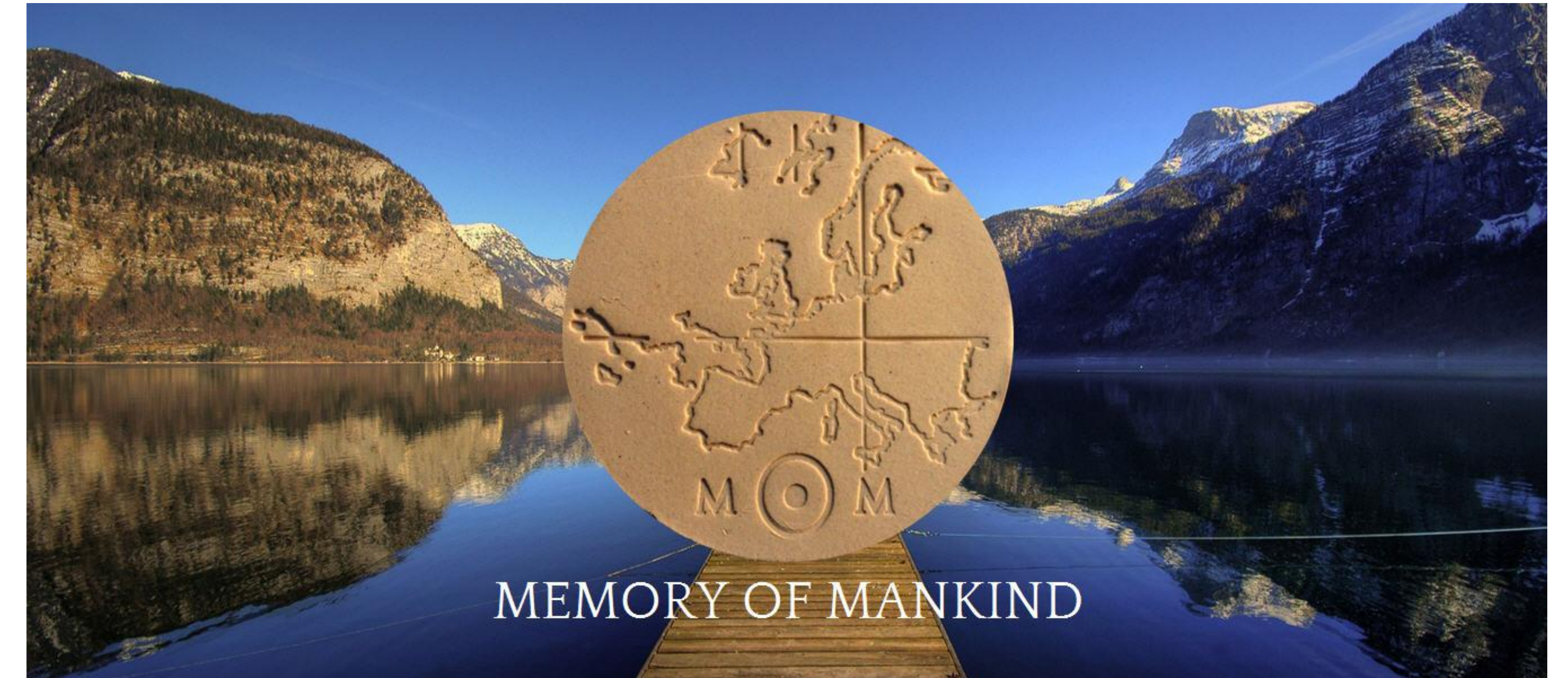


## Perseverance





**Peregrine  
- Astrobotic**



**Lacus  
Mortis**

**Hallstatt**

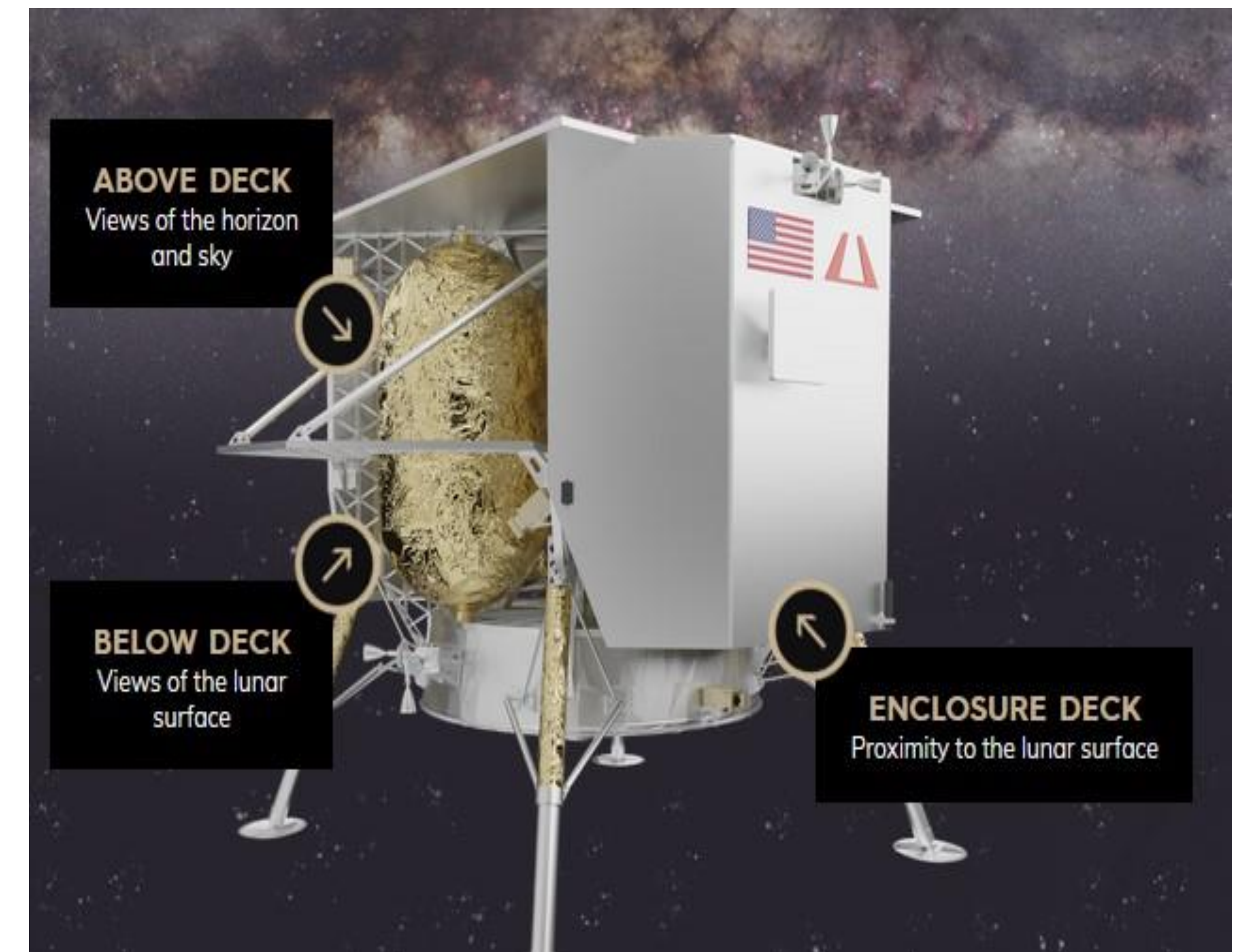
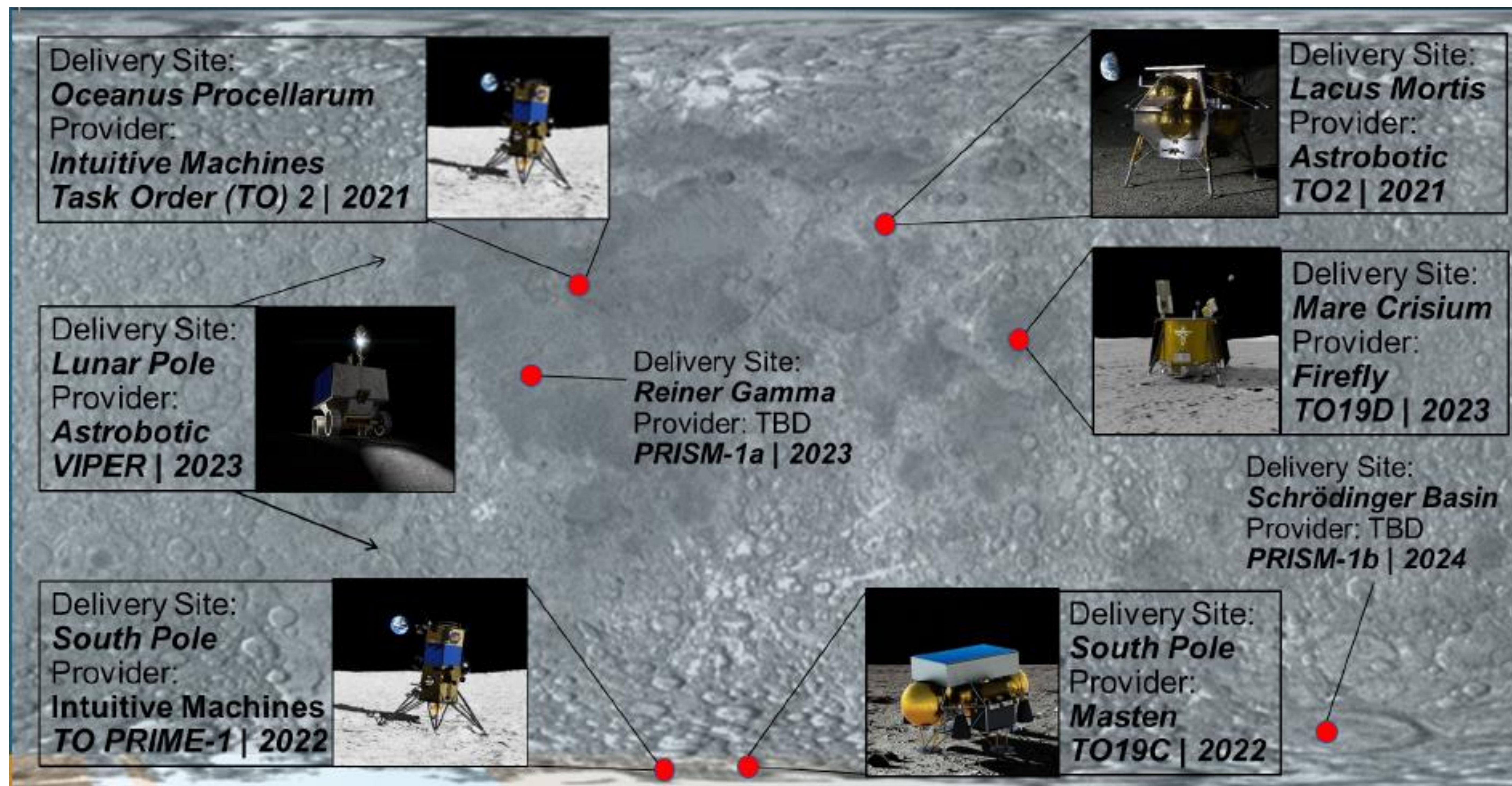




**Puli Rover – 2023-24 ?**

**Puli Lunar Water Snooper – 2023 – Reiner Gamma / Schrödinger Basin ?**

**Puli Térítő Plakett – 2021 – Lacus Mortis**







**Köszönöm a figyelmet!**

HTE 2021-05-12

