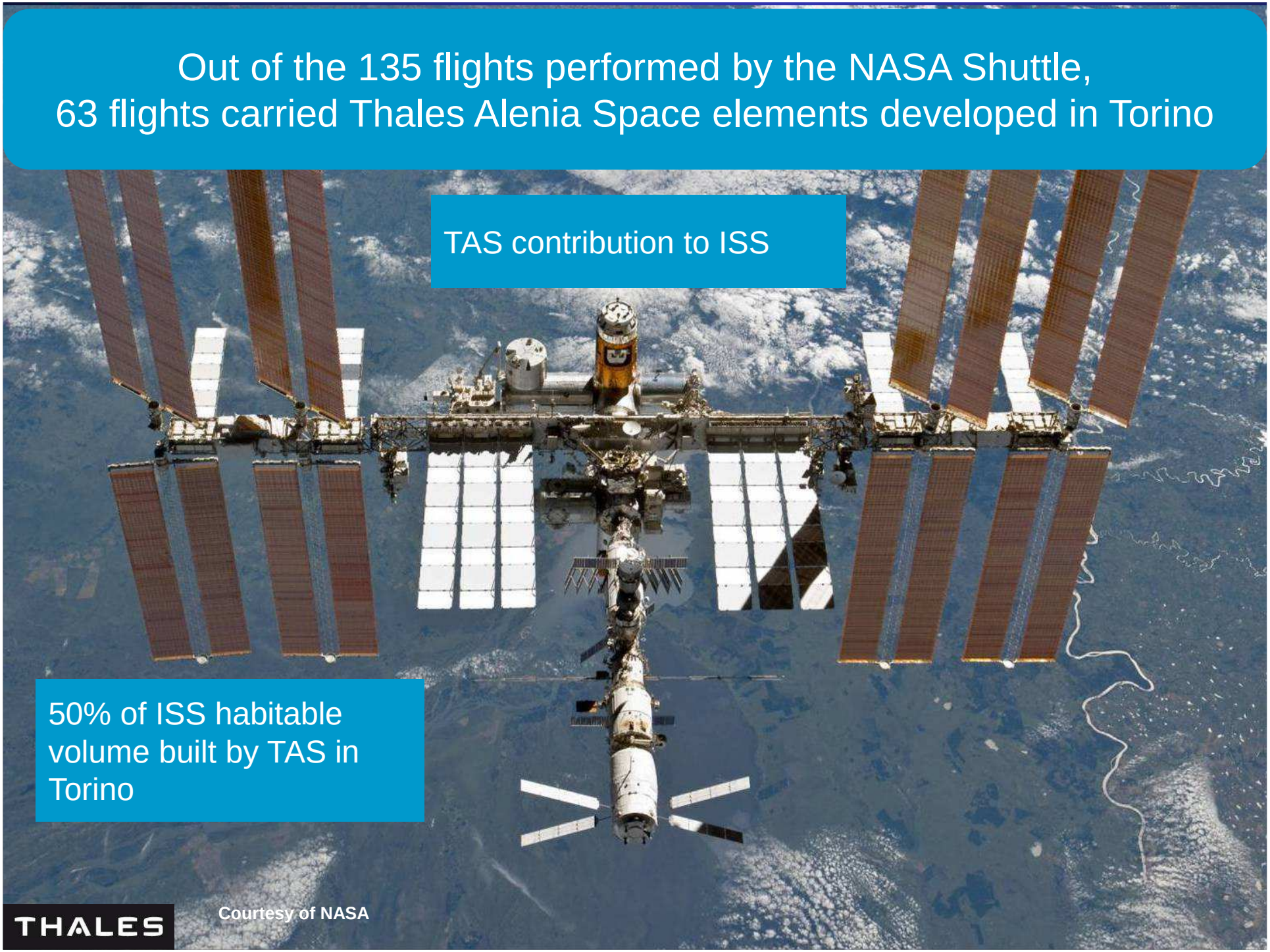

WE LOOK AFTER THE EARTH BEAT
Space Exploration –European leadership
OPEN
ThalesAlenia
Space
83230913-DOC-TAS-EN-001

Out of the 135 flights performed by the NASA Shuttle,
63 flights carried Thales Alenia Space elements developed in Torino



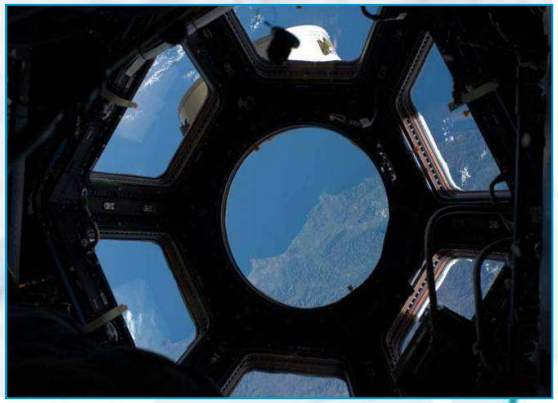
TAS contribution to ISS

50% of ISS habitable volume built by TAS in Torino

Courtesy of NASA

THALES

Cupola on-orbit



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A Thales / Finmeccanica Company

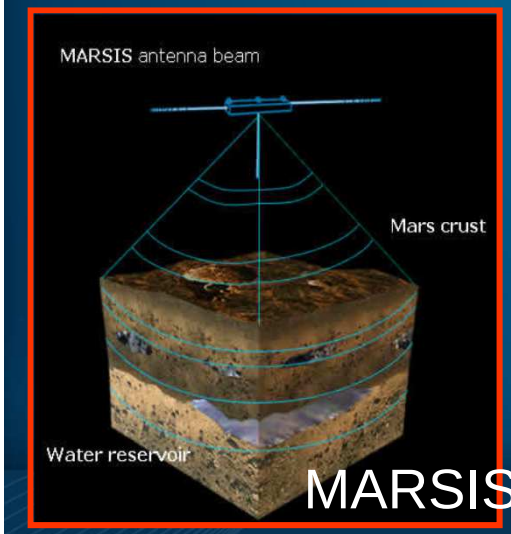
Thales Alenia Space: Planetary Exploration

Huygens

The farthest human made vehicle ever landed on a celestial body

“ A success, a scientific success, a fantastic engineering success for Europe. We are the first visitors on Titan. We will reveal the wonders of a new world ”

Jean-Jacques Dordain
ESA General director
Darmstadt, 14 January 2005



MARSIS

RADAR for MARS

SHARAD – NASA MRO

ThalesAlenia Space

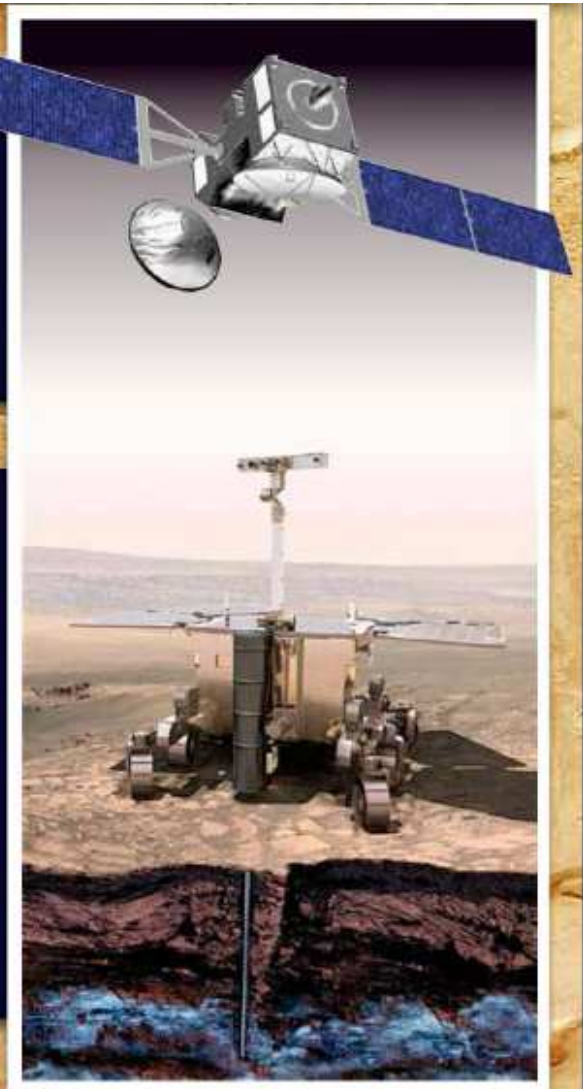
Mission 2016 - 2020

2016: ExoMars Trace Gas Orbiter

- Its science will improve our understanding of Mars and of key atmospheric processes of potential astrobiological relevance.
- An excellent base for international collaboration.
- Master landing technologies for future European missions.

2018: ExoMars Rover

- A great exobiology mission.
- The first ever to combine mobility with access to the subsurface.
- The rover's Pasteur payload contains next-generation instruments.
- The rover will study for the first time:
  - Organics and biomarkers for past and present life at depth;
  - Vertical characterisation of geochemistry and water.
- The rover implements novel sample handling and locomotion.
- A step closer to Mars Sample Return.



Credit: MEX/HRSC

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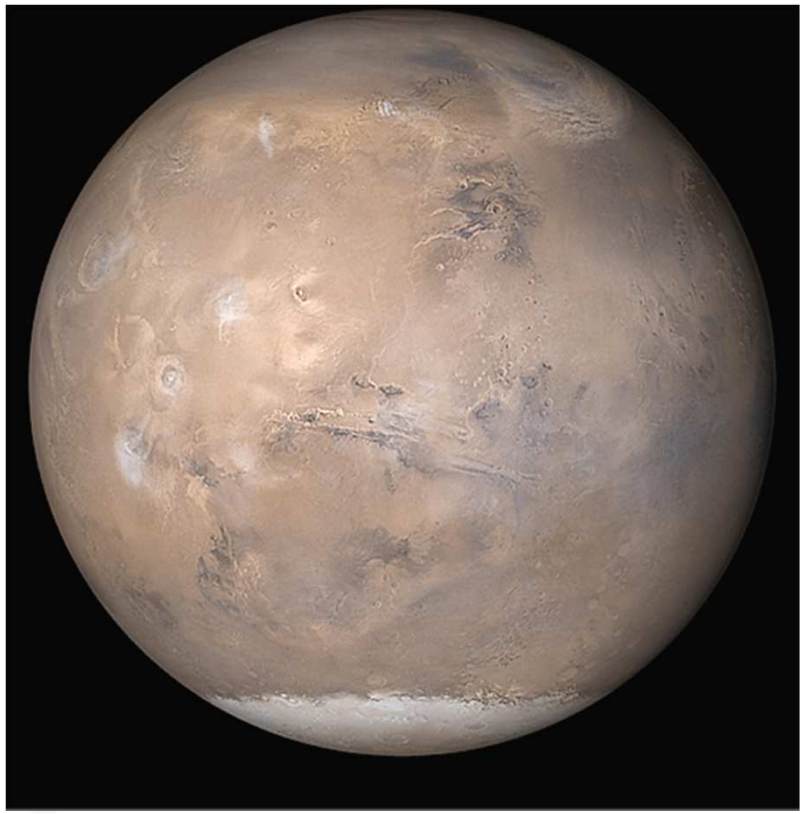
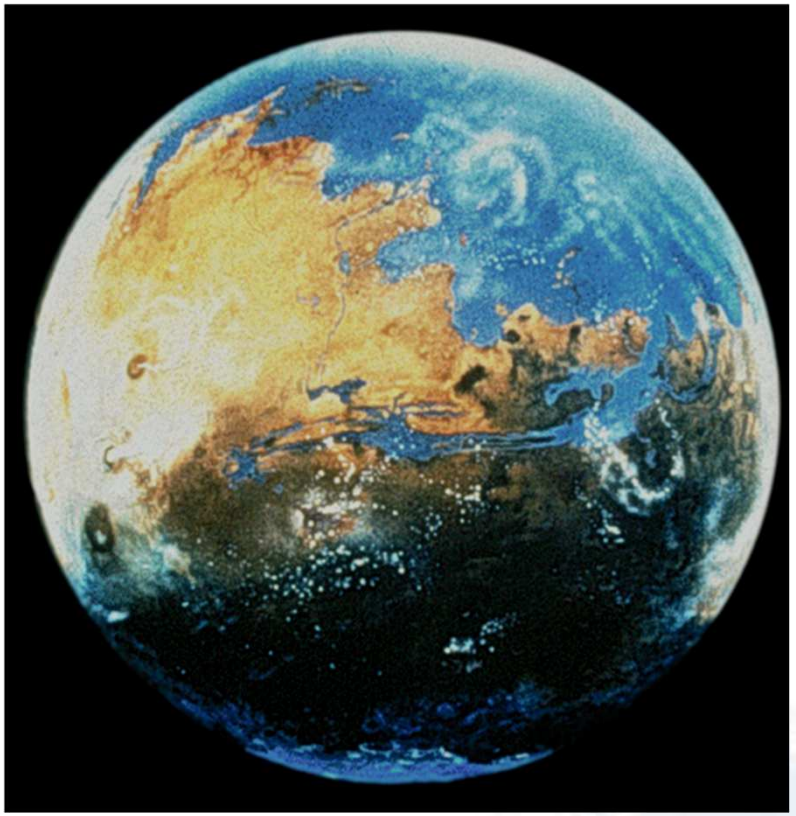
why MARS?





Now: Cold and Arid

Past: Wet and Warm?

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Mission 2016
Satellite Composite

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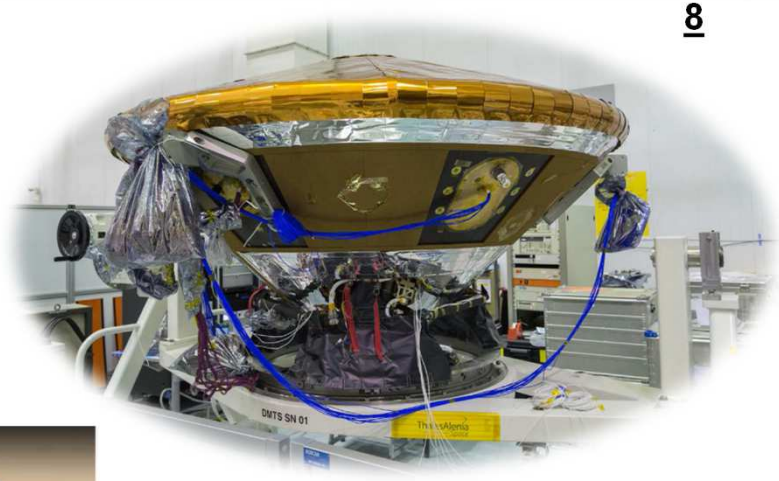
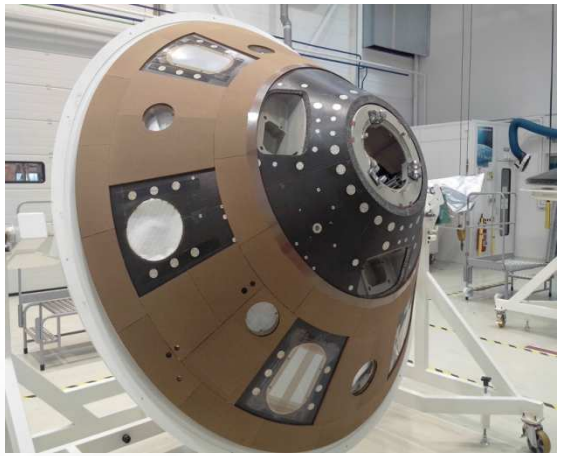
Mission 2016
EDM Schiaparelli





LANDING

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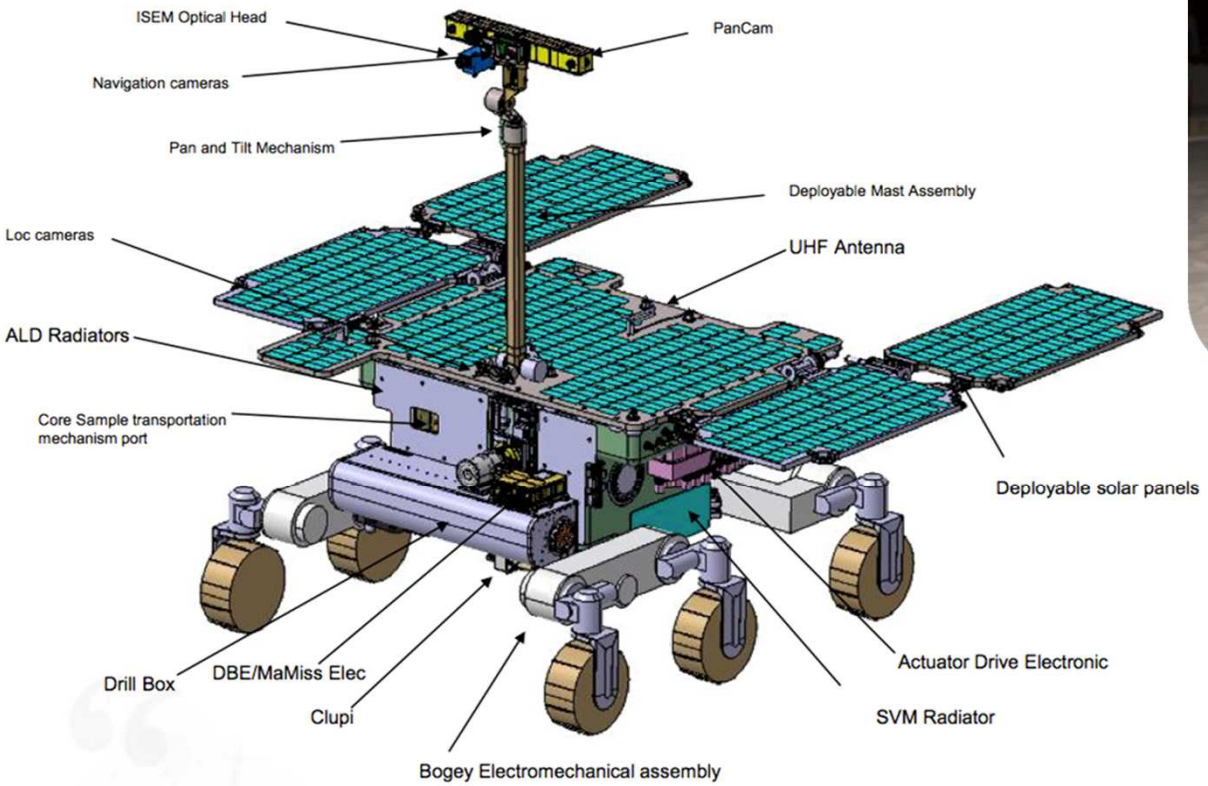
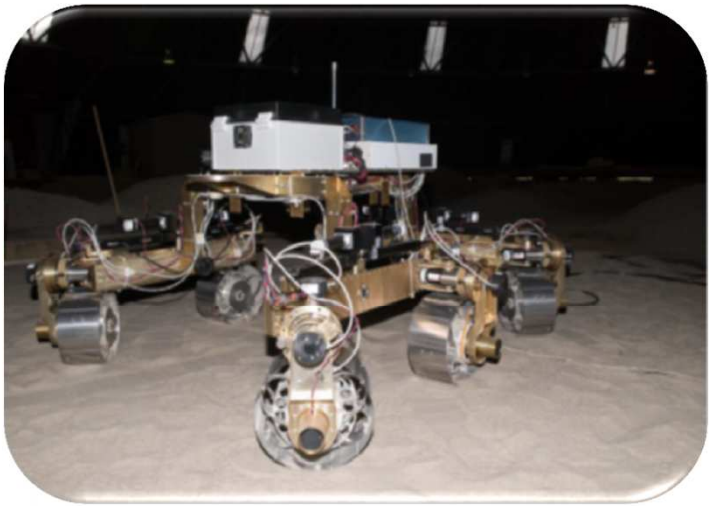
Mission 2020
Rover



Modulo Rover



Rover: test vehicle for mobility

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Mission 2020
what

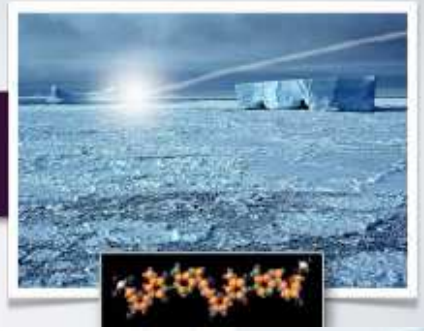
- **PRESENT LIFE:** Biological markers, such as:

Amino acids | Nucleobases | Sugars | Phospholipids | Pigments | ...

- **PAST LIFE:** Organic residues of biological origin;
(chemical, chiral, spectroscopic, and isotopic info)

Images of fossil organisms and their structure;
(morphological evidence)

- **DELIVERED ORGANICS:** by meteoritic and cometary infall.



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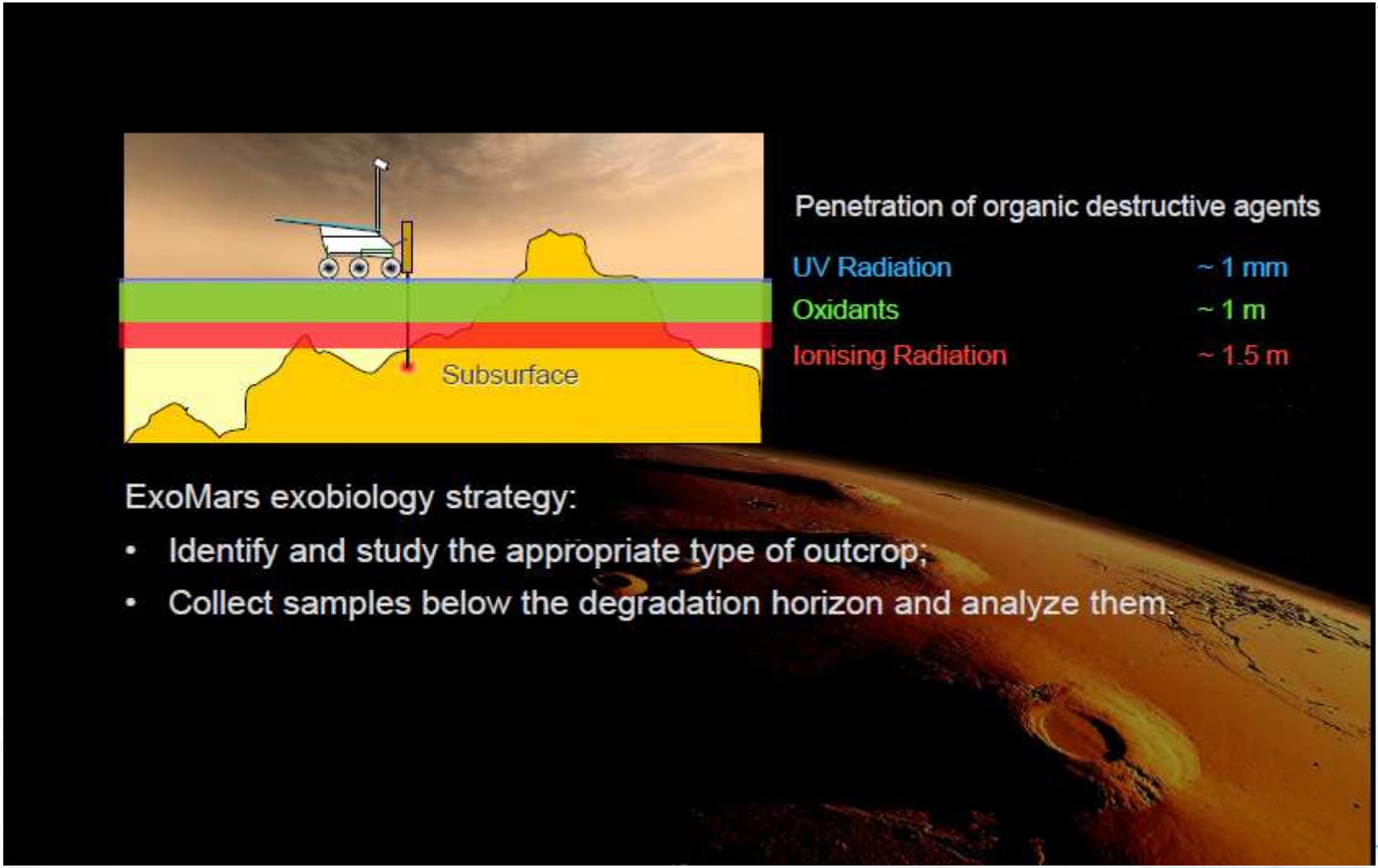
Mission 2020 where



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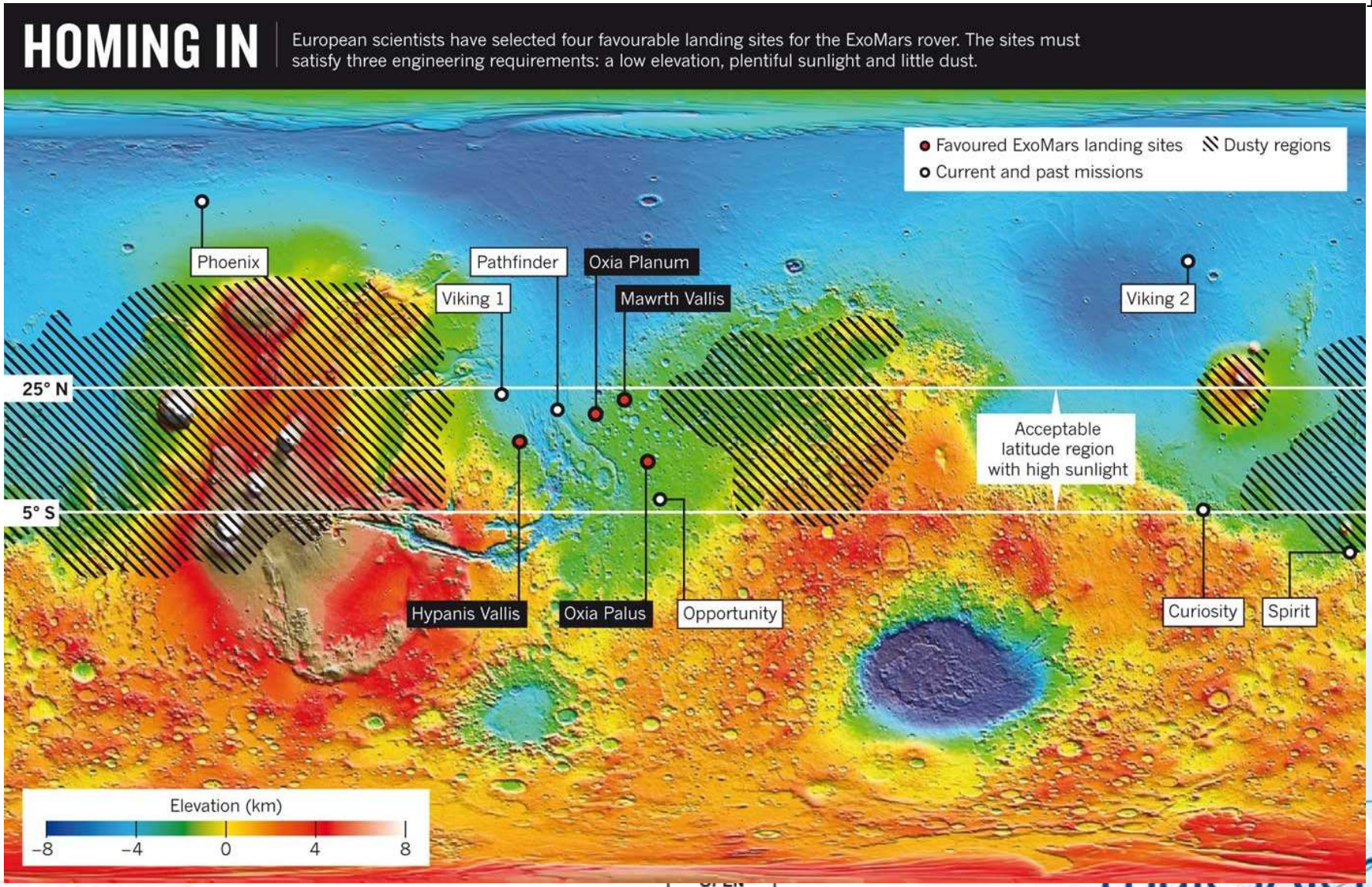
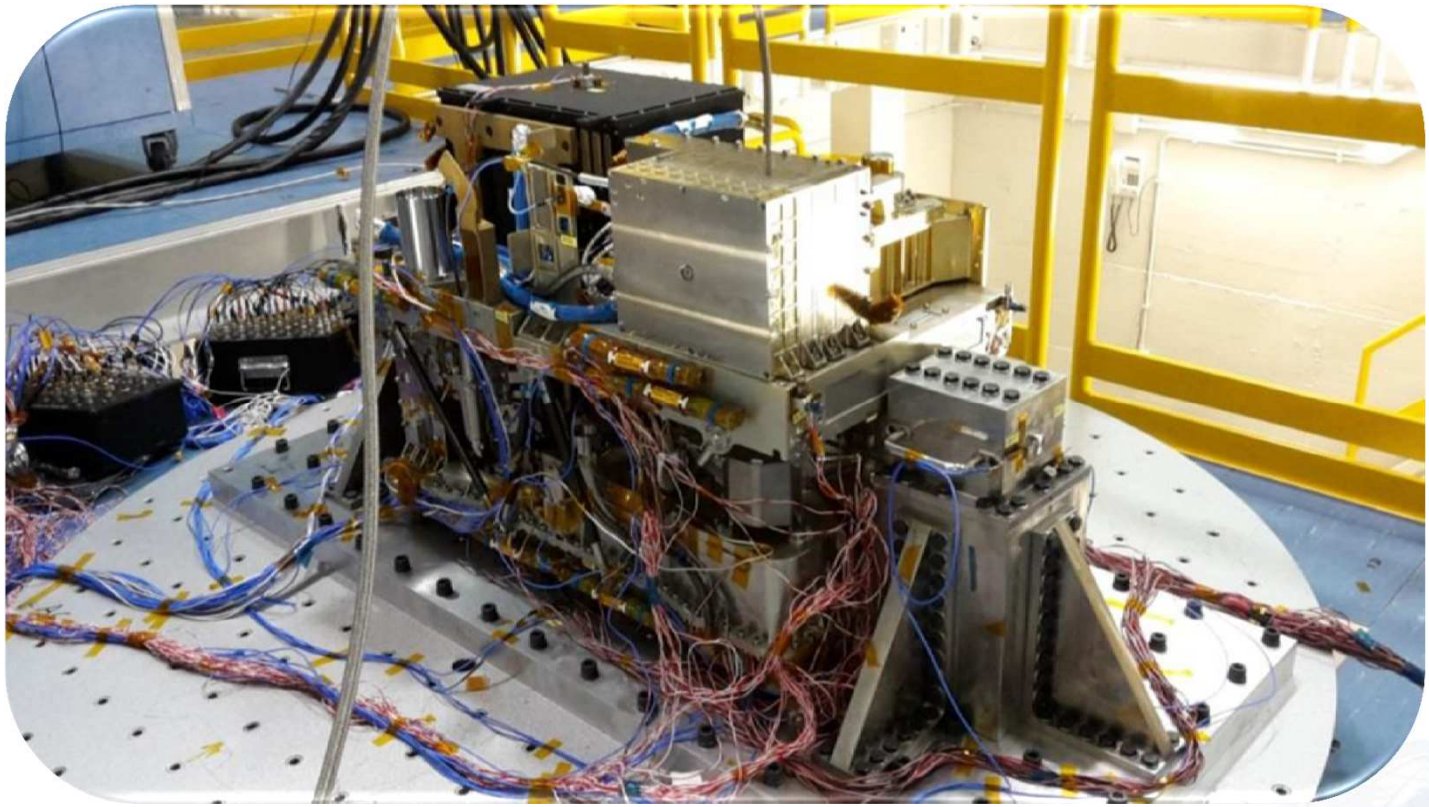
Mission 2018
Possible sites



Mission 2020
Technology ready



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Preparation for Exploration – System Studies

European Architectures for Exploration (ESA)

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Preparation for Exploration – Technologies

Virtual Simulation

Planetary Environment

Food Production

Smart Skin

Regenerative Fuel Cells

Water Regeneration

Rendez Vous Demonstrator

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