

# Opportunity of Thailand Space Industry via National Space Exploration Project of GISTDA



## NAC 2019

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# What is Space Industry ?

- An Economic activities related to manufacturing components that go into Earth's orbit or beyond.
- Full range of activities and resources that create and provide value and benefits to human beings in the course of exploring, understanding, managing, and utilizing space

There are 3 major sectors of the space industry :



## Satellite Manufacturing

- Satellite and their subsystems manufactures, including satellite environment testing



## Support Ground Equipment Manufacturing

- The ground equipment sector is composed of manufacturing items like mobile terminals, gateways, control stations, VSATs, direct broadcast satellite dishes and other specialized equipment.



## The Rocket & launch Industry

- launch services, vehicle manufacturing and subsystem manufacturing

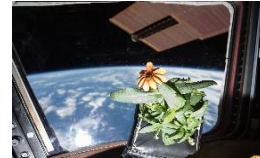


In additional, Space tourism industry and Spaceport

# Global Space Market

## The service and industry relevant to space

- precision health and remote medicine
- 3D-printing and High-tech materials
- Positioning, Navigation and Timing infrastructure
- Safety and security system
- The lunch vehicle and satellite service
- Aerospace and aircraft manufacturing
- Research and exploration new space technology and knowledge
- Earth, Geo-informatic data and space utilized in marine jurisdiction and airspace
- Robot and Drone infographic
- Space Food technology and Plants in Space
- Space Tourism





# Mars Exploration



Carbon dioxide	95.32%
Nitrogen	1.9%
Argon	1.6%
Oxygen	0.13%
Carbon monoxide	0.08%

Opportunity at Endeavour Crater - Sol 3335 Credit: NASA/JPL/Cornell/Marco Di Lorenzo/Ken Kremer

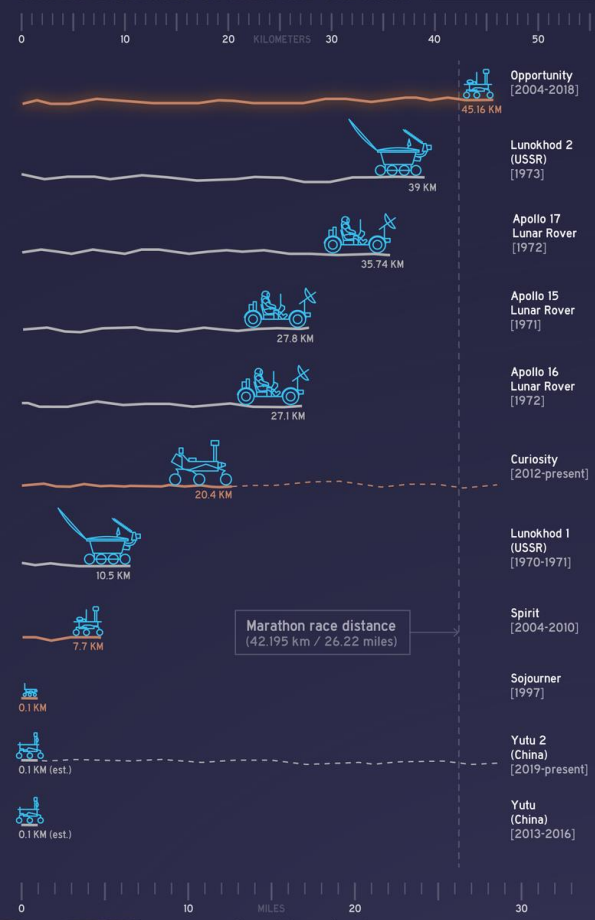


Opportunity nears Solander Point at Endeavour Crater Sol 3374 Credit: NASA/JPL/Cornell/Marco Di Lorenzo/Ken Kremer

# OUT-OF-THIS-WORLD RECORDS! DRIVING DISTANCES ON MARS AND THE MOON

(AS OF FEBRUARY 13, 2019)

MARS — MOON —



Marathon race distance  
(42.195 km / 26.22 miles)

FOR MORE INFO, VISIT  
MARS.NASA.GOV

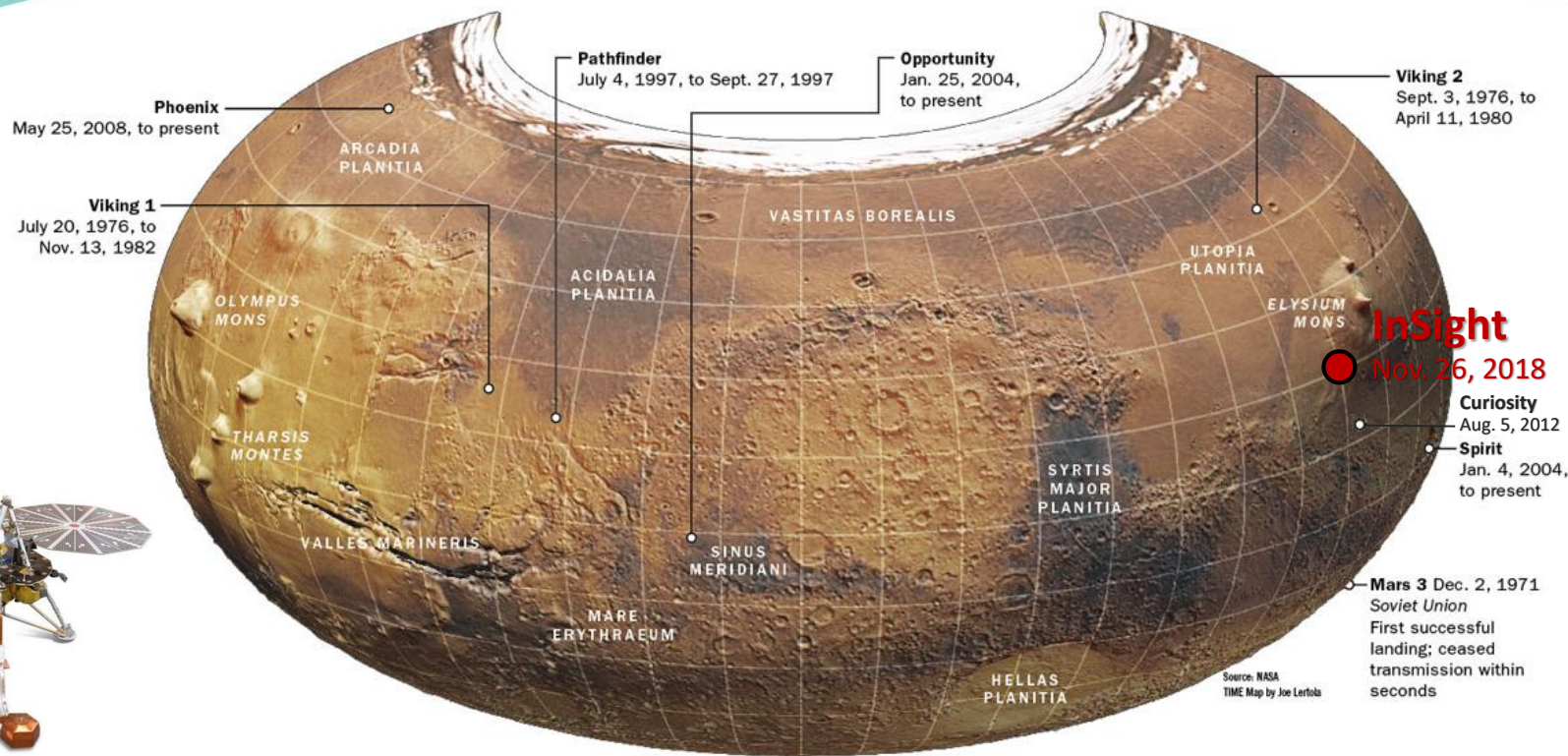
# Mars Exploration



**InSight**  
Nov. 26, 2018



# Mars Exploration



Source: NASA  
TIME Map by Joe Lertola

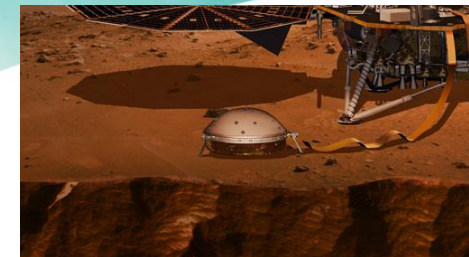
**InSight**  
Nov. 26, 2018

**Curiosity**  
Aug. 5, 2012

**Spirit**  
Jan. 4, 2004, to present

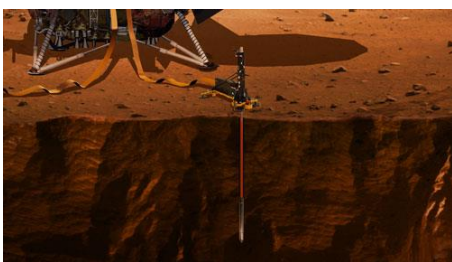
**Mars 3** Dec. 2, 1971  
Soviet Union  
First successful landing; ceased transmission within seconds

# Mars Exploration



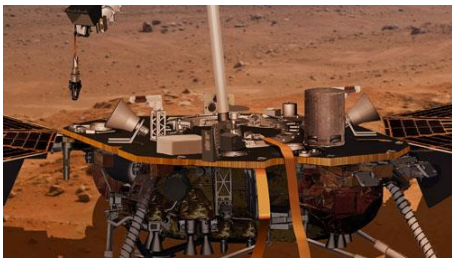
## **SEIS - Measuring the Pulse of Mars**

The seismometer, SEIS, measures the vibrations caused by the internal activity of Mars to illuminate the properties of the crust, mantle and core.



## **HP<sup>3</sup> - Taking Mars' Temperature**

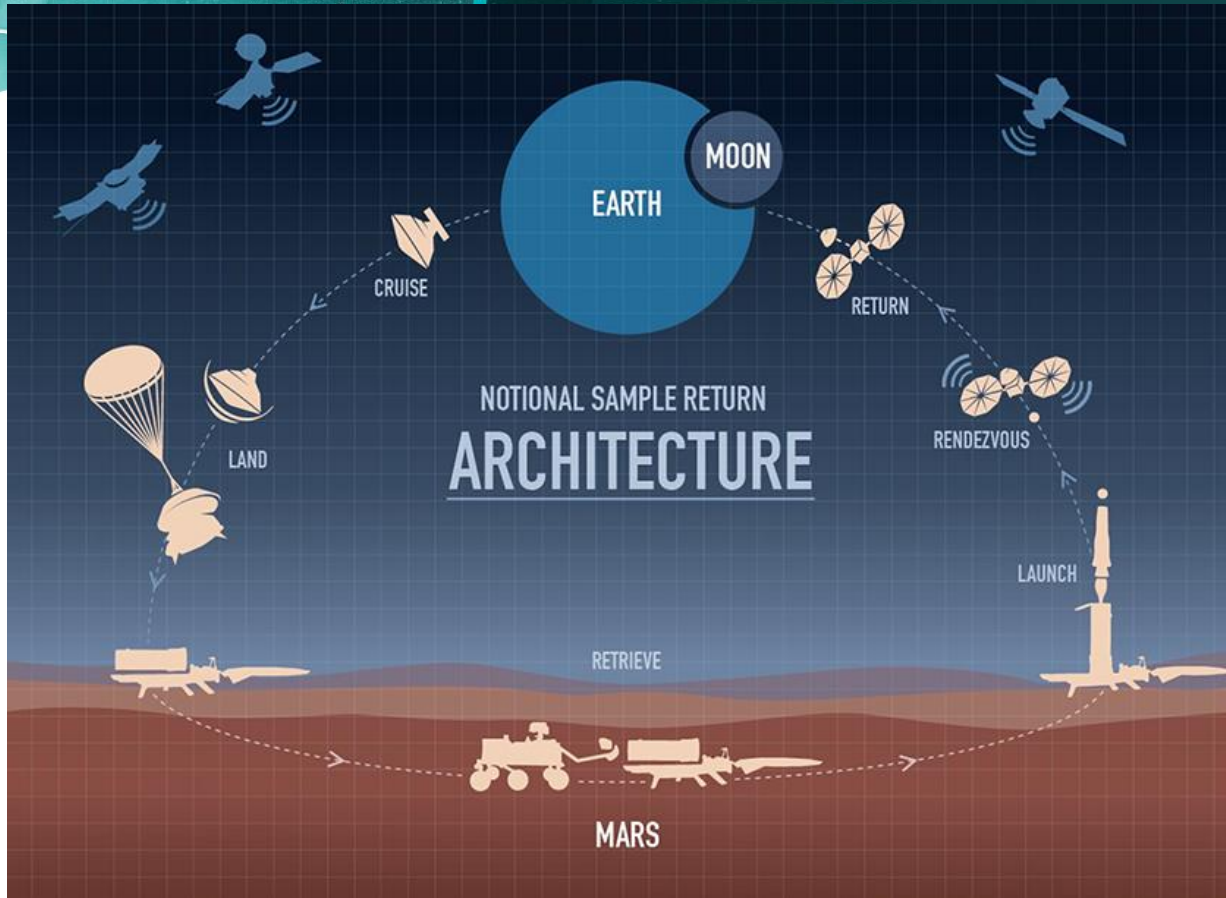
The heat probe, HP<sup>3</sup>, takes Mars' temperature to reveal how much heat is flowing out of the deep interior of the planet.



## **RISE - Testing Mars' Reflexes**

A radio science instrument, RISE, measures the wobble of Mars' North Pole as the sun pushes and pulls it in its orbit, providing clues on the size and composition of Mars' metallic core

# Mars Exploration





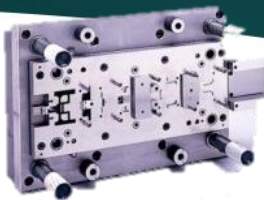


# What's Space Industry of Thailand

## Aerospace Industry



C.C.S. Group  
One Stop Manufacturing Company





# What's Space Industry of Thailand

## Space Industry (SME)

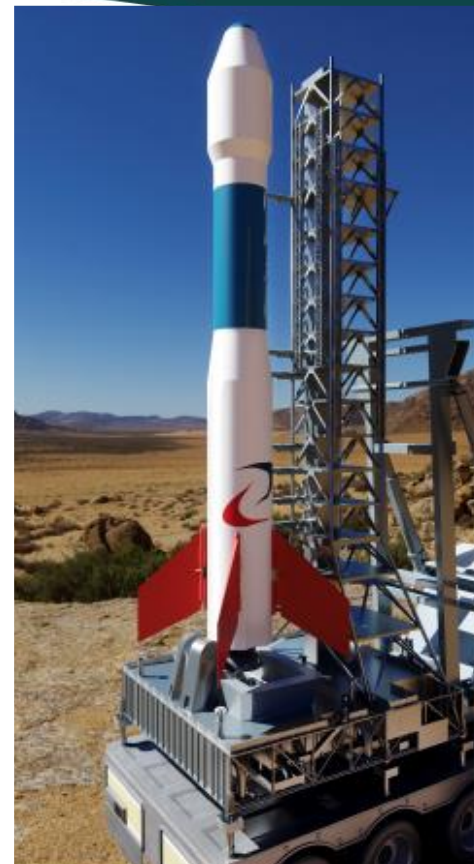
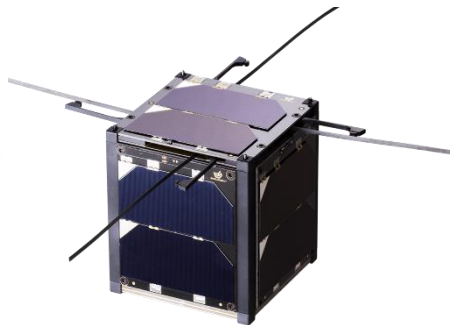
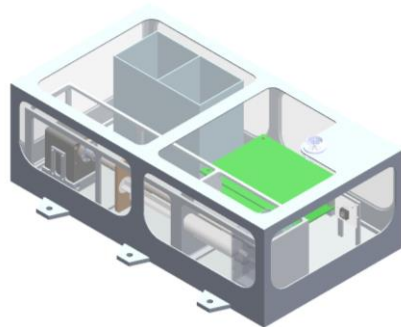


SPACE ZAB



MAIDANA RESEARCH

Engineering Design and Scientific Research





# National Space Exploration Project of GISTDA

Driving Thailand to develop economic and industry by Space Technology Utilization and New knowledge.

## Space Experiment Mission

- Call for Space Scientific Proposals
- Scientific Payload Box
- Space Innovation
- Microgravity Experiment Laboratory
- Thai Astronaut Opportunity
- Space Exploration Cooperation

## Future Works

- Mars & Moon Rovers
- Sub-orbital Launching Vehicle
- Spaceflight Orbiter
- Manned Space Program
- International Spaceport
- Etc.

