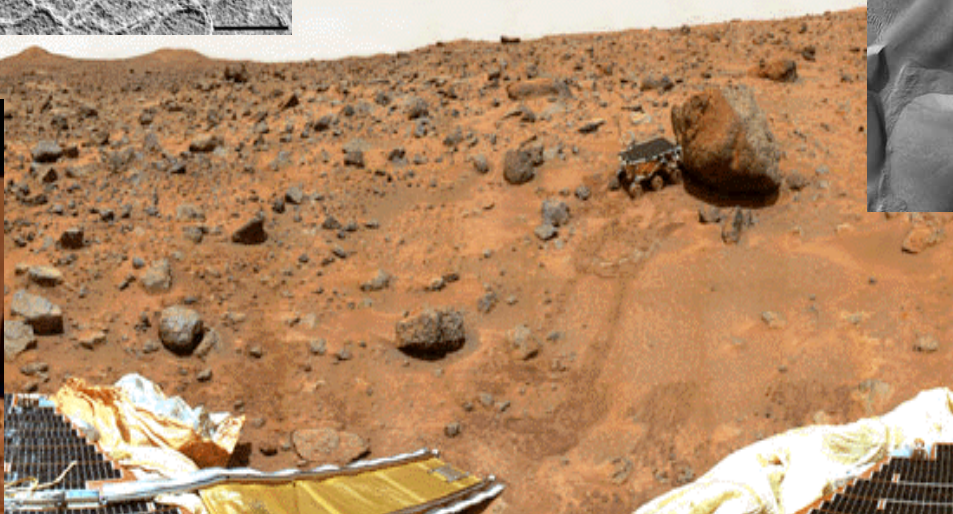
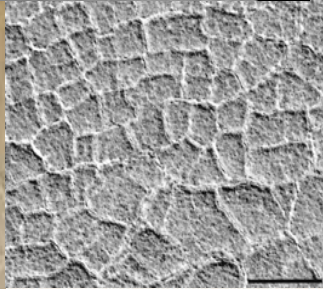
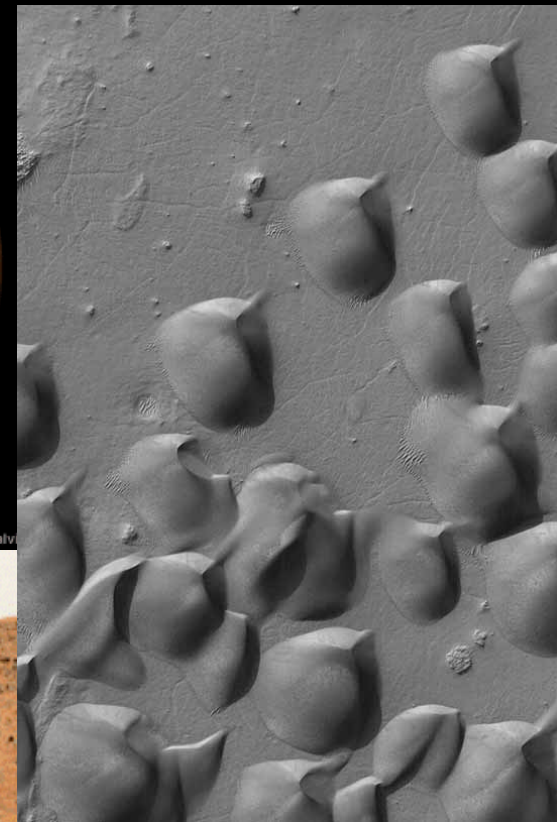
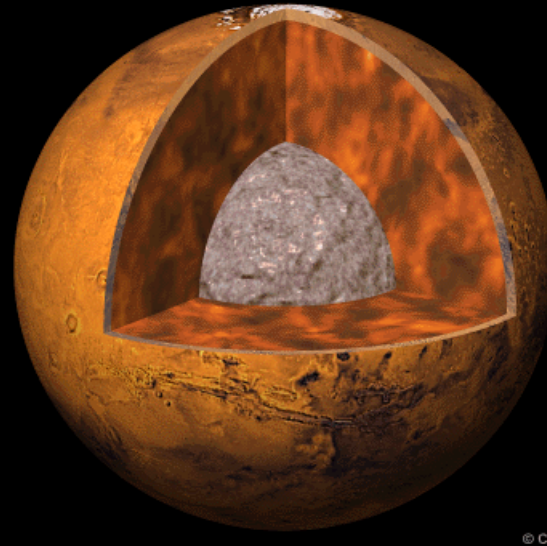
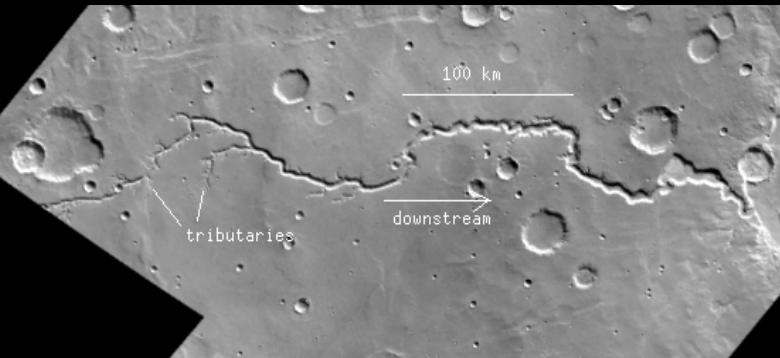
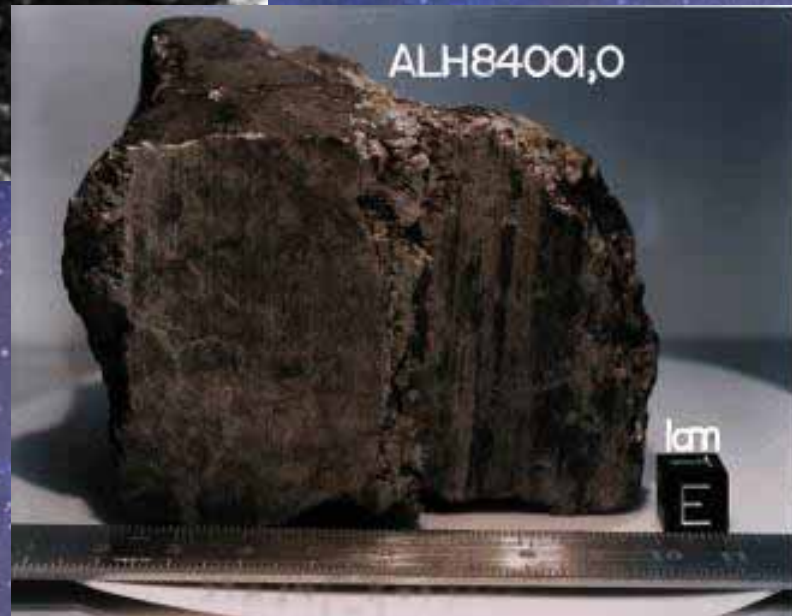
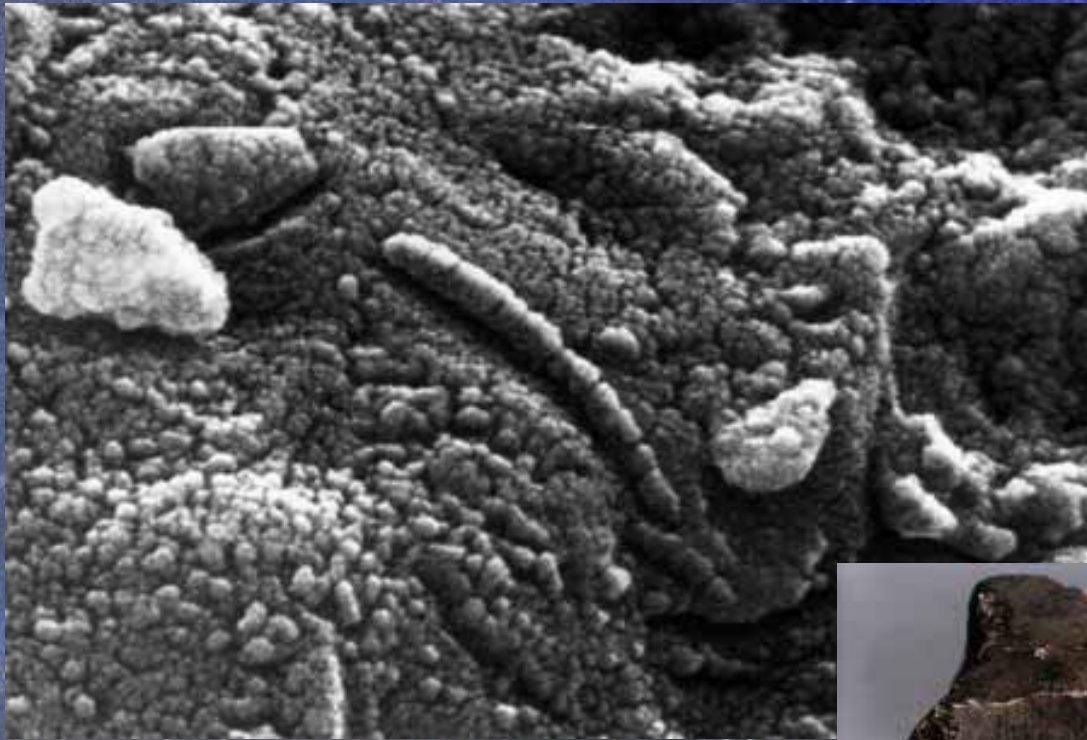


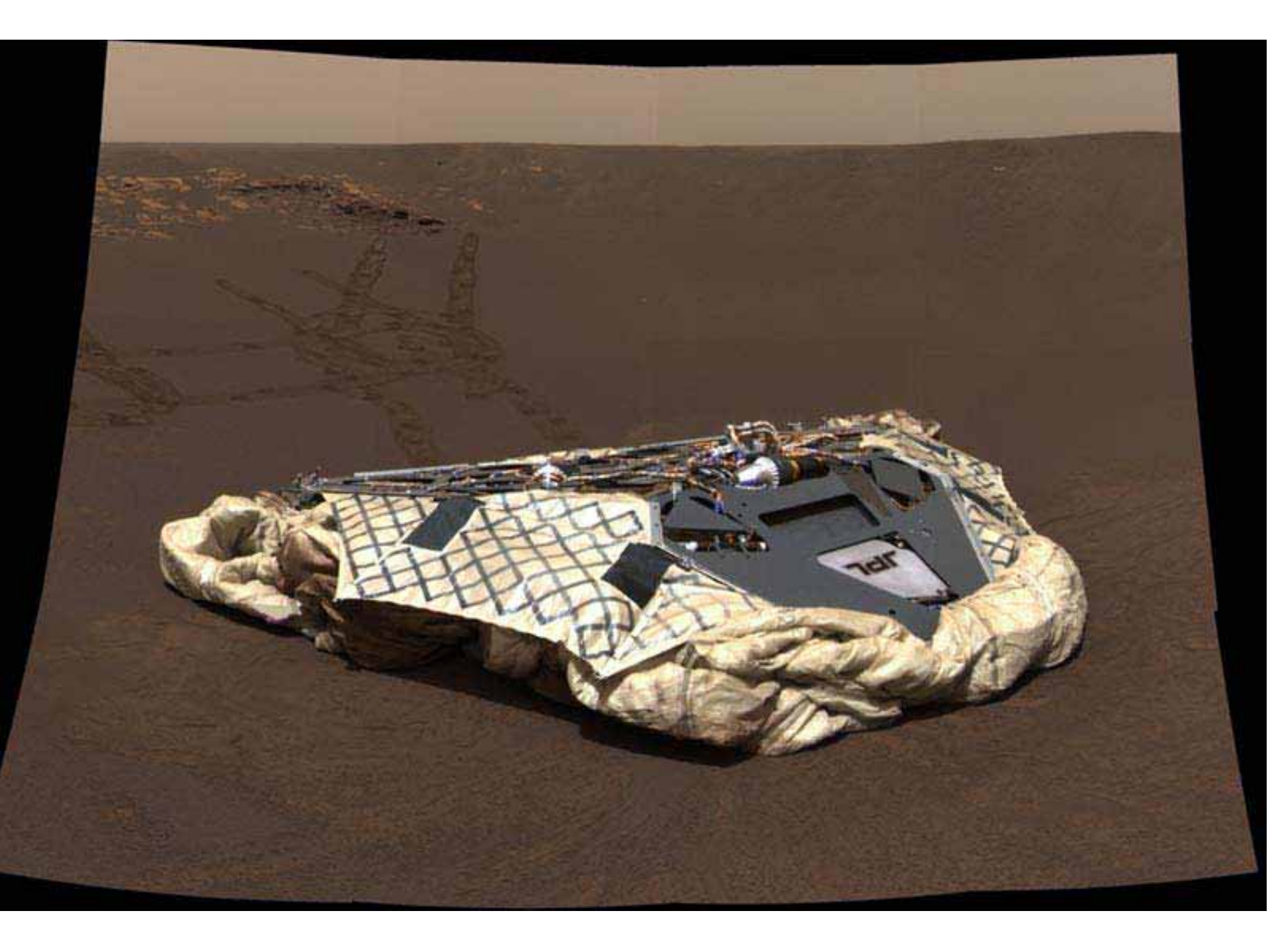


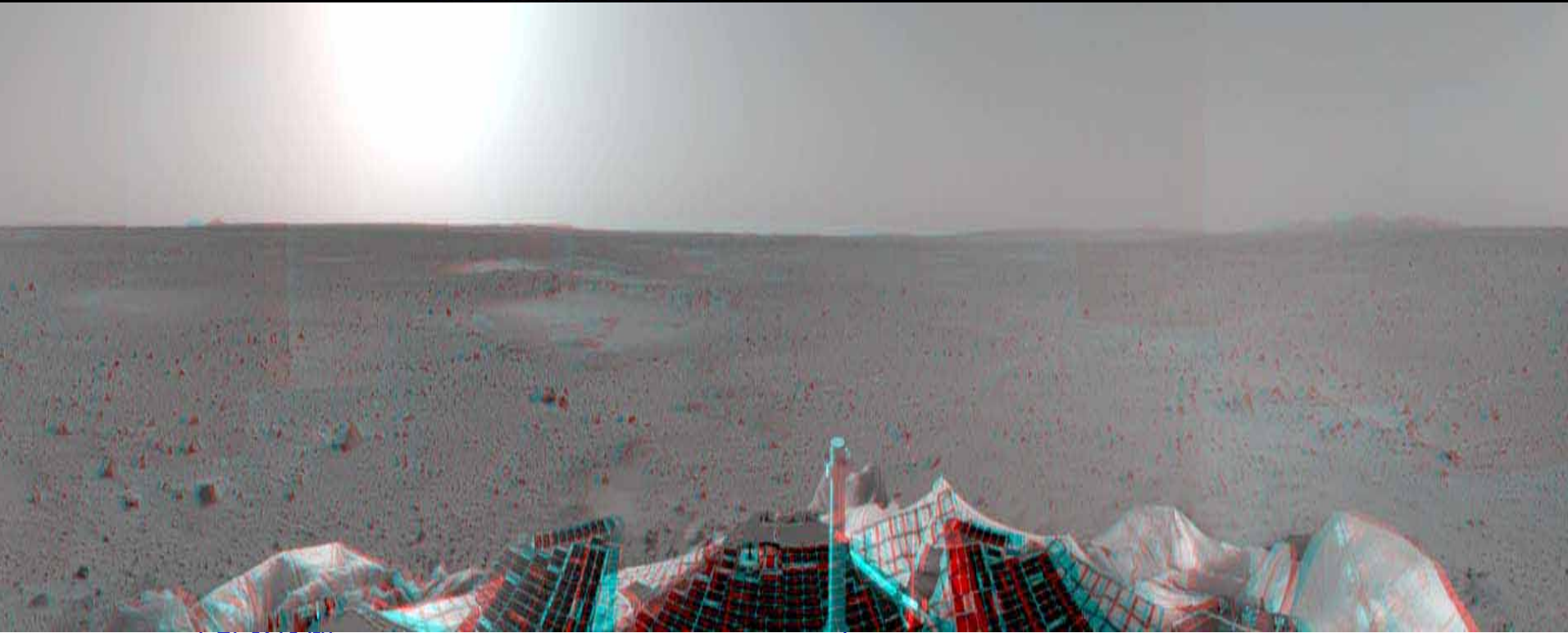
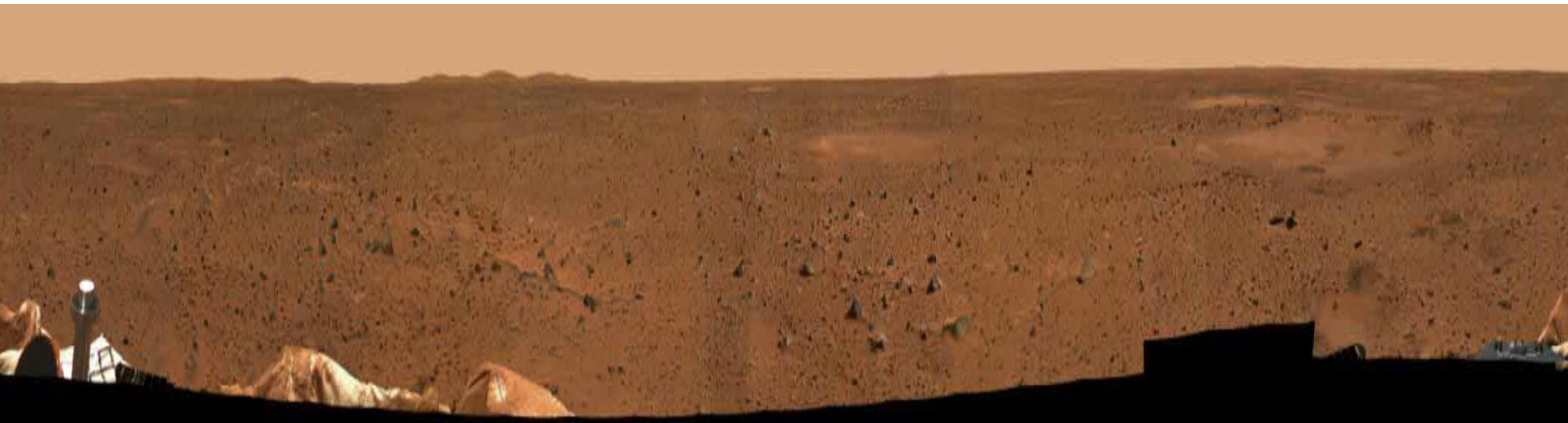
***Mars: new land for local
agriculture, Fondi 21-5-04***

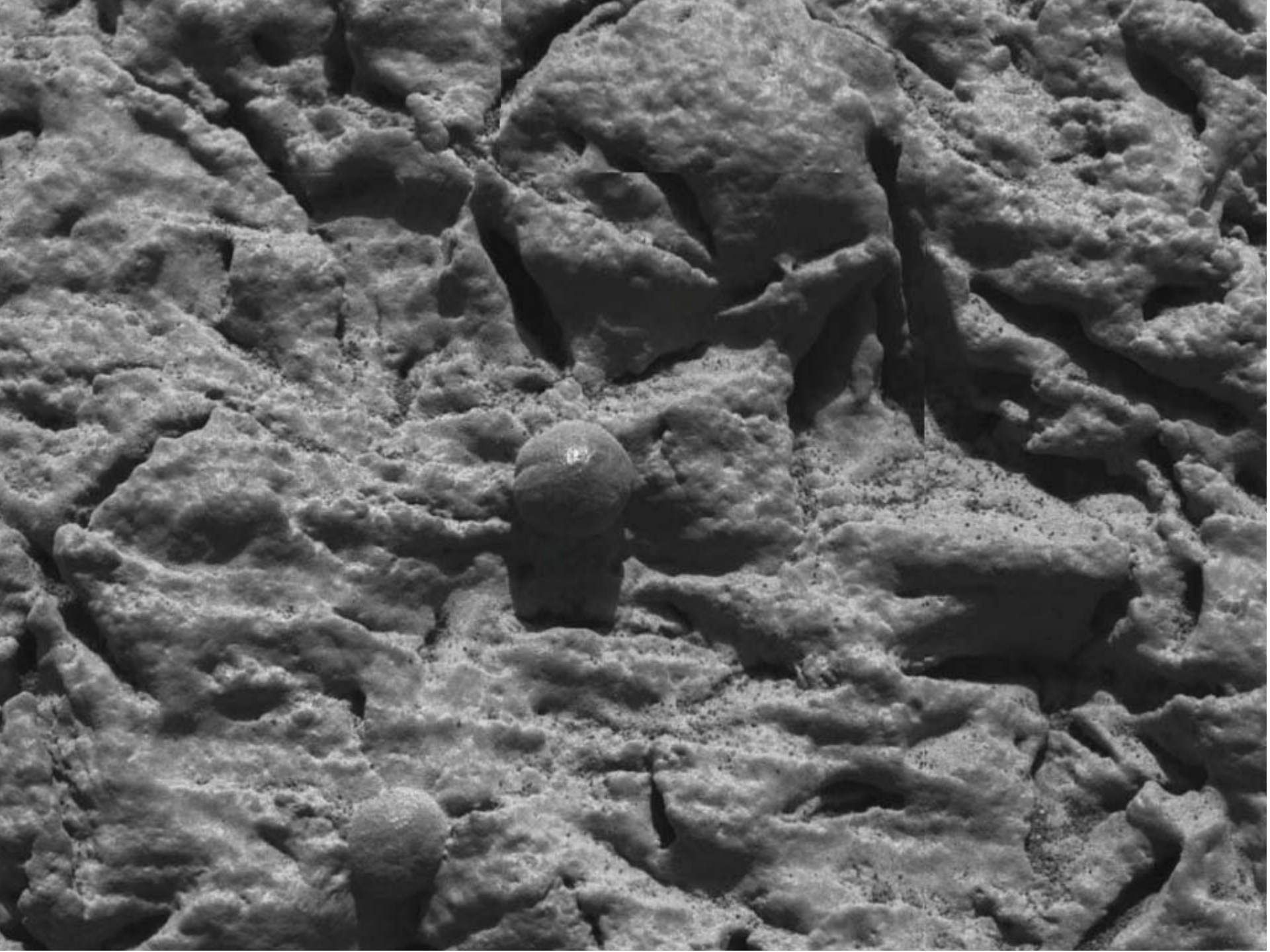
MARS- a fascinating planet







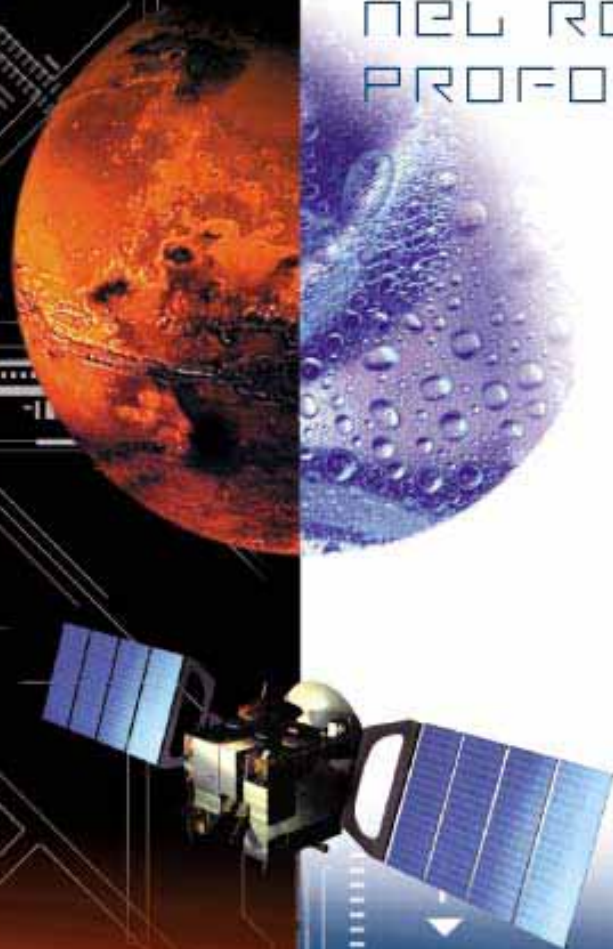




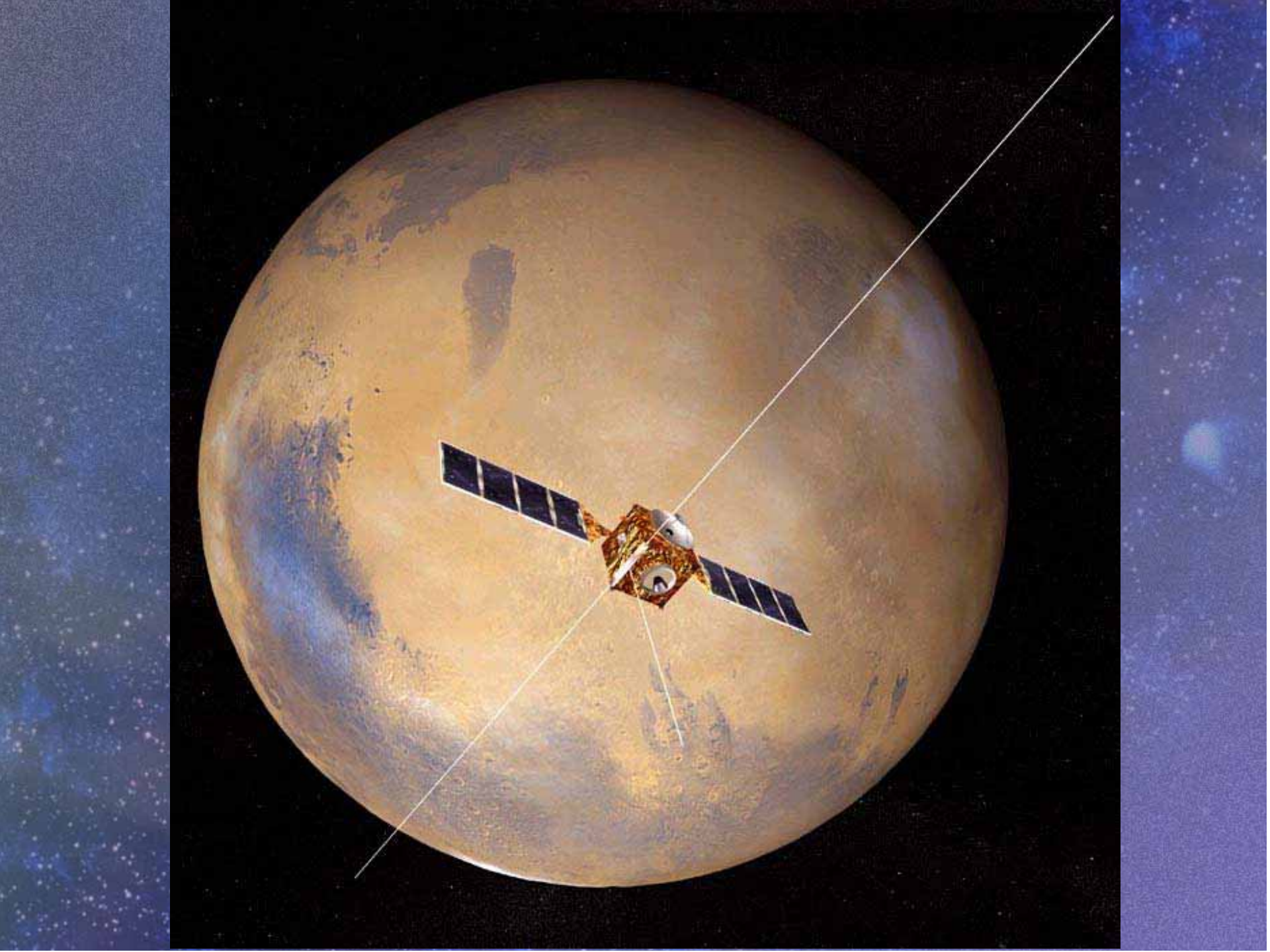


MARS EXPRESS

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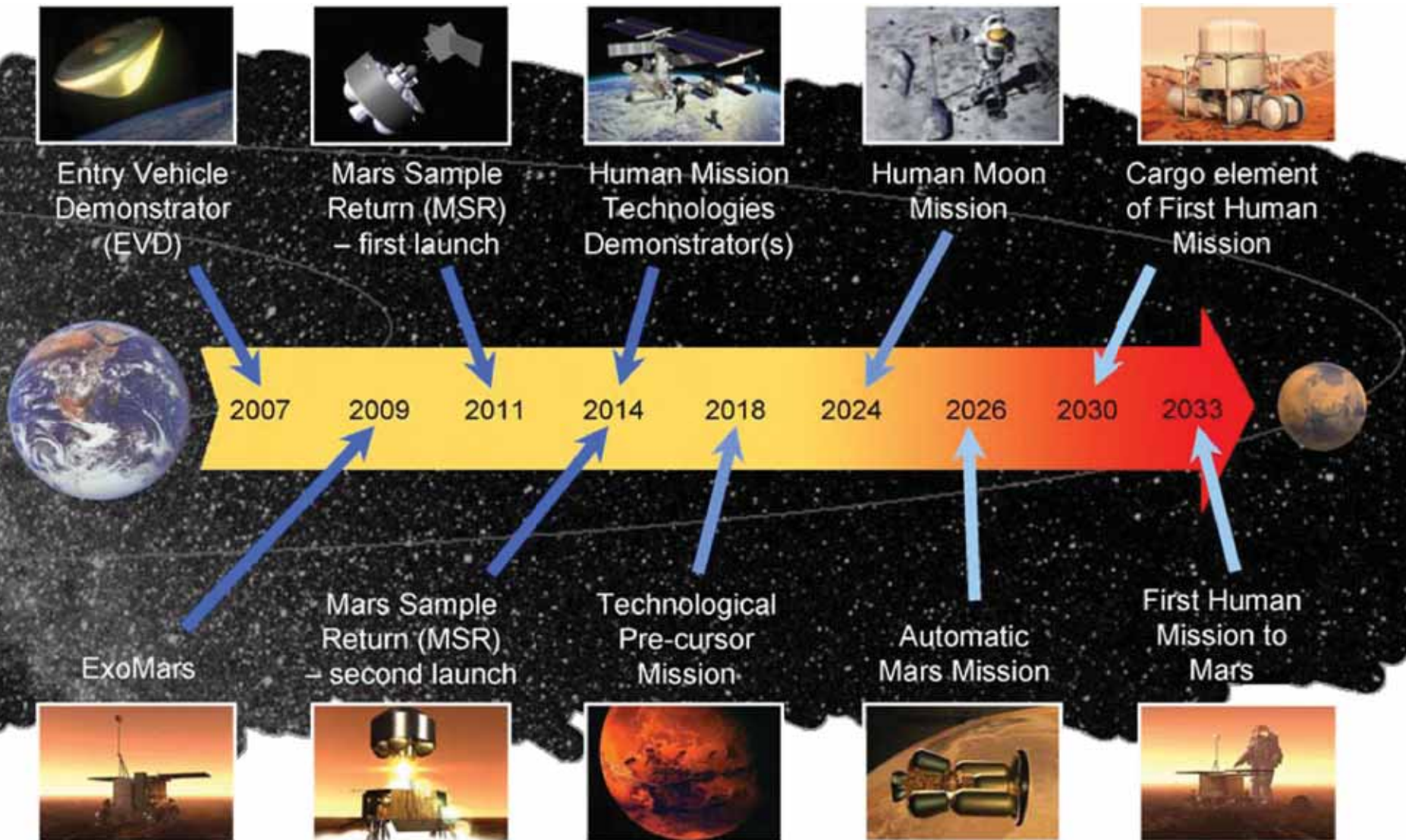
*Mission to the Red Planet
An European Orbiter and Lander*



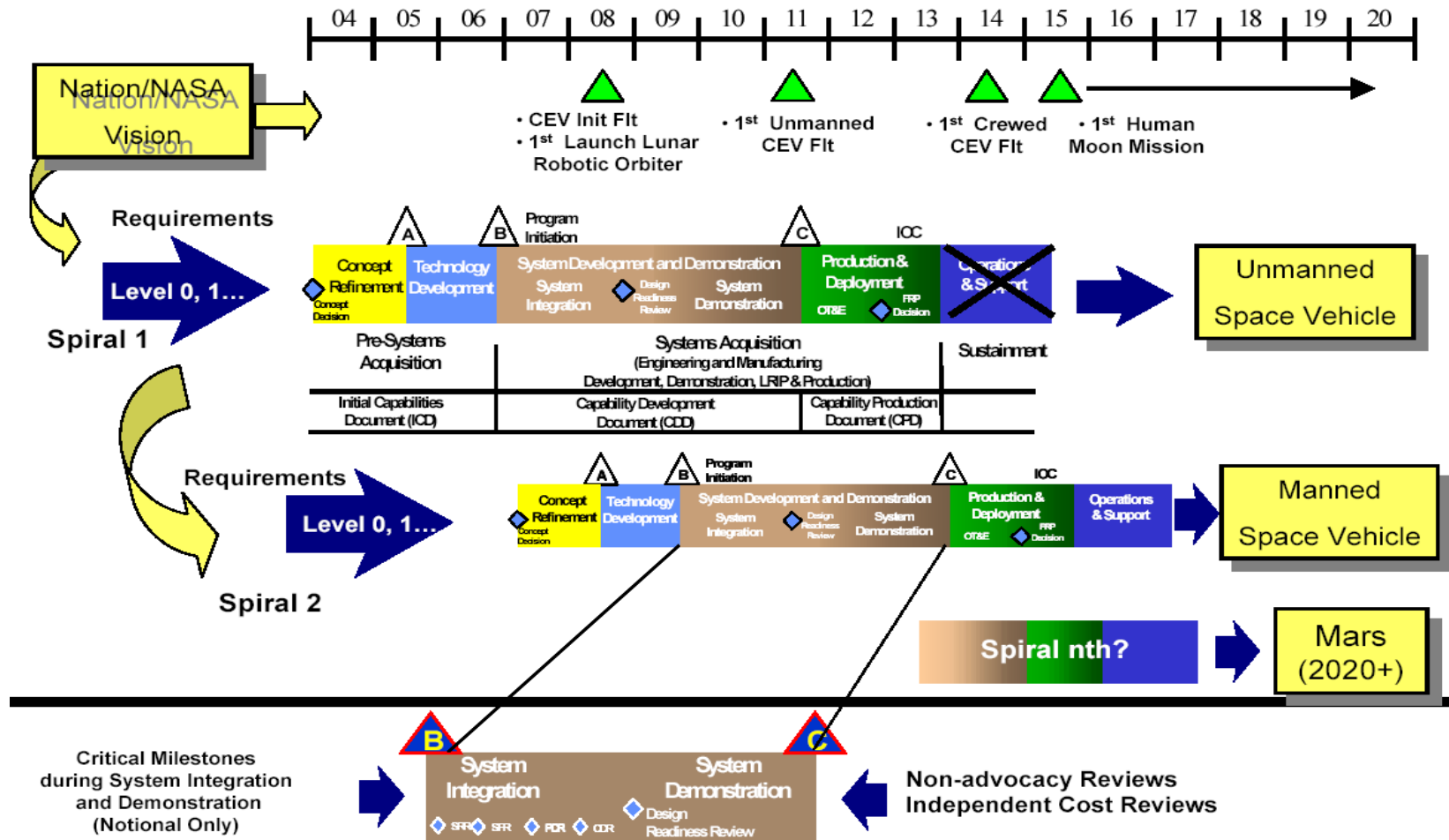


SHARAD – Aug. 2005

Missions



NASA Development Programs Timeline

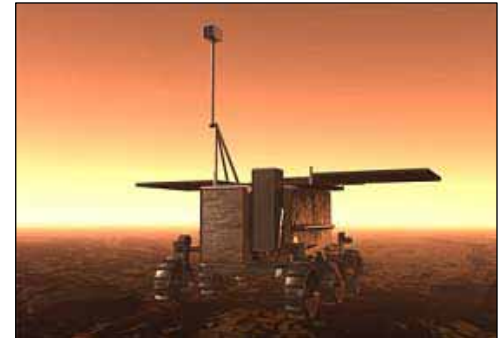


Technological Objectives:

- Landing of large payloads on the surface of Mars
- **Solar electric power application on the surface of Mars**
- Mars surface mobility
- **Rendezvous in Mars orbit**
- Forward planetary protection

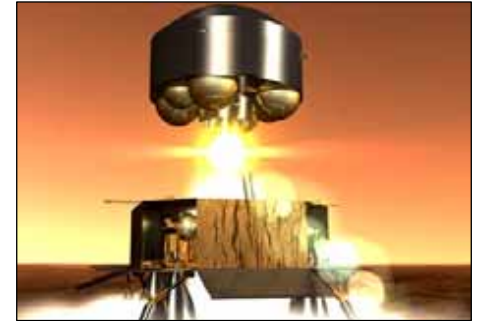
Scientific Objectives:

- Search for signs of past and present life
- **Identification and characterisation of potential hazards to humans**
- Enhancement of the knowledge of the Martian environment



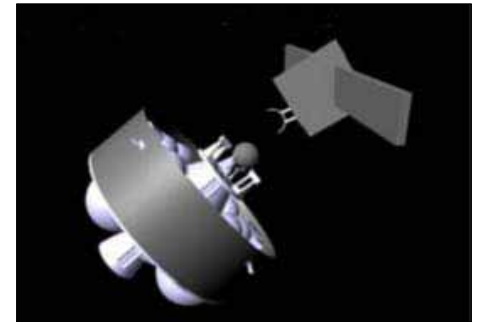
Technological Objectives:

- Entry, descent and landing system validation
- **Mars ascent vehicle validation**
- Sampling of atmosphere, top and deep soil
- **Forward and backward planetary protection**
- Operational aspects of a round trip to Mars



Scientific Objectives:

- Search for signs of life
- **Perform geological/mineralogical analyses on samples of soil**
- Perform analyses of samples of Martian atmosphere
- **Identify and characterise potential hazards for humans**



Primary Objectives:

- Demonstrate assembly in orbit for planetary missions
- **Demonstration of Life Support Aspects of Moon Mission in LEO**
- Demonstration of Habitation Aspects of Moon Mission in LEO
- **Demonstration of EVA Aspects of Rehearsal Mission 1 in LEO**
- Demonstration of micro-gravity countermeasures in LEO
- **Demonstrate Mars Docking System in LEO**
- Demonstrate Re-entry Vehicle from LEO

Secondary Objectives:

- Perform operational procedures
- **Perform Life Sciences experiments**



Technology Precursor Mission 2018

Primary Objectives:

- **Demonstrate intermediate size Aerocapture/Aerobraking**
- **Demonstrate intermediate size Solar Electric Propulsion**
- **Demonstrate intermediate size Soft/Controlled Landing**
- **Demonstration of operational procedures for missions**
- **Verification of aerocapture aspects for human size missions**
- **Setting up of an In Situ Propellant Production experiment**

Secondary Objectives:

- **Search for signs of life**
- **Perform geological/mineralogical analyses on Martian soil**
- **Perform analyses of samples of Martian atmosphere**
- **Identify and characterise potential hazards for humans**
- **Place telecommunication and remote sensing infrastructure**

Human Mission to the Moon 2024

Primary Objectives:

- **Demonstration of Life Support System**
- **Demonstration of Habitation Module for interplanetary trajectory**
- **Demonstration of In-space and Surface EVA**
- **Demonstration of Re-entry to Earth**
- **Crew aspects following long term isolation**
- **Crew performance aspects in reduced gravity after prolonged μ -g**
- **Demonstration of operational capability**

Secondary Objectives:

- **Perform exploration tasks on the Moon**
- **Perform science tasks on the Moon**



Automatic Mission to Mars 2026

Primary Objectives:

- **Demonstration of Interplanetary Propulsion for a man-rated full size vehicle**
- **Demonstration of Capture for a man-rated full size vehicle**
- **Demonstration of Entry, Descent and Landing for a man-rated full size vehicle**
- **Demonstration of Ascent and Docking for a man-rated full size vehicle**

Secondary Objectives:

- **Delivery of Surface Infrastructure (rover, tools, beacon etc.)**
- **Delivery of meteorological station to future landing site**
- **Delivery of science packages to the Surface of Mars**

First Human Mars Mission 2030/2033

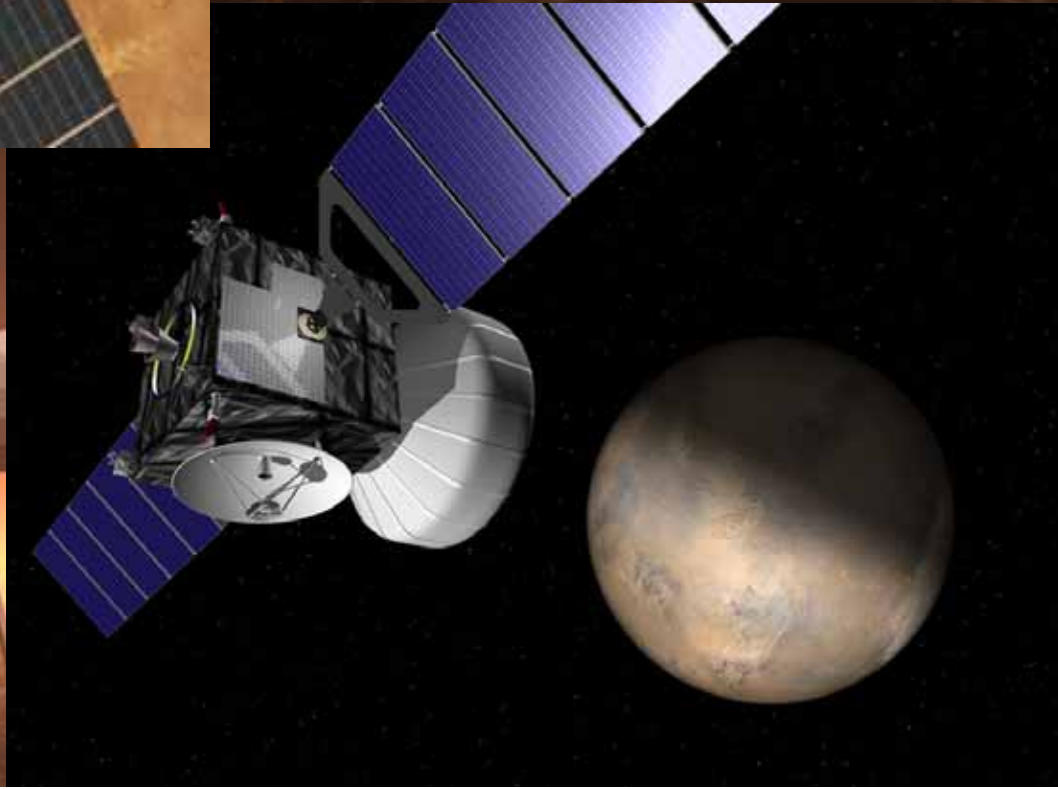
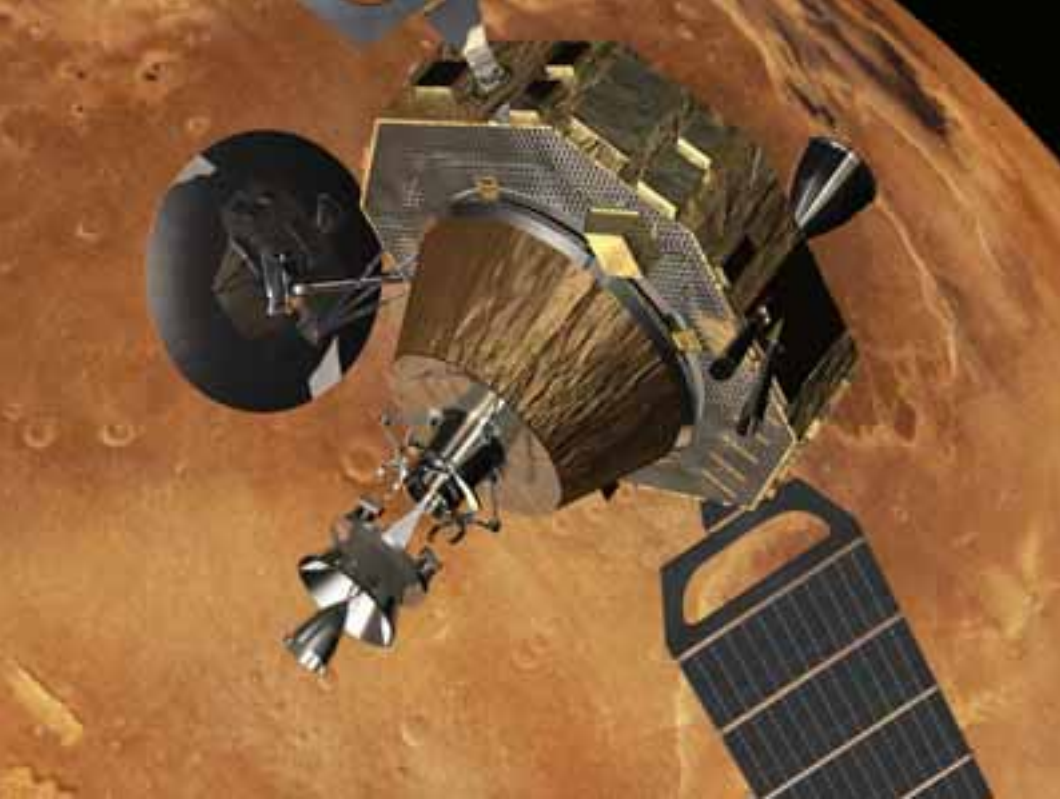
Primary Objectives:

- Land a crew of humans on Mars by 2030 and return them safely, ensuring planetary protection for both Earth and Mars
- Demonstrate human capabilities needed to support human presence on Mars
- Perform exploration and expand scientific knowledge taking maximum advantage of human presence including sample selection

Secondary Objectives:

- Assess suitability of planet for long term human presence (habitability, resources availability, engineering constraints)





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