



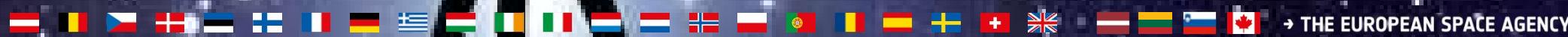
# A Moon Village Future

Jan Wörner, President acatech





# SPACE 1.0: Astronomy





LIFE John Glenn's Personal Album  
MAKING OF A BRAVE MAN



Alexei Leonov

## SPACE 2.0: Race in Space



Lunochod



Ham



Laika





October 24th, 1963  
Félicette  
210 miles above Earth



# Space cat esa back alive

PARIS, Saturday. — France has successfully sent a cat into space on board a Véronique rocket and brought it back to earth alive.

An Avion France Marconi spokesman said the flight was made from Bourges, about 100 miles from Paris.

The cat came down by parachute.

The spokesman said the top part of French President Charles de Gaulle's speech at a military school in which there were many dogs had been written.

Marconi said in the early bird round report to be transmitted to the international news agencies on the flight, the cat weighed 2.2 kg.

The cat was housed in a

box. French news photo wire says the cat had no trouble breathing or eating after its return to earth, and was returned to its home where it was found to be healthy.

By taking a cat, the spokesman said, the mission was to explore an animal's reactions under circumstances and not to carry out any specific biological experiments on the animal.

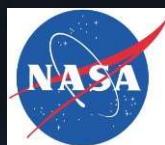
## A DOUBLE FRACTURE



European Space Agency



# SPACE 3.0: Steps for global cooperation and space applications



European Space Agency

# Shift of paradigms!

Change of

- Motivations
- Actors
- Contents
- Roles
- Technologies
- Space environment
- Commercialisation...
- Market development
- Global setup
- EU in space
- National activities

- New Space
- Internet of things
- spin in / spin off
- Participation
- Diversity
- Information
- Innovation
- Interaction
- Inspiration
- Cooperation
- Jobs & growth
- Digitalisation&AI

# Space: Bridge over Troubled Water



2014



European Space Agency

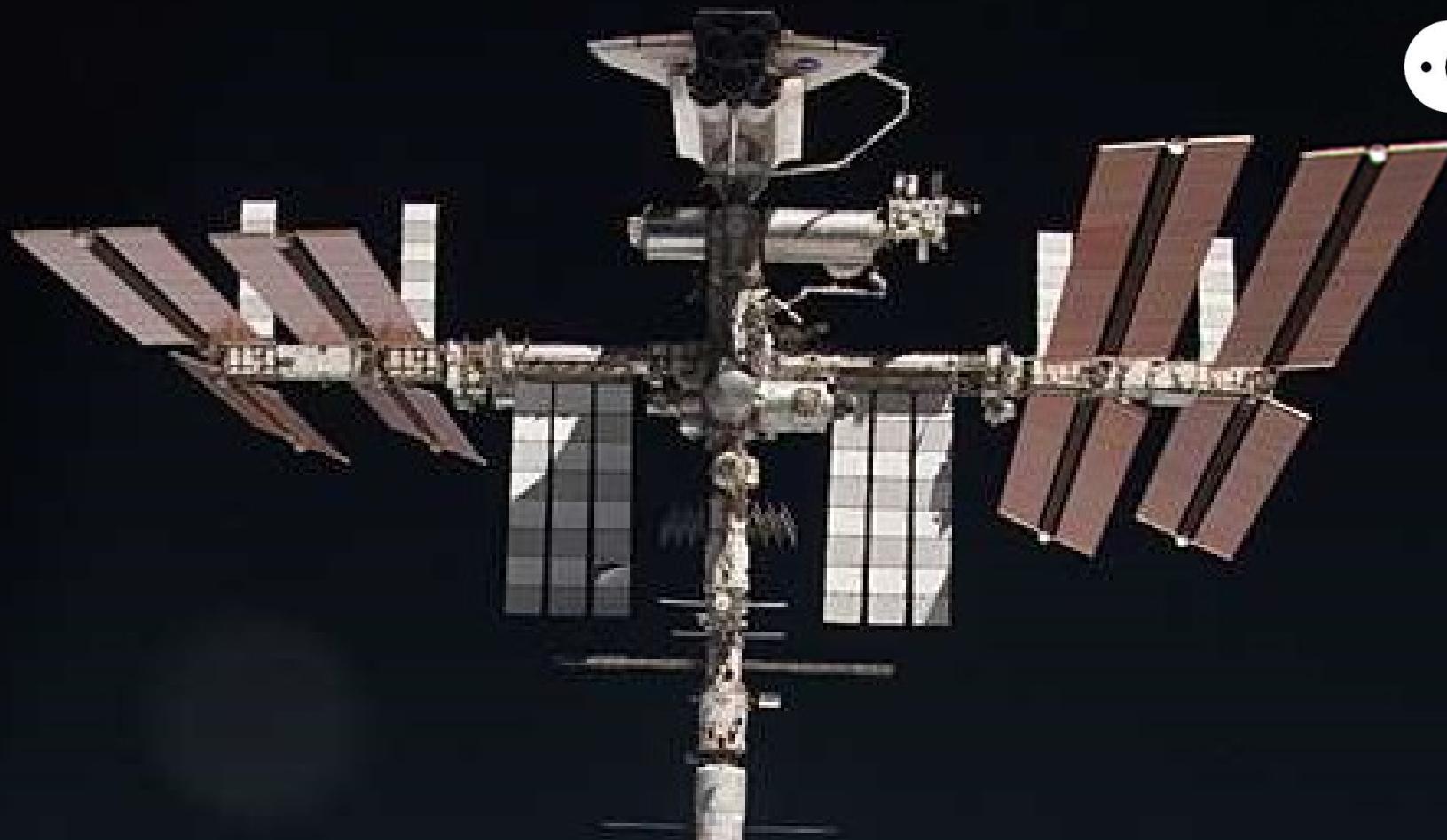
Alexander Gerst

Maxim Surajev

Reid Wisemann



European Space Agency



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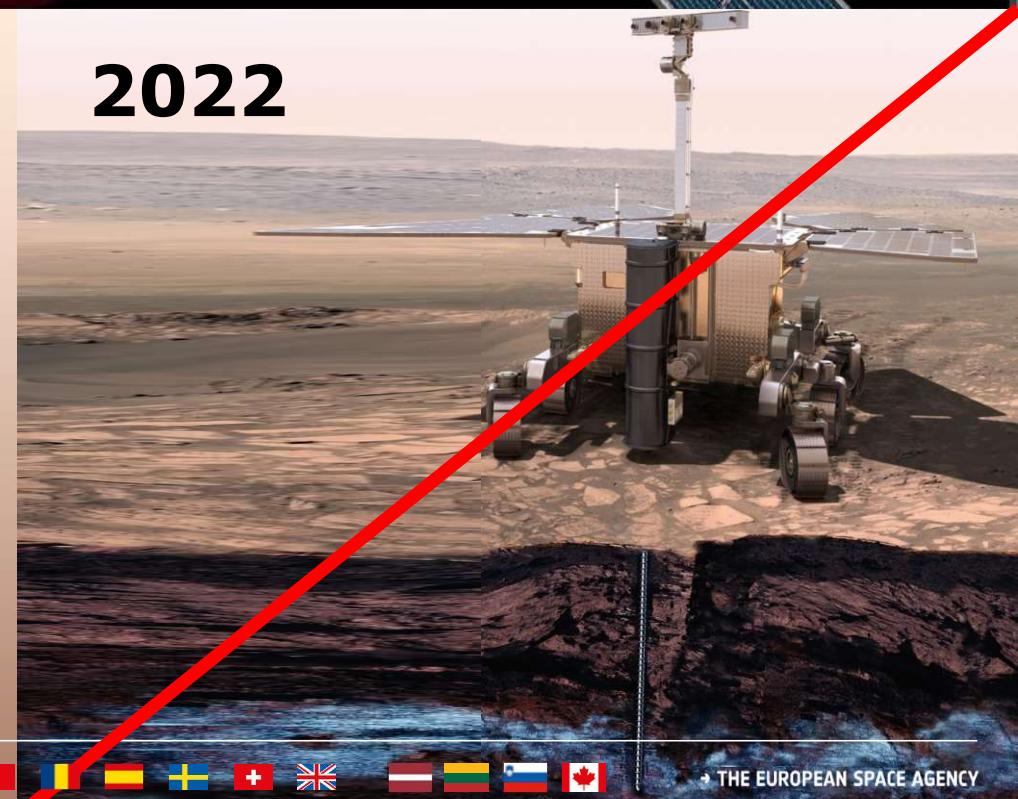
**2022**



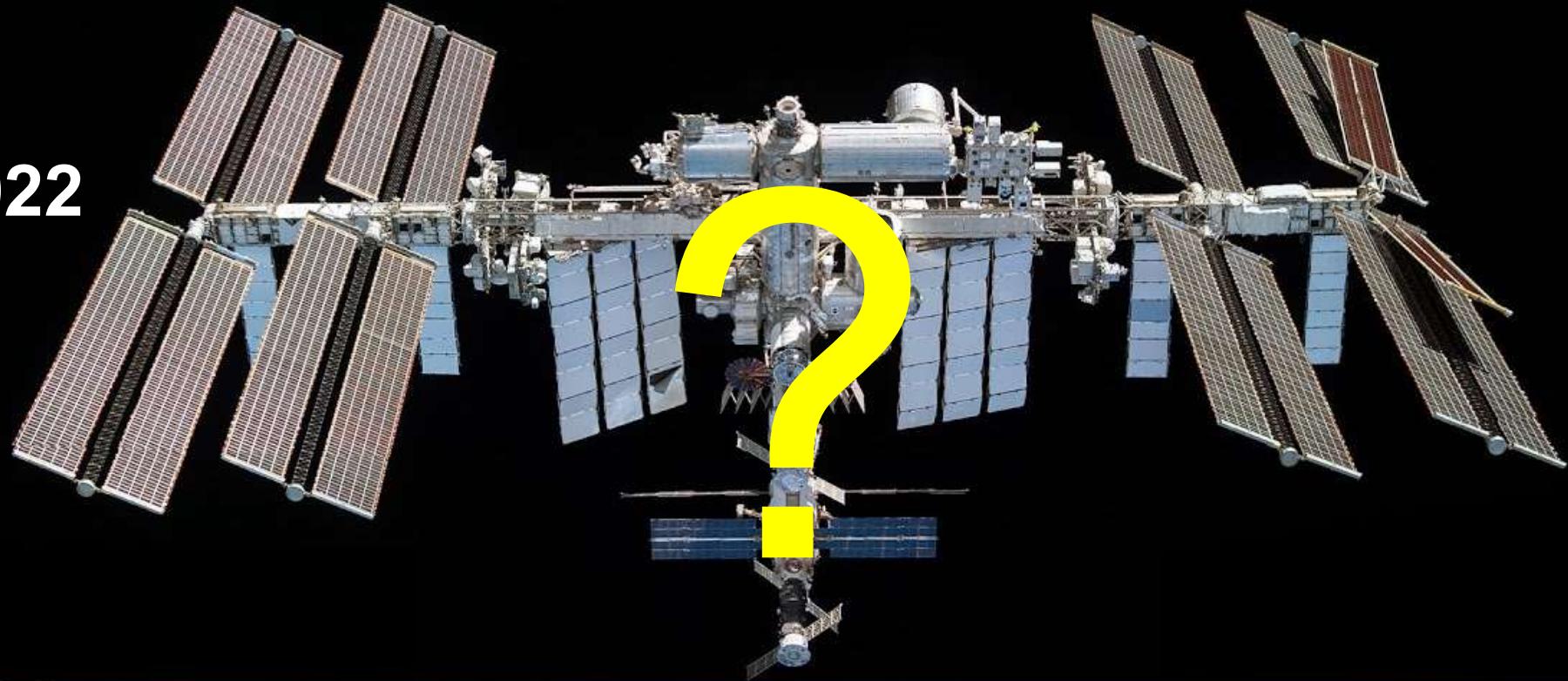
2016



2022

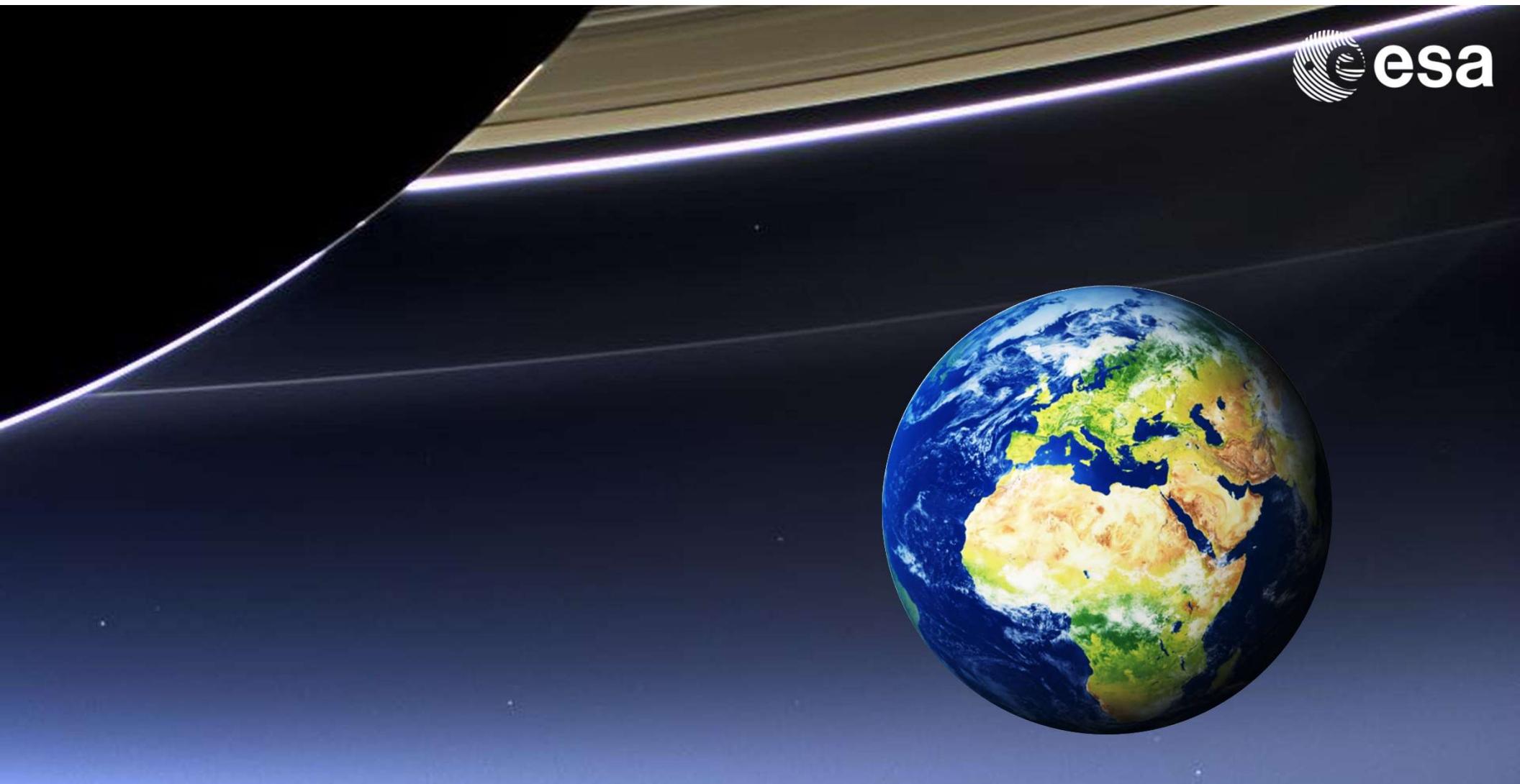


2022



**weLT**  
NACHRICHTENSENDER

**JETZT DROHT RUSSLAND MIT  
ISS-ABSTURZ - ÜBER DEN USA!**



→ THE EUROPEAN SPACE AGENCY

# Competition = driver



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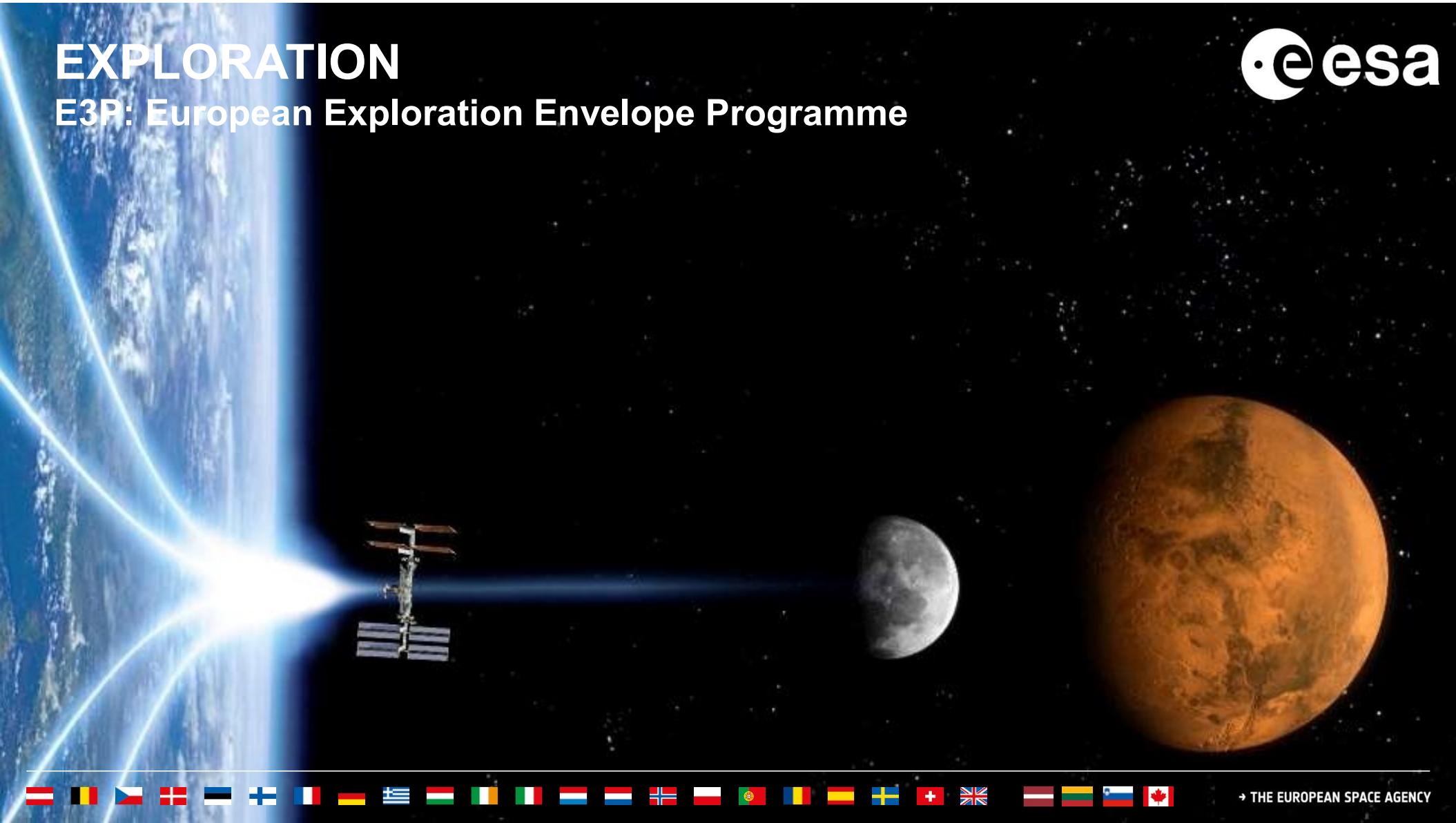
Cooperation = enabler



THE EUROPEAN SPACE AGENCY

# EXPLORATION

E3P: European Exploration Envelope Programme



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T. S. Eliot: „We will not cease from exploration  
until we come back to where we came from and  
see the place for the first time“



# Next destinations?



no “ultimate goal”

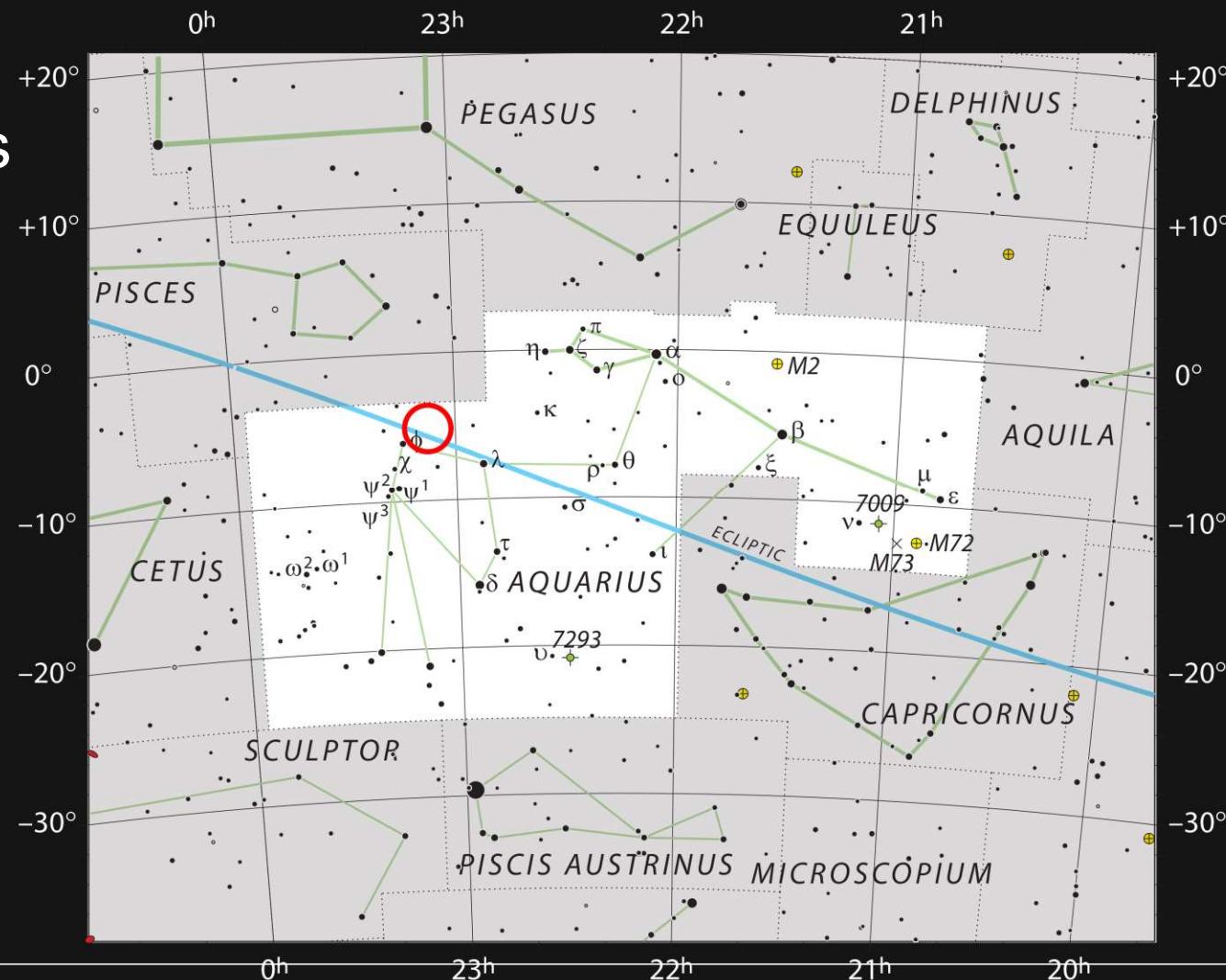
# **Stephen Hawking: Humans need to leave Earth or risk being annihilated by nuclear war or climate change**

---

Peter Kotecki Oct 18, 2018, 10:31 PM



# Trappist-1 39 light years



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# TRAPPIST-1 System



b

c

d

e

f

g

h



Illustration

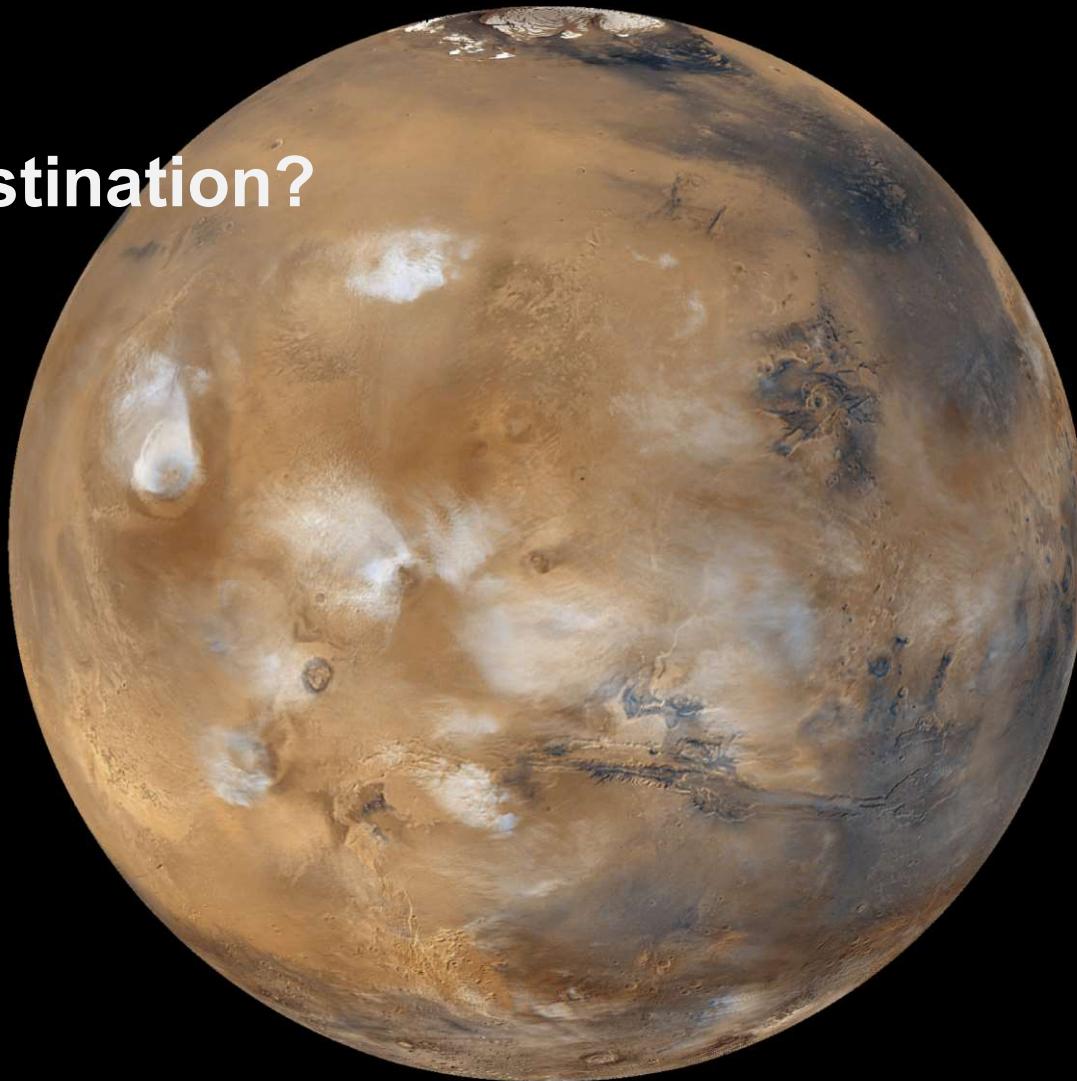
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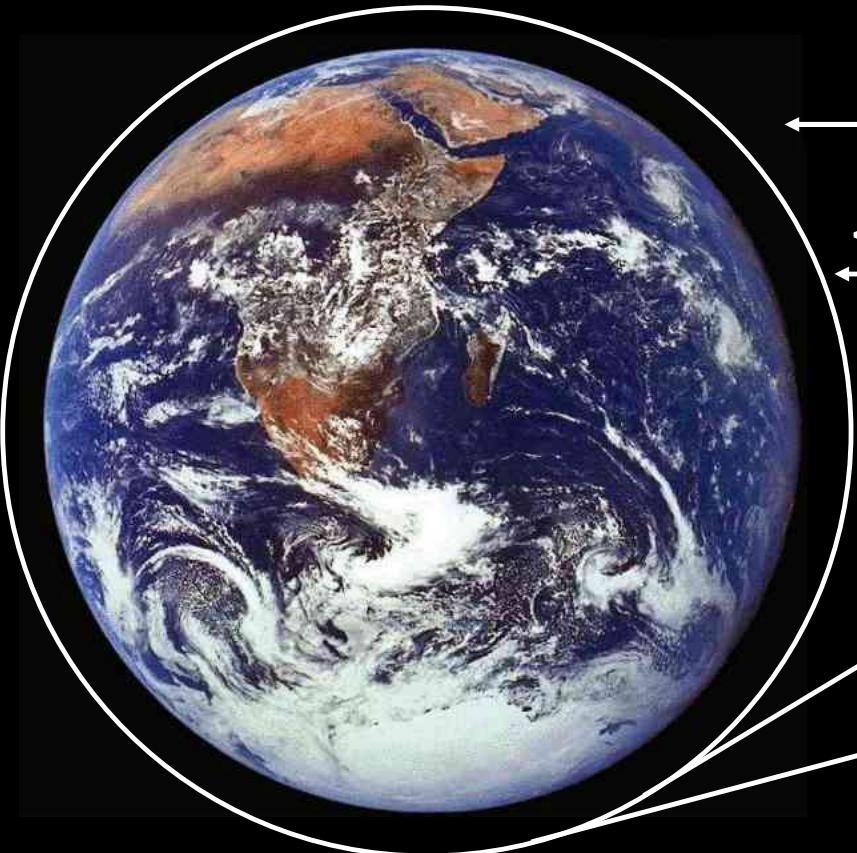
Music of Trappist-1...  
frequency\*212 million

Mars

The next destination?



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> 2 years

< 1 week



### Mars:

- propulsion
- safety/security
- health
- psychology
- radiation
- communication
- ...



## Human Settlement on Mars

Mars One will establish a permanent human settlement on Mars. Crews of four will depart every two years, starting in 2024. Our first unmanned mission will be launched in 2018. Join the Global Mars One Community and participate in our mission to Mars.

Support our Human Mission to Mars

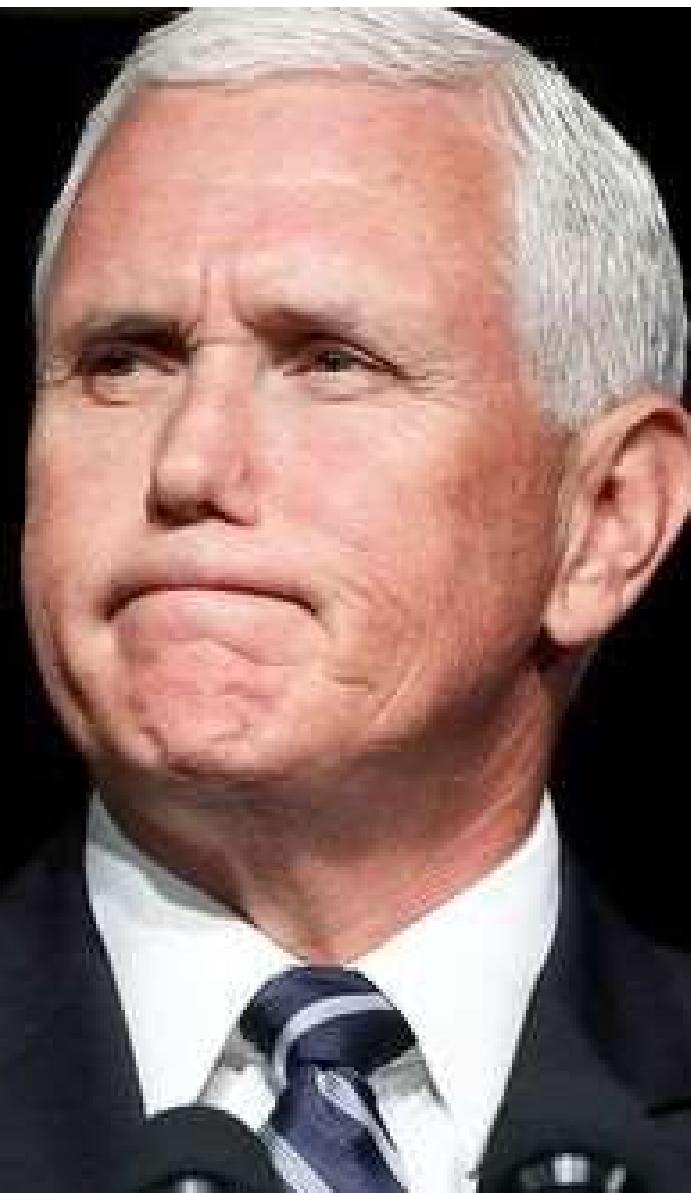


THE NEXT GIANT LEAP FOR MANKIND

2019



“Back to the Moon...”





# “Forward to the Moon!”



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Multi partner open concept



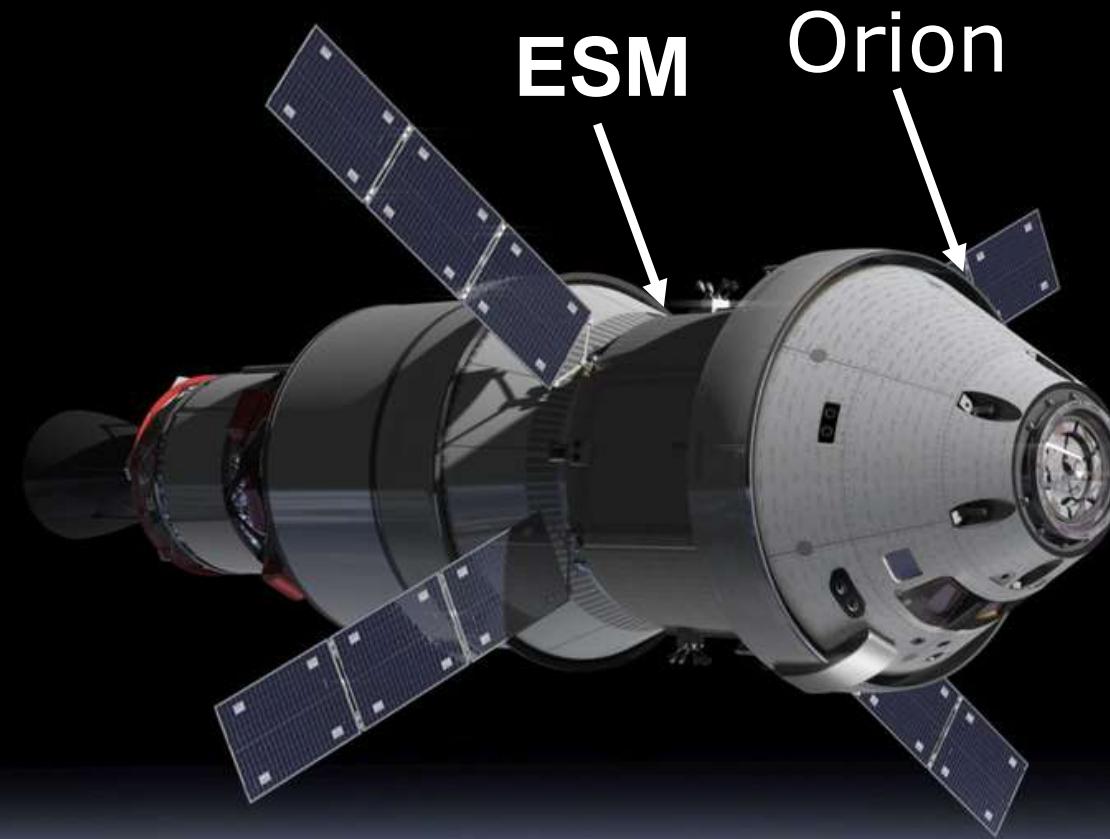
Moon village



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# Artemis 1

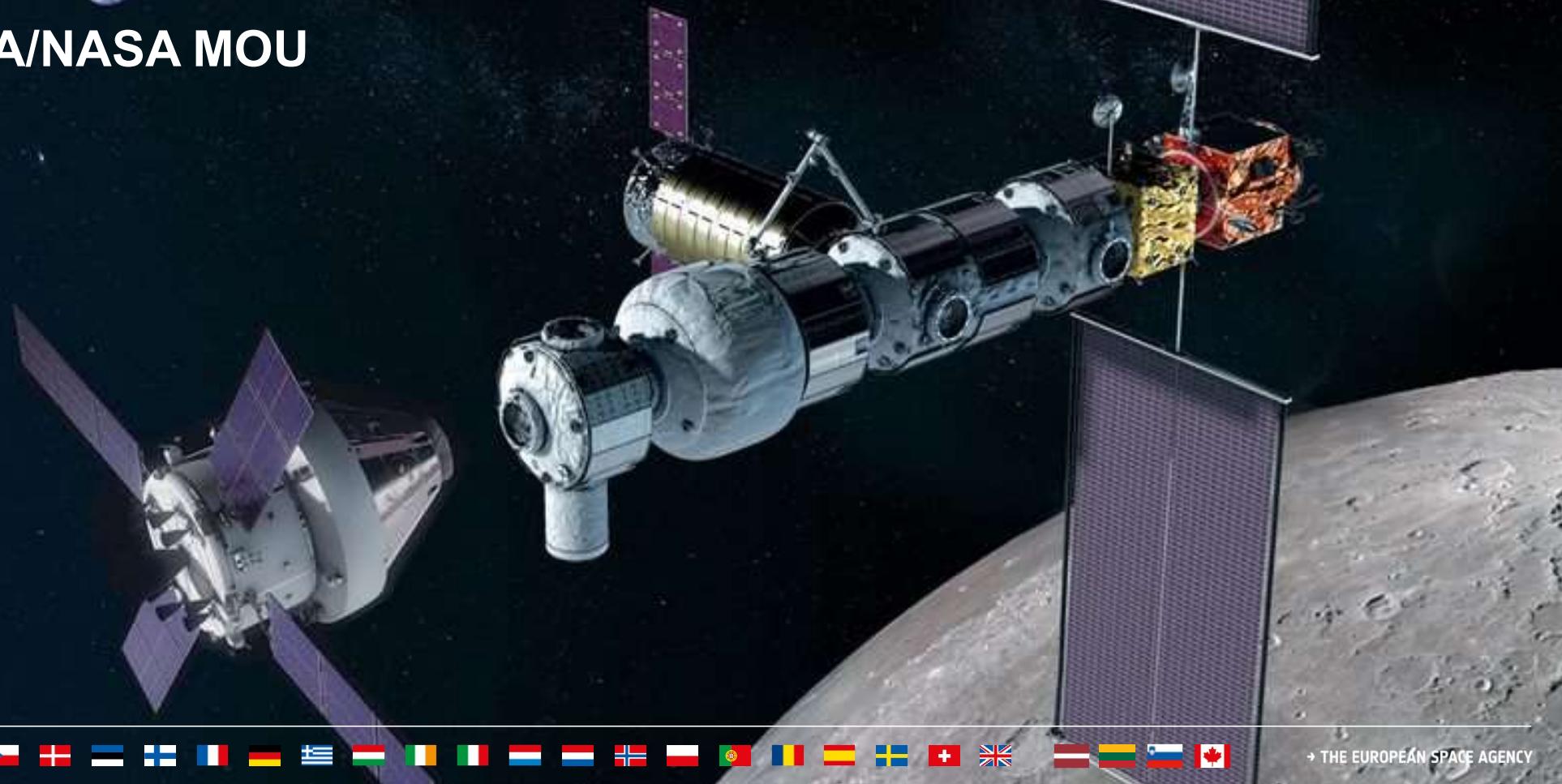




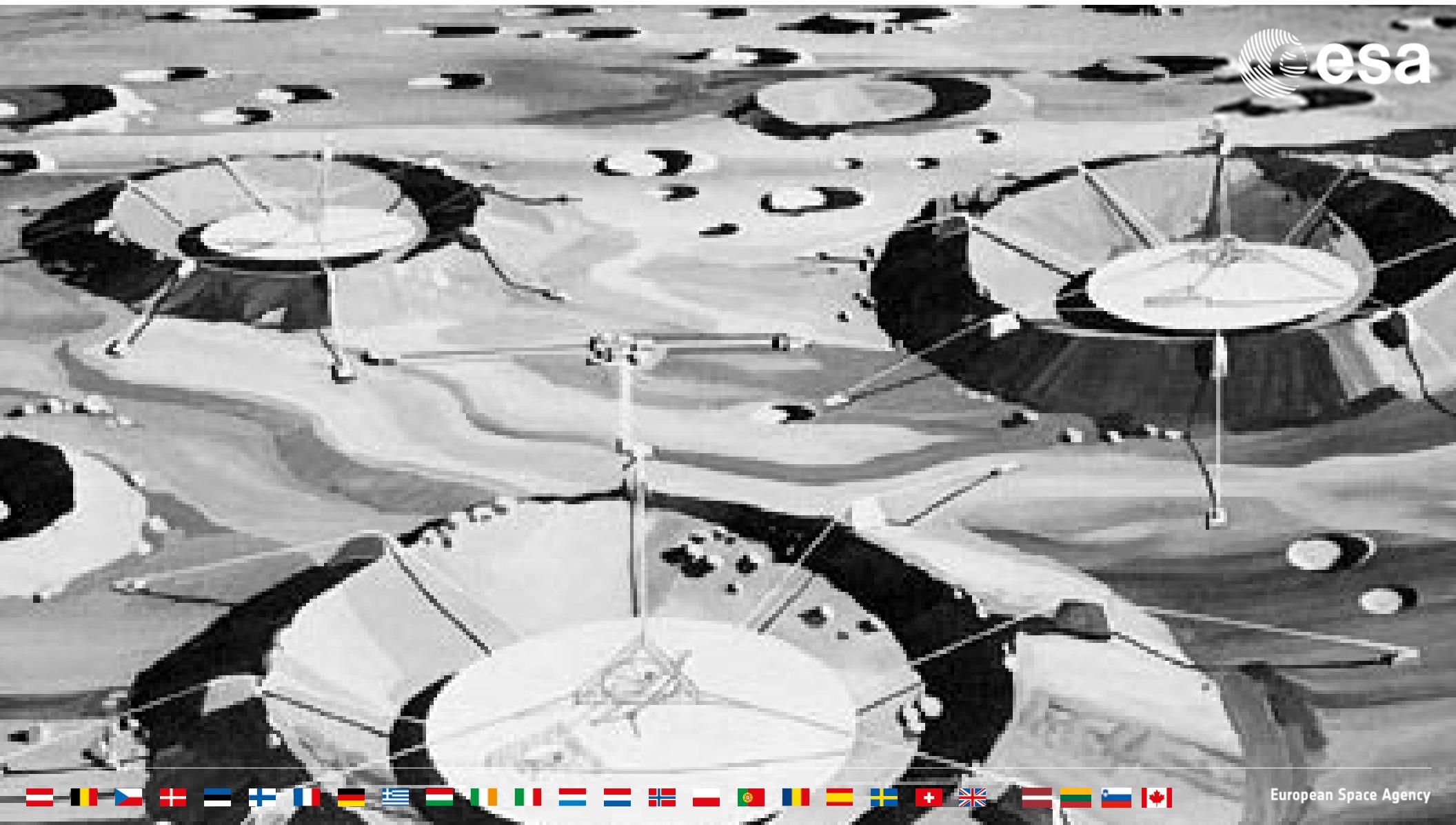
# Lunar Gateway



ESA/NASA MOU



THE EUROPEAN SPACE AGENCY

The European Space Agency logo, featuring a stylized globe composed of concentric ellipses next to the acronym "esa".

European Space Agency

# FORWARD TO THE MOON



European Space Agency

**GOONHILLY**  
EARTH STATION

**SURREY**  
SATELLITE TECHNOLOGY LTD

**esa**



European Space Agency

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Space & Science

# Jeff Bezos lays out his vision for city on the moon, complete with robots

BY ALAN BOYLE on May 20, 2017 at 5:42 pm

[529 Comments](#)  [Share 1.2k](#)  [Tweet](#)  [Share 550](#)  [Reddit](#)  [Email](#)



Artist's concept shows Blue Origin's Blue Moon lander on the lunar surface. (Blue Origin Illustration)





elonmusk

Follow



207.9k likes 2,072 comments

Moon Base Alpha



29 September 2017



@themoonhouse



European Space Agency

# Roles of Public Side (Governments)

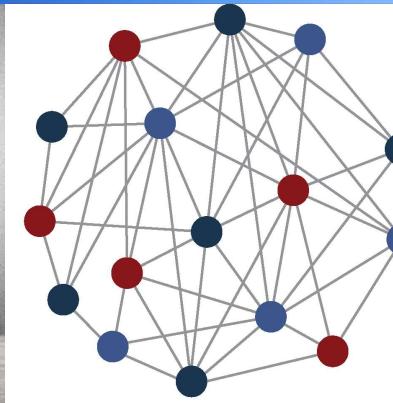
CUSTOMER



INVESTOR



BROKER



REGULATOR





# A Moon Village Future

Jan Wörner, President acatech

