

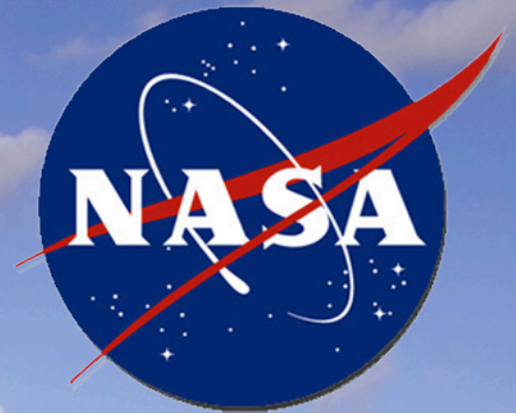


Mark Helmlinger
Remote Sensing Calibration,
Characterization, and Validation Specialist
Jet Propulsion Laboratory
Pasadena, CA



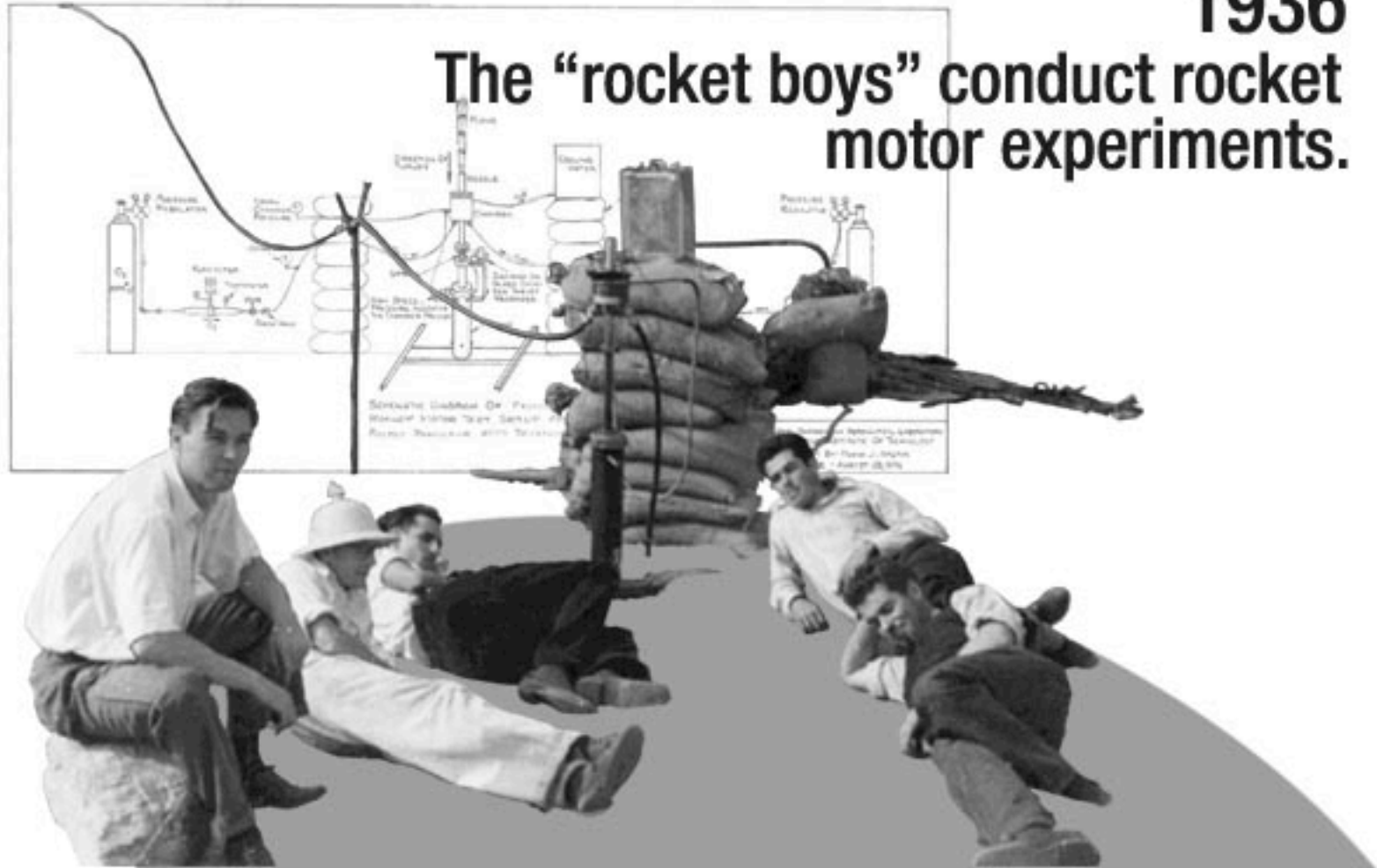


JPL



1936

The “rocket boys” conduct rocket motor experiments.



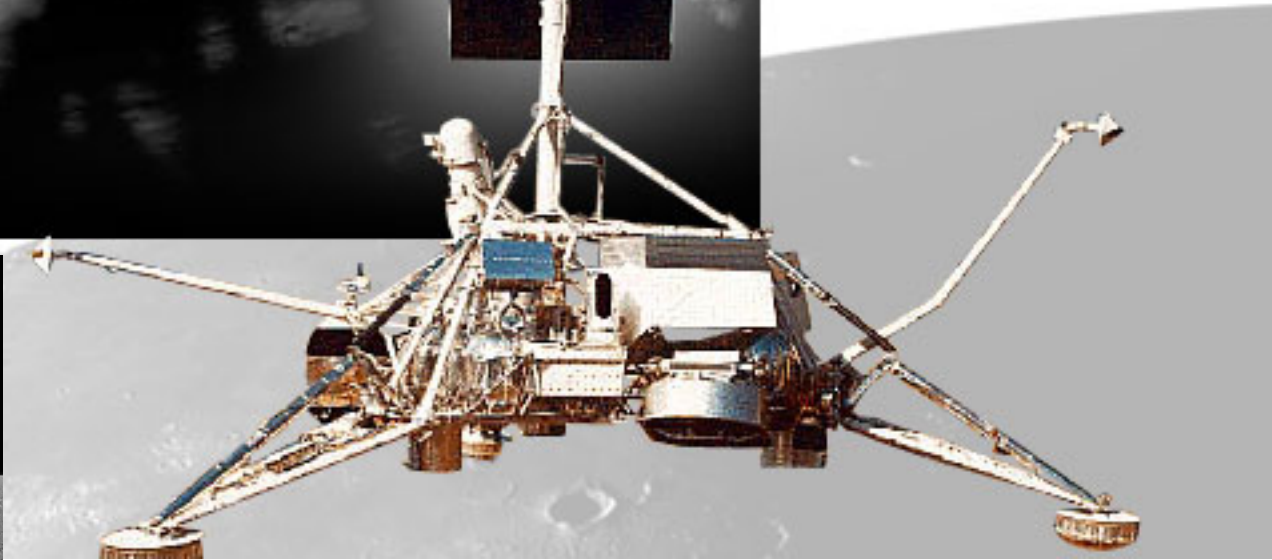
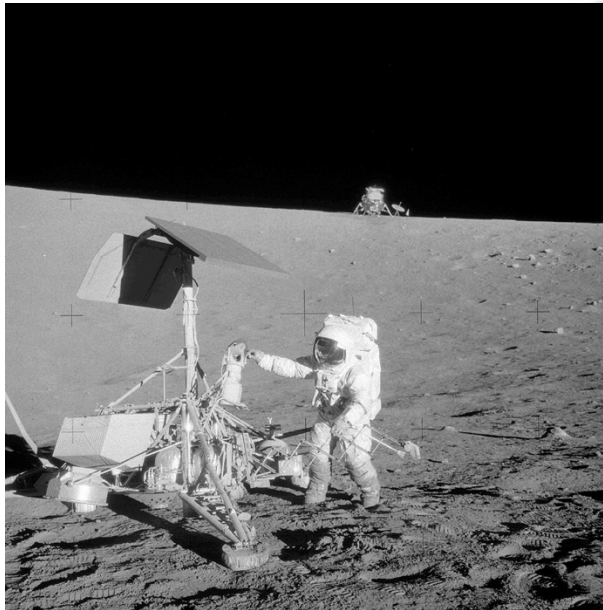
1940 Theodore Von Karman has test stands built in the Arroyo Seco – 1941 first Army funding for JATO development – 1943 JPL is named by Von Karman, JPL’s first director – WWII & Early Cold War guided missile development.

1958
Explorer 1 becomes
first U.S. satellite.



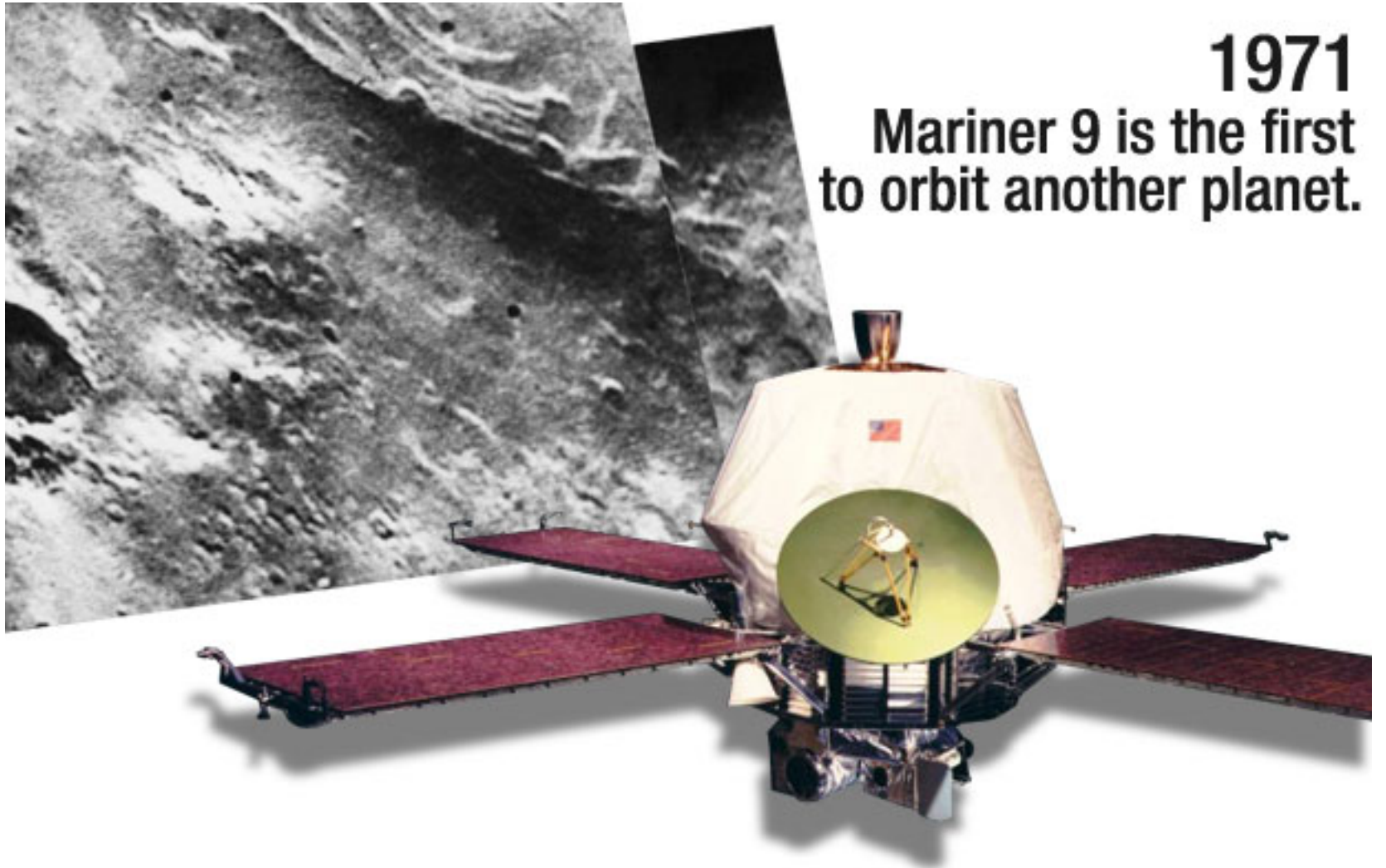
**December 1958 Director Pickering convinces Eisenhower Administration to allow transfer of JPL from Army to NASA
And the adventure begins . . .**

1966
Surveyor 1 lands
on the moon.



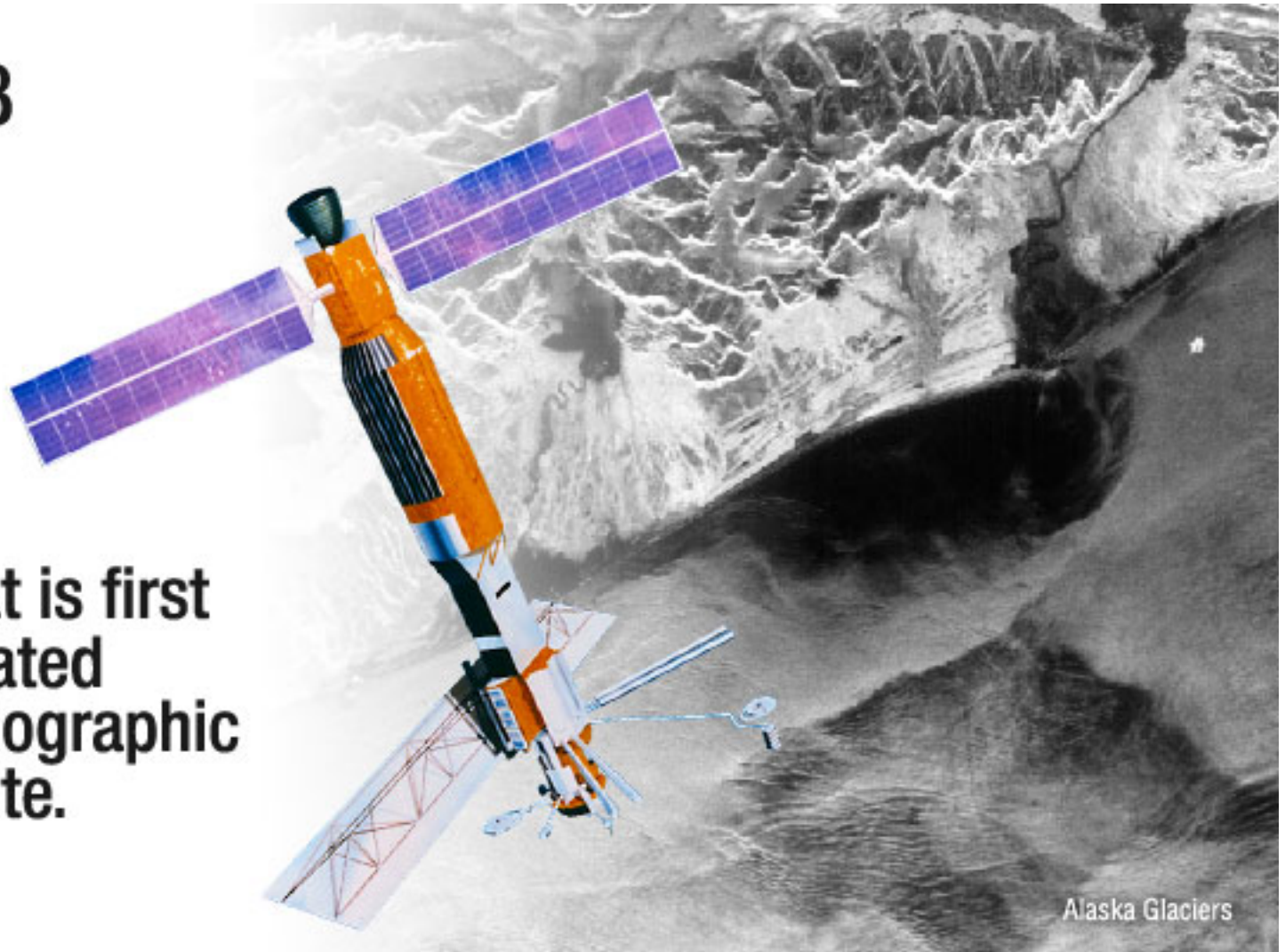
1971

**Mariner 9 is the first
to orbit another planet.**



1978

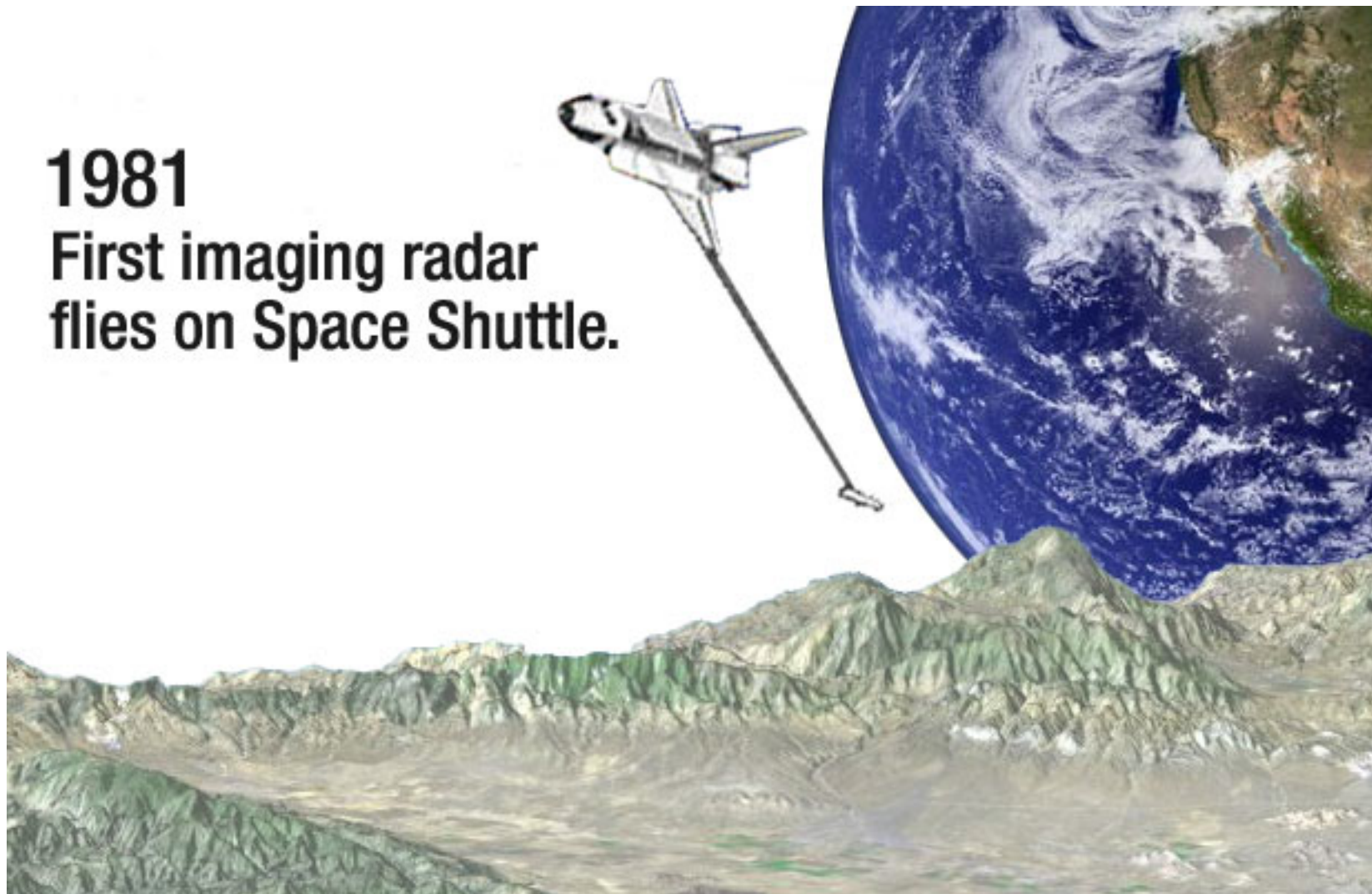
**Seasat is first
dedicated
oceanographic
satellite.**



Alaska Glaciers

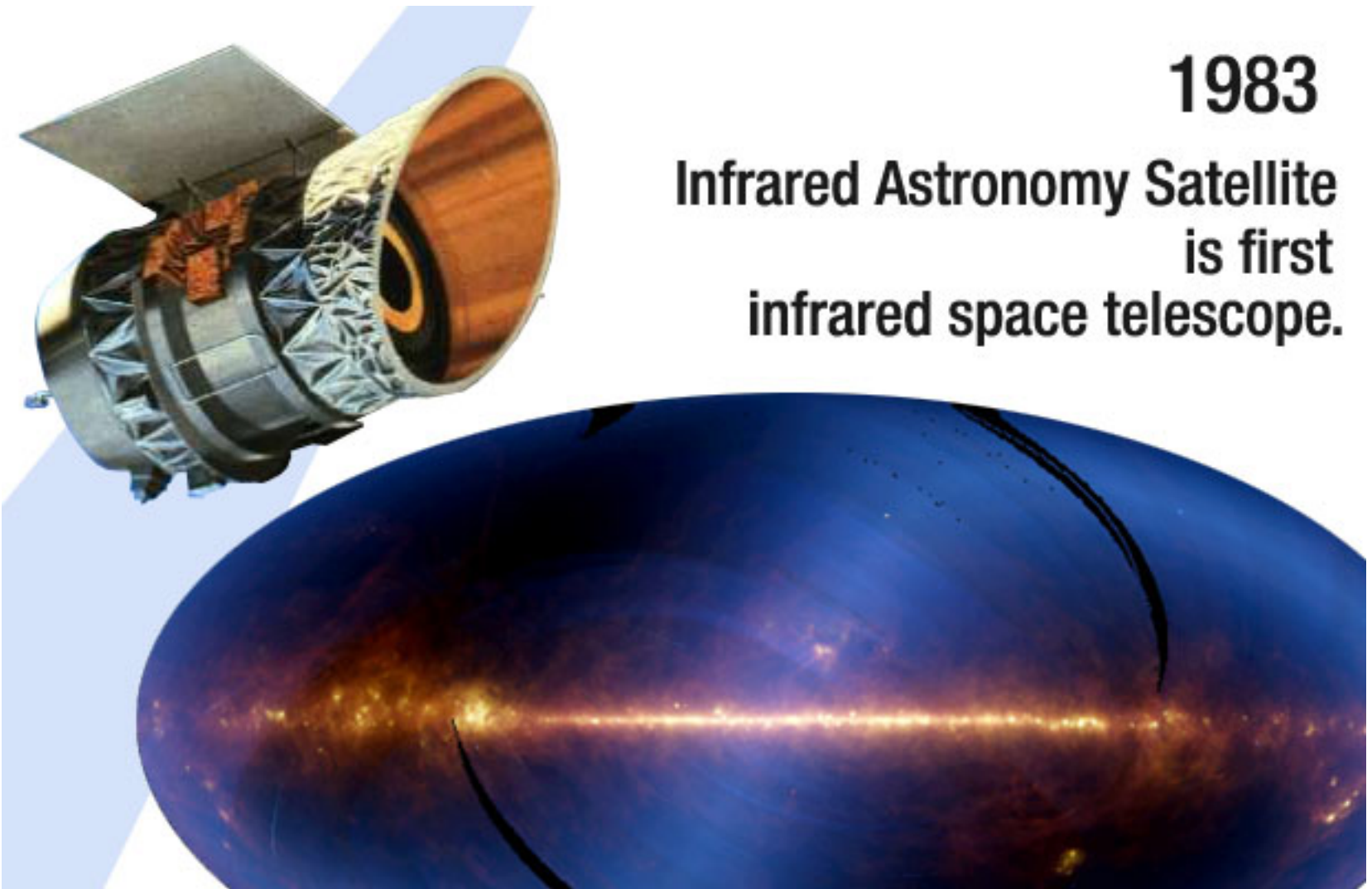
1981

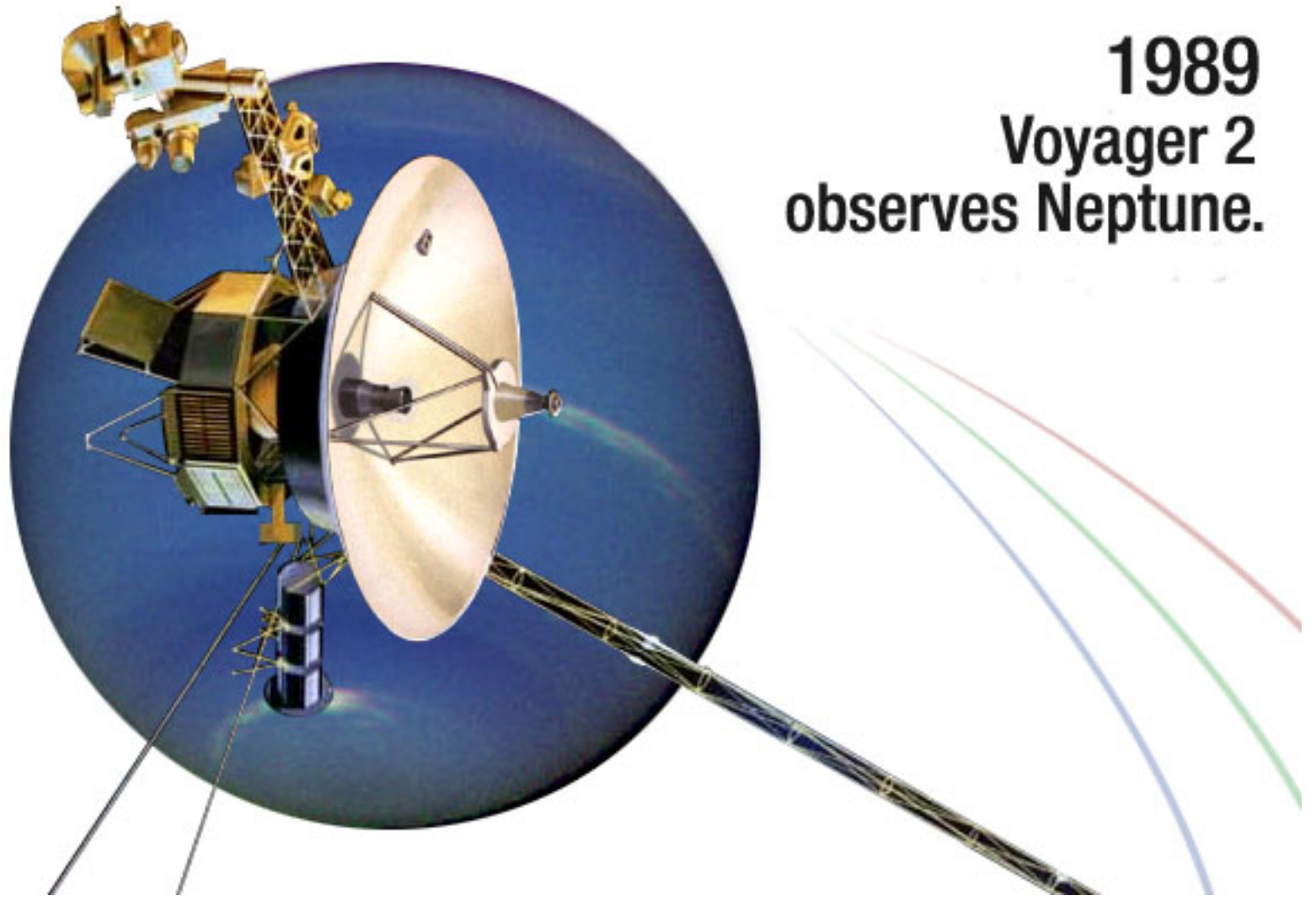
**First imaging radar
flies on Space Shuttle.**



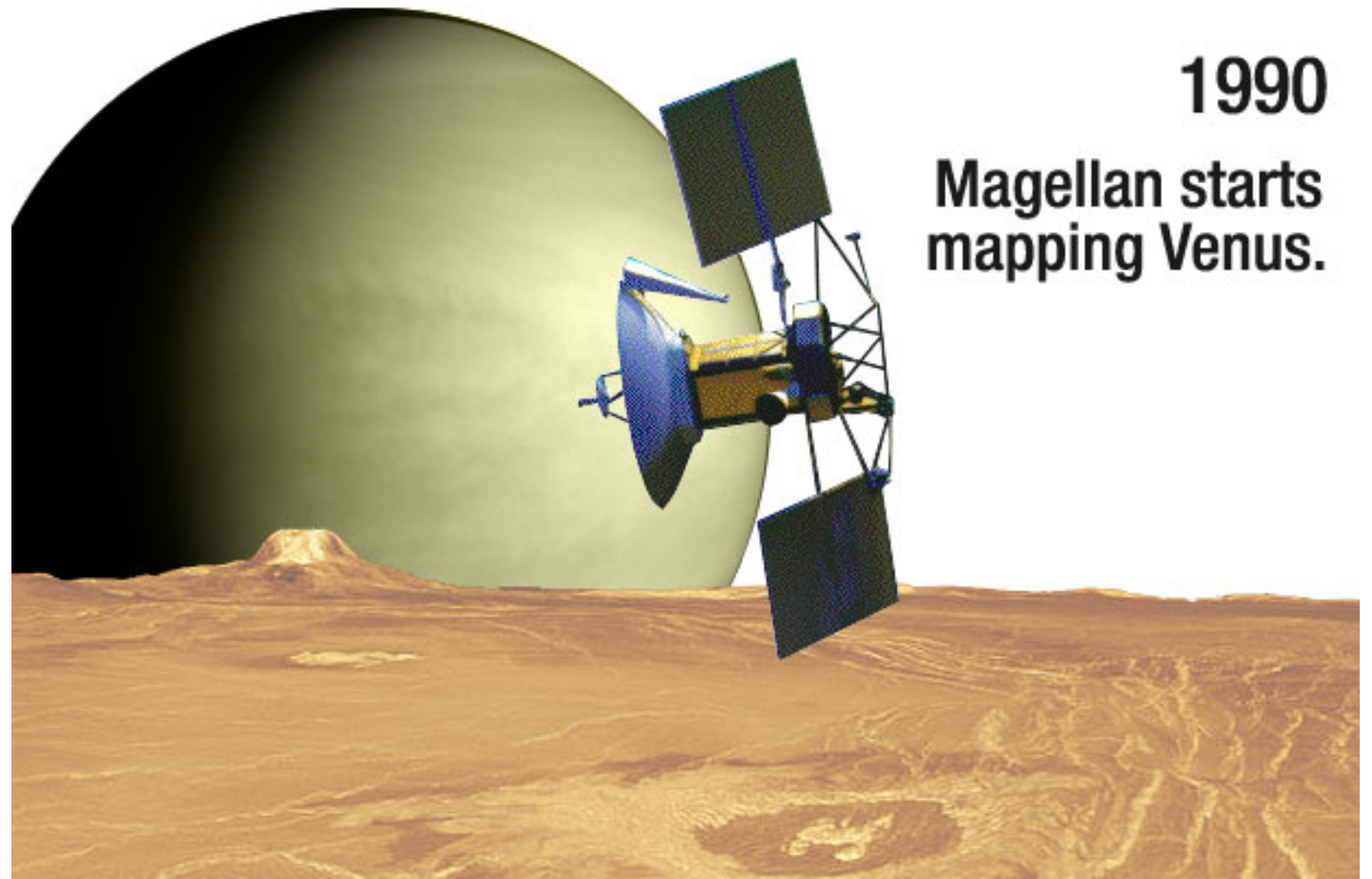
1983

**Infrared Astronomy Satellite
is first
infrared space telescope.**





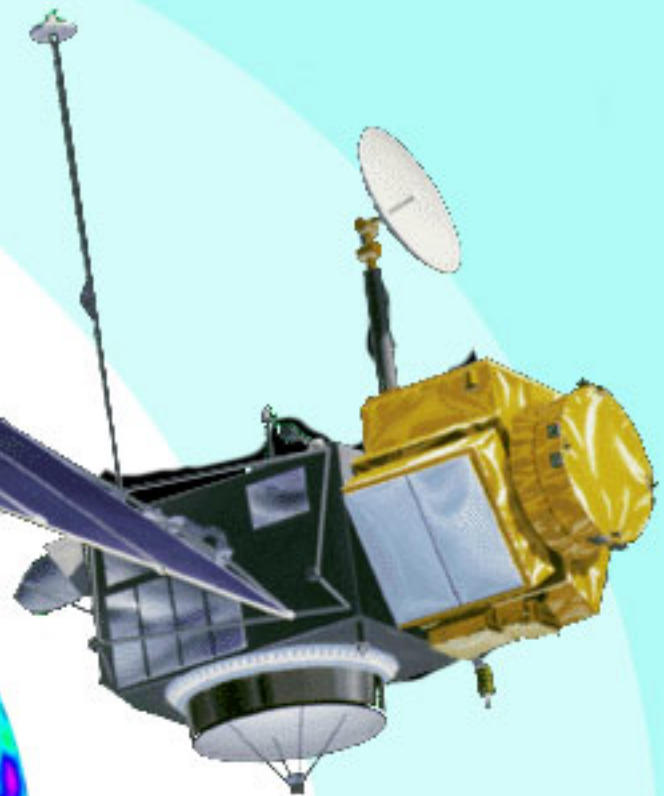
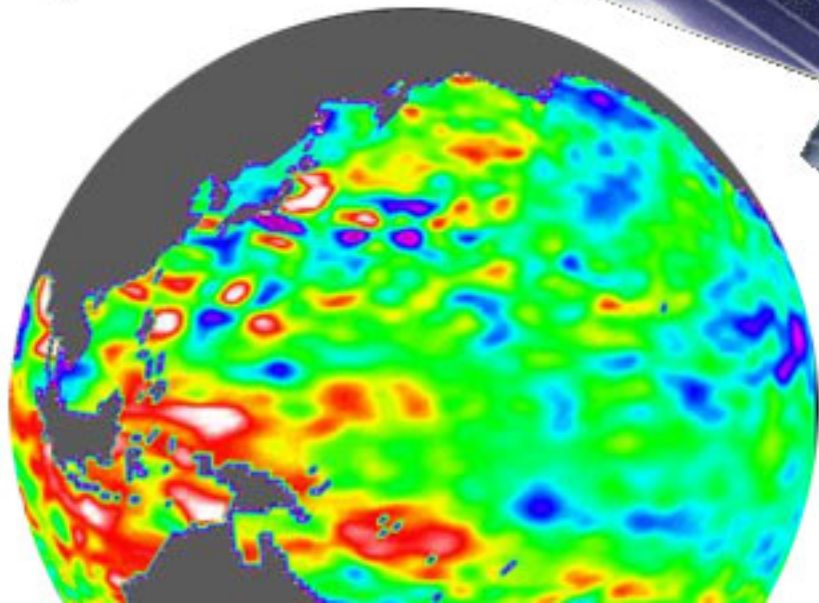
1989
Voyager 2
observes Neptune.



1990

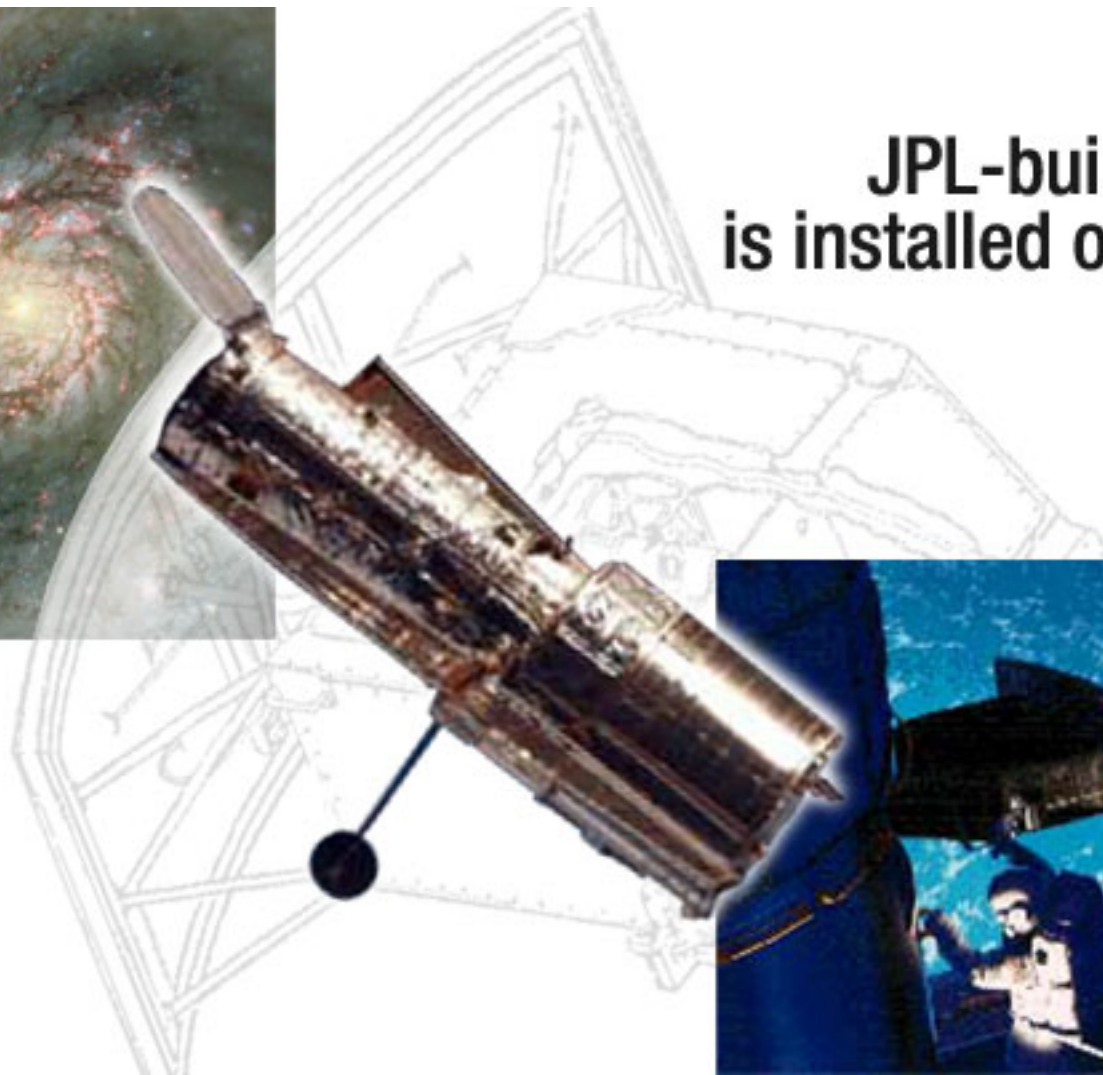
**Magellan starts
mapping Venus.**

1992
Topex/Poseidon
begins
ocean-observing
odyssey.

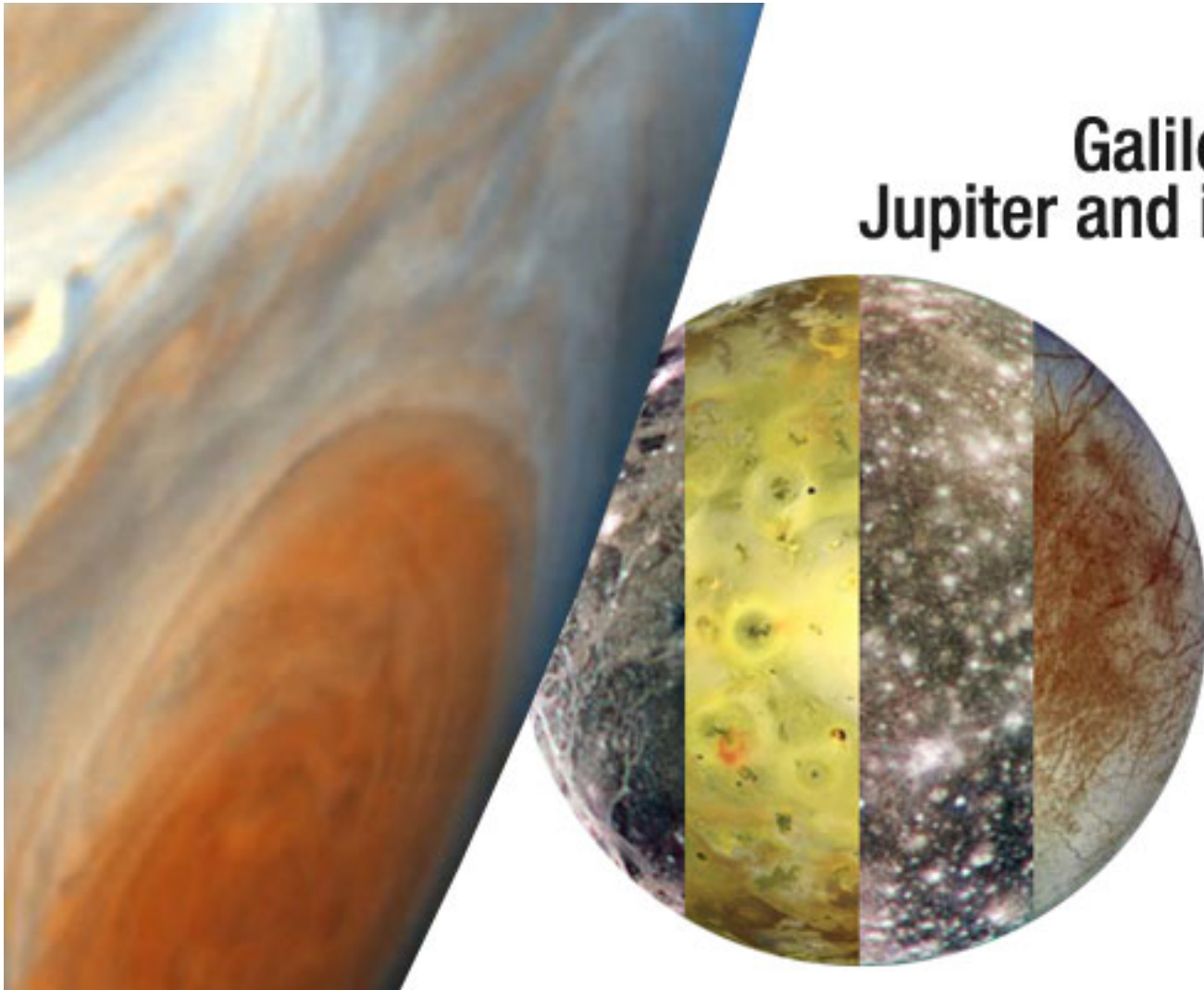




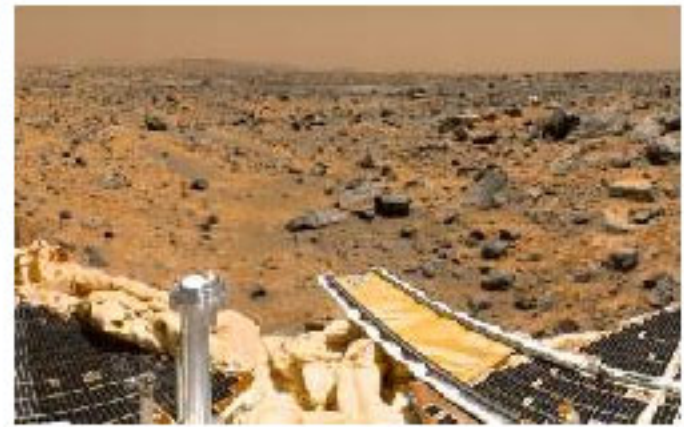
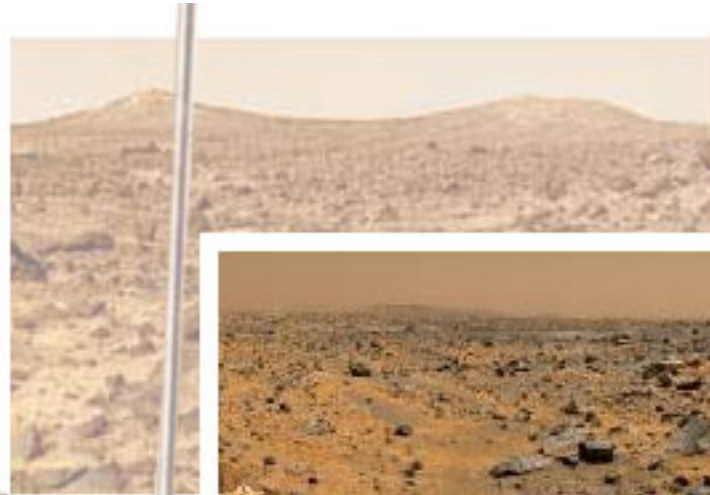
1993
JPL-built camera
is installed on Hubble.

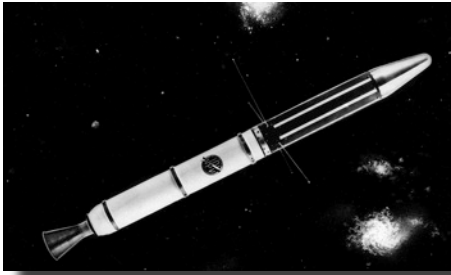


1995
Galileo studies
Jupiter and its moons.



1997
Pathfinder
and
Sojourner rover
explore Mars.

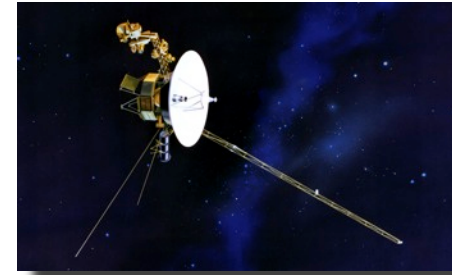




1st U.S. satellite
Explorer 1 - Jan 28, 1958



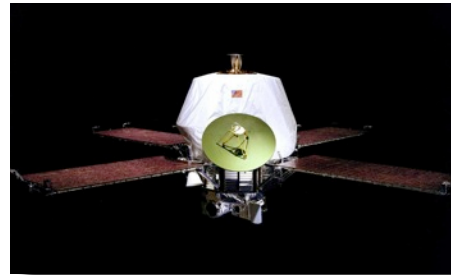
1st close-up images of
another planet
Mariner 4 to Mars - Nov 1964



1st fly-bys of Neptune and Uranus
Voyager 2 - 1986 & 1989



1st U.S. spacecraft to the moon
Ranger 7 - Jul 28, 1964



1st orbiter at another planet
Mariner 9 to Mars - May 1971



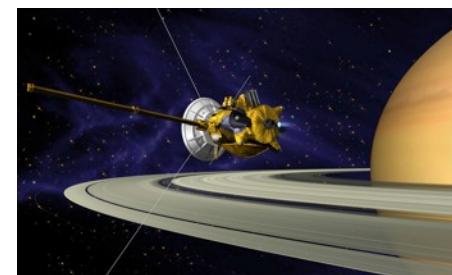
1st orbiter at Jupiter
Galileo 1979 - 1989



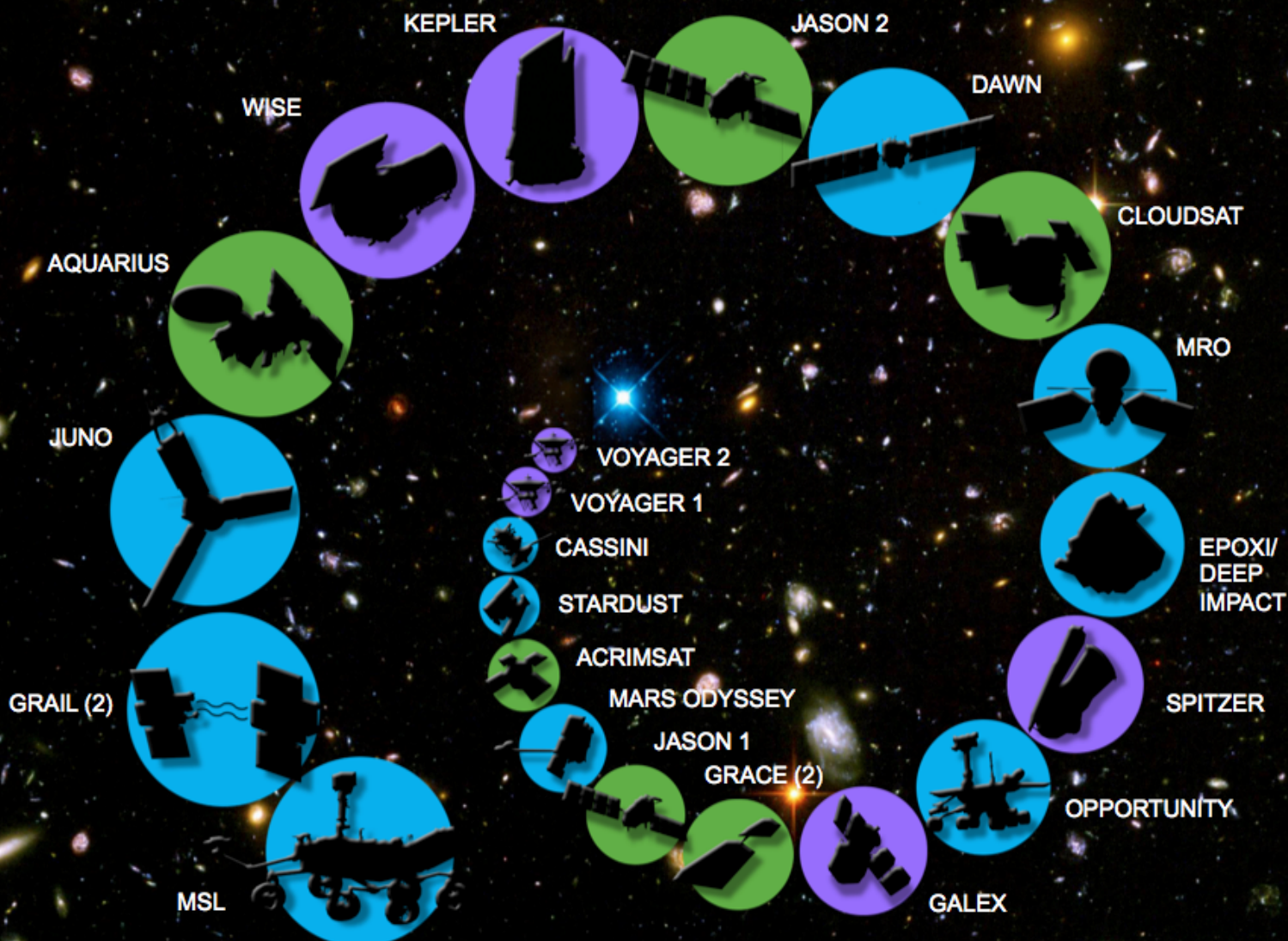
1st planetary mission
Mariner 2 to Venus - Jan 28, 1958



1st gravity assist mission
Mariner 10 to Venus - Feb 5, 1974



1st orbiter at Saturn
Cassini 2004 - present



INSTRUMENTS

Earth Science

- ASTER
- MISR
- TES
- MLS
- AIRS

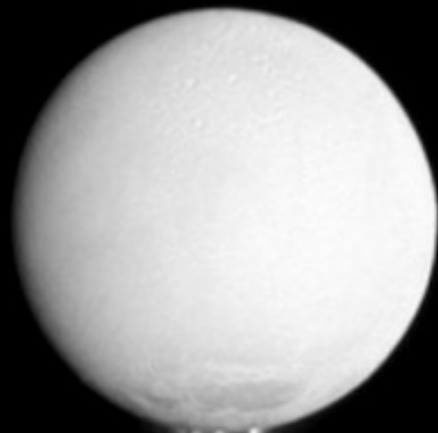
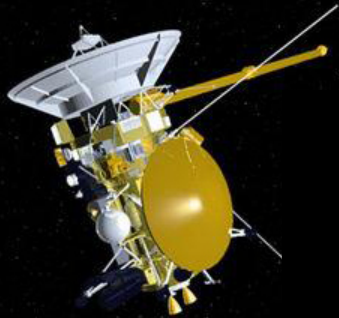
Planetary

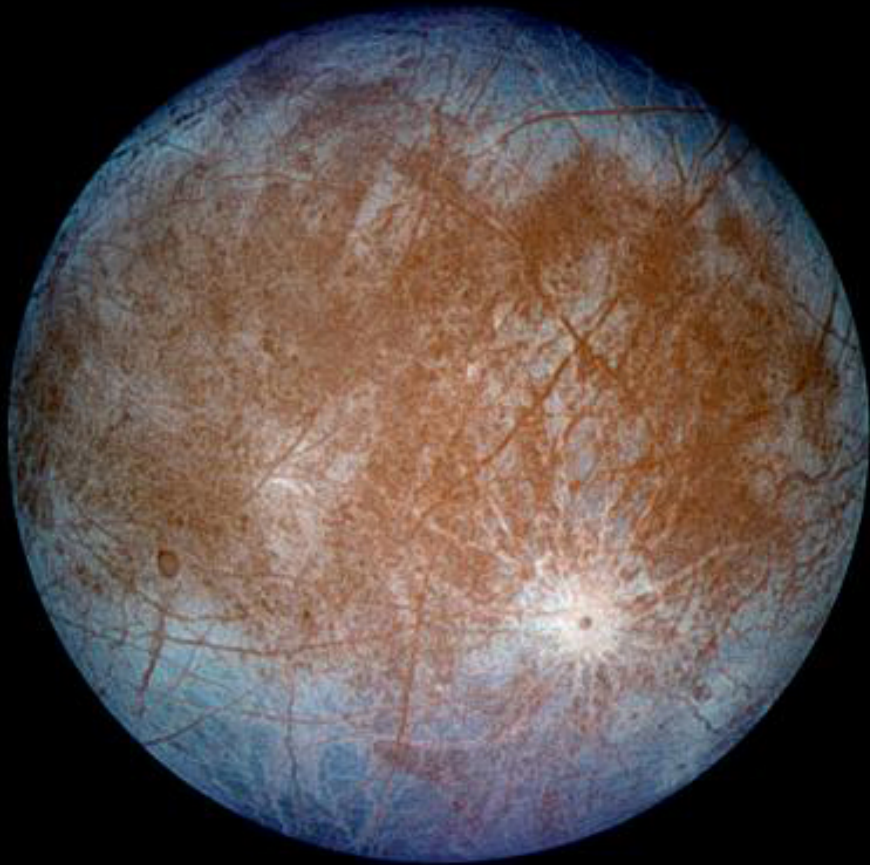
- MIRO
- Diviner
- MARSIS

Astrophysics

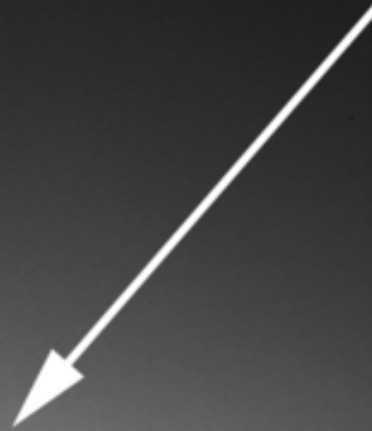
- Herschel
- Planck







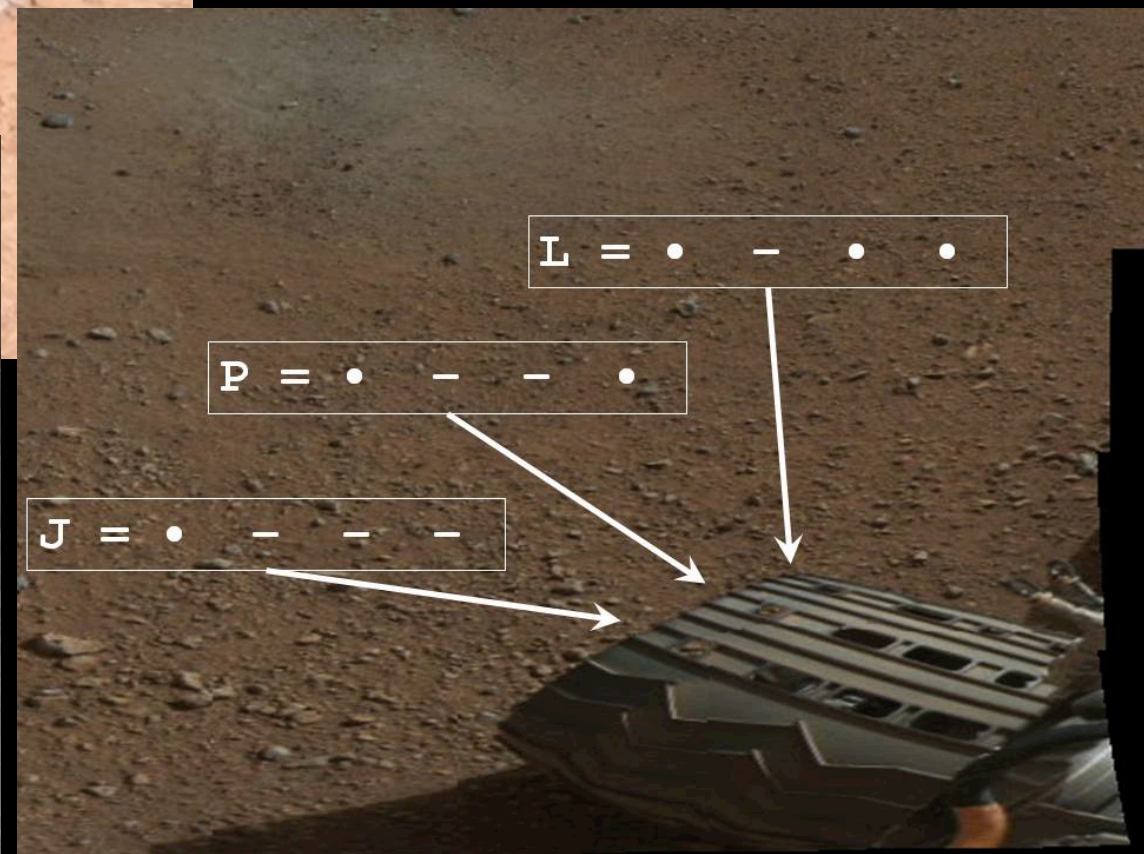
You are here

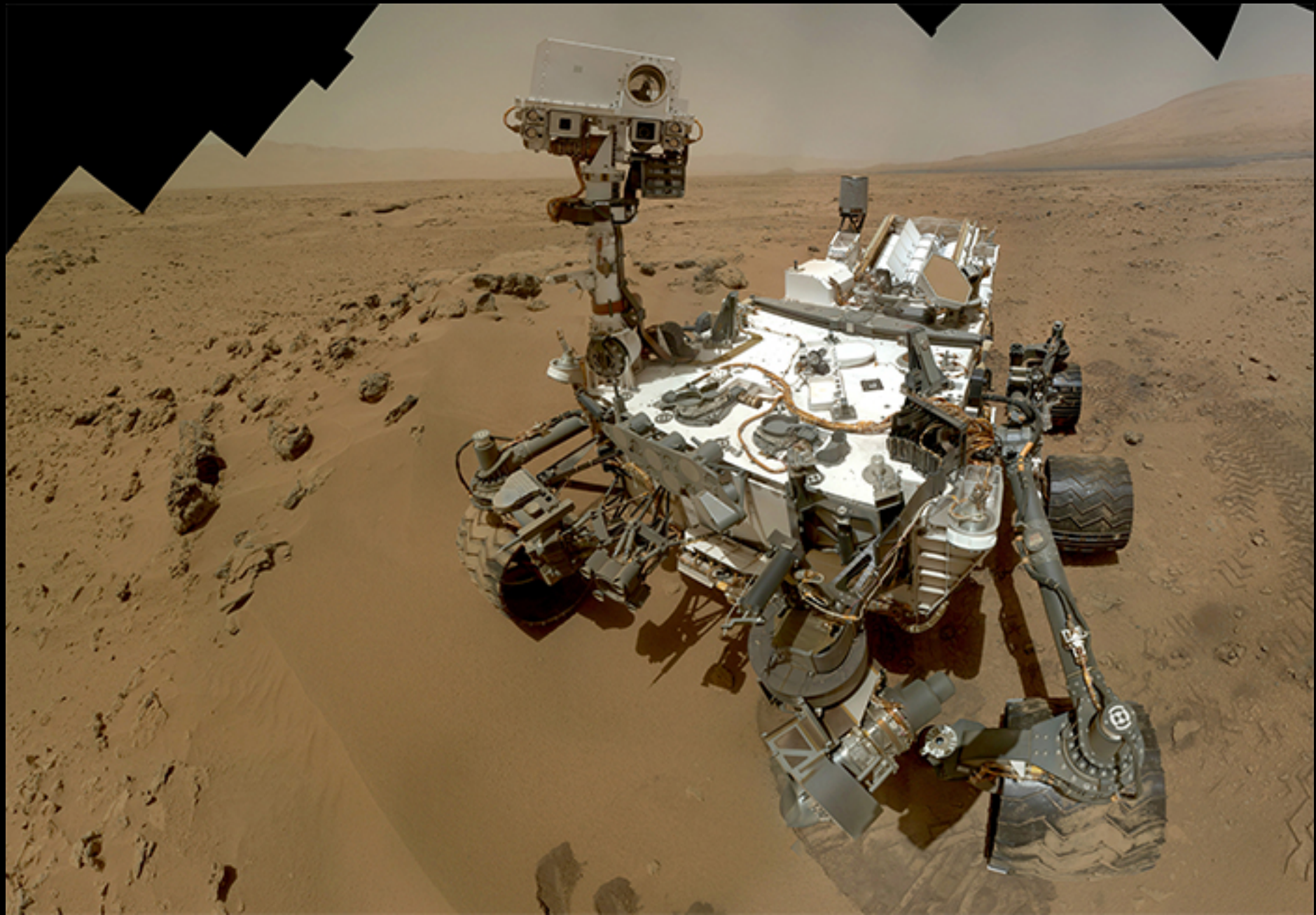


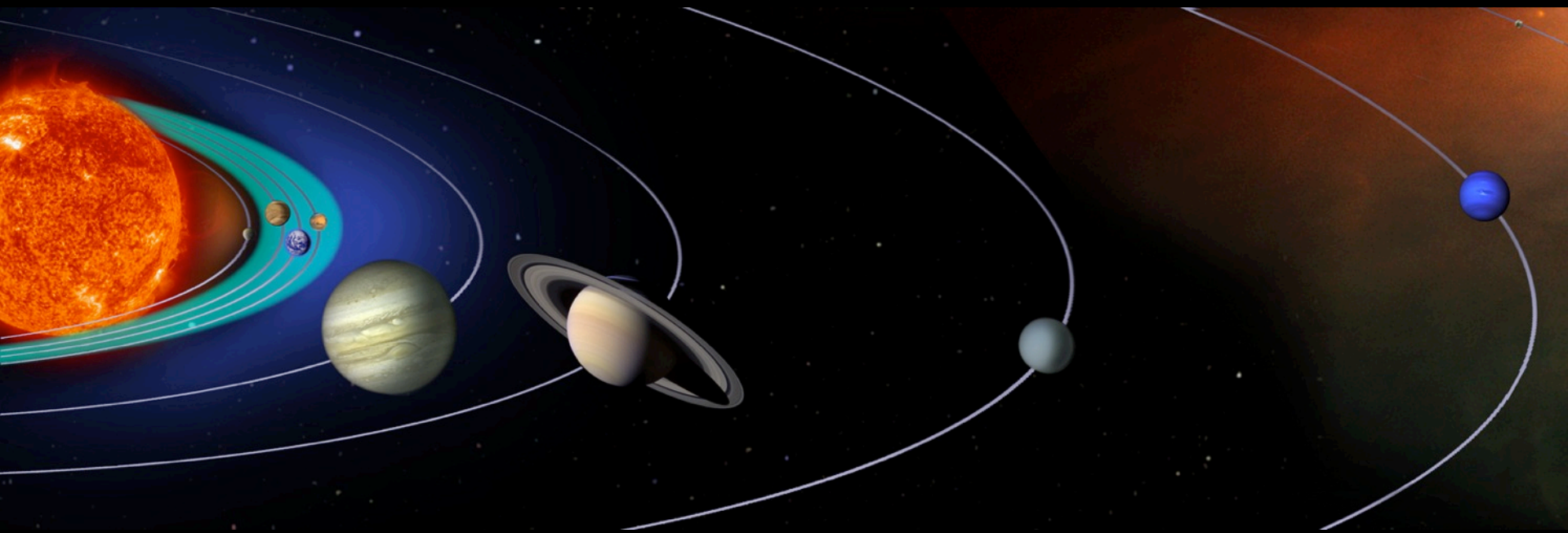
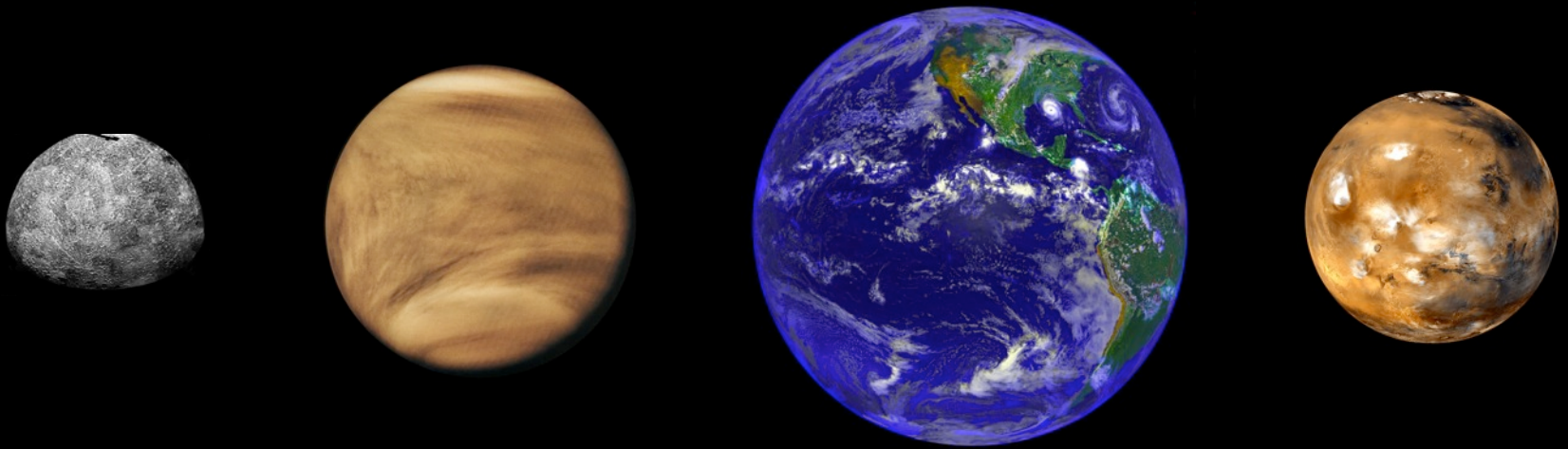


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The JPL logo is rendered in a bold, red, sans-serif font. The letters are thick and blocky, with the 'J' and 'L' having a distinctive shape where the bottom bar is slightly wider than the top. The logo is centered horizontally in the upper half of the image.

JPL

www.jpl.nasa.gov



The JPL logo is rendered in a bold, red, sans-serif font. The letters are thick and blocky, with the 'J' and 'L' having a distinctive shape where the bottom bar is slightly wider than the top. The logo is centered horizontally in the upper half of the image.

JPL

Backup Slides



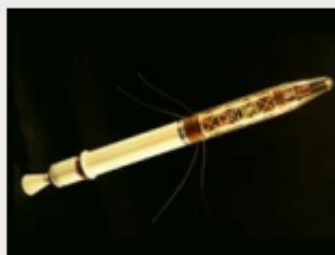


Explorer 1

Explorer 1 became the first successfully launched satellite by the United States when it was sent to space on January 31, 1958.

01/31/1958

Earth



Explorer 2

Explorer 2 was the second satellite of the notable Explorer mission series that launched the United States into the Space Age, however, it did not reach the same success as its predecessor, Explorer 1.

03/05/1958

Earth

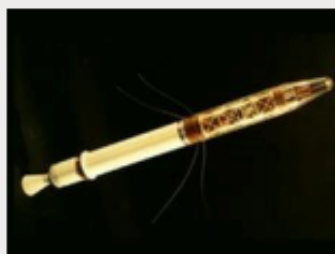


Explorer 3

Explorer 3 was the third satellite of the Explorer mission series and the first successful follow-on to Explorer 1, which made history when in January 1958 it became the United States' first space satellite.

03/26/1958

Earth



Explorer 4

Explorer 4 was designed to further investigate the radiation belt around Earth, discovered during the Explorer 1 and 3 missions.

07/26/1958

Earth



Explorer 5

The Explorer 5 mission was the last of the original series of Explorer satellites designed, built and operated by NASA's Jet Propulsion Laboratory.

08/24/1958

Earth





Pioneer 3

The Pioneer 3 mission was one of the first attempts by the United States to send a spacecraft to the moon.

12/06/1958

Moon



Pioneer 4

The Pioneer 4 mission was the second of two early attempts by the United States to send a spacecraft to the moon.

03/03/1959

Moon



Ranger 1

Ranger 1, the first of a series of nine spacecraft launched in the early 1960s to explore the moon, was a test spacecraft built as a prelude to future lunar missions.

08/23/1961

Earth



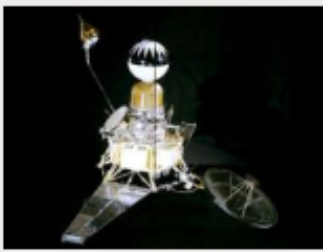
Ranger 2

The second of the series of spacecraft launched by NASA's Jet Propulsion Laboratory in the early 1960s to further lunar and interplanetary exploration, Ranger 2, like its predecessor, was built to test flight systems for a future lunar mission.

11/18/1961

Moon



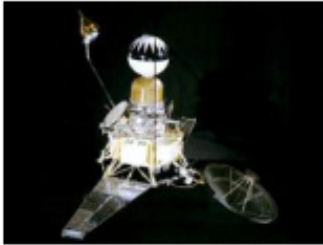


Ranger 3

Ranger 3 was NASA's first attempt to land a spacecraft on the moon.

01/26/1962

Moon



Ranger 4

The Ranger 4 spacecraft, which was designed to collect data on interplanetary space, photograph the moon up close and make a rough landing on the lunar surface, was the first American spacecraft to reach another celestial body.

04/23/1962

Moon

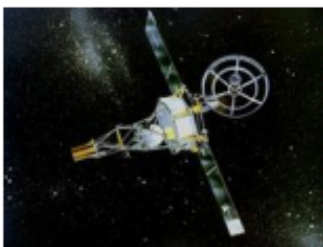


Mariner 1

The first attempt by the United States to send a spacecraft to Venus, Mariner 1 was destroyed by the range safety officer about 290 seconds after launch when it veered off course.

07/22/1962

Venus



Mariner 2

Mariner 2 became the first successful mission to another planet when it flew by Venus on December 14, 1962.

08/27/1962

Venus

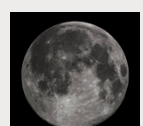


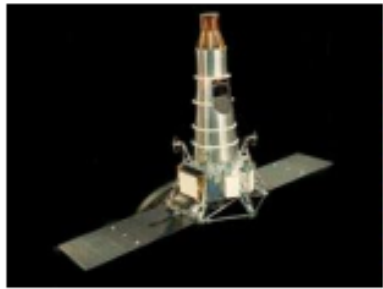
Ranger 5

The third attempt by the United States to land a spacecraft on the moon, Ranger 5 was designed to collect data on interplanetary space, photograph the moon up close and make a rough landing on the lunar surface.

10/18/1962

Moon



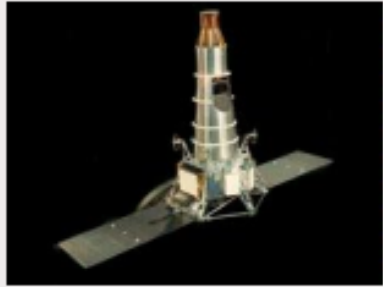


Ranger 6

Ranger 6 was principally designed to transmit high-resolution photographs of the moon before impacting the lunar surface and was part of the series of nine Ranger spacecraft launched in the early 1960s to explore the moon.

01/30/1964

Moon



Ranger 7

The Ranger 7 lunar lander was the first true success in the United States' early quest to explore the moon and heralded a new era of exploration that saw dramatically more mission successes than failures.

07/28/1964

Moon

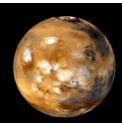


Mariner 3

Mariner 3 was designed to fly by Mars and conduct other interplanetary experiments along the way.

11/05/1964

Mars



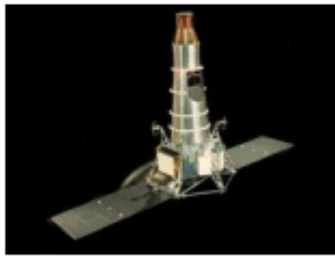
Mariner 4

One of the great successes of the early American space program, the Mariner 4 mission journeyed to Mars -- making its closest approach on July 15, 1965 -- and took the first photos of another planet from space.

11/28/1964

Mars



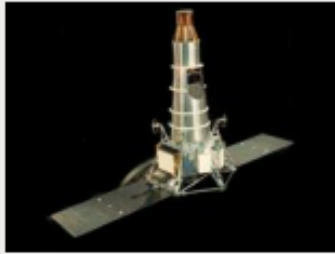


Ranger 8

Following on the success of the Ranger 7 mission, which was the first United States spacecraft to photograph the moon up close, Ranger 8 took more than 7,000 high-resolution images of the moon before impacting the lunar surface on February 20, 1965.

02/17/1965

Moon



Ranger 9

Ranger 9 was the last of the Ranger series of spacecraft launched in the 1960s to explore the moon and was designed to image and impact the moon's crater Alphonsus, which was thought to be the site of recent lunar volcanic activity.

03/21/1965

Moon



Surveyor 1

Surveyor 1, the first of a series of seven robotic spacecraft sent to the moon to gather data in preparation for NASA's Apollo missions, was the first spacecraft to make a true soft landing on the moon.

05/30/1966

Moon



Surveyor 2

Surveyor 2 was designed as a follow-on to the highly successful Surveyor 1 mission and was the second of seven moon landers tasked with collecting lunar data in preparation for NASA's Apollo missions.

09/20/1966

Moon



Surveyor 3

After Surveyor 1's initial studies of the lunar surface in 1966, Surveyor 3 made further inroads into preparations for human missions to the moon.

04/17/1967

Moon





Mariner 5

Originally built as a backup to the Mariner 4 spacecraft, which successfully journeyed to Mars in 1965, Mariner 5 was modified to fly by Venus and collect data on the planet's atmosphere, radiation and magnetic field.

06/14/1967

Venus



Surveyor 4

Despite a perfect flight to the moon, Surveyor 4, which was designed to conduct further studies of the lunar surface in preparation for the upcoming Apollo missions, met an untimely end just 2.5 minutes before landing on the moon.

07/14/1967

Moon



Surveyor 5

Equipped with a chemical element analyzer for conducting analyses of the lunar soil, the Surveyor 5 lander was the first spacecraft to do a soil analysis on the moon, or any other world.

09/08/1967

Moon



Surveyor 6

Part of the highly successful series of lunar landers sent to the moon to examine the feasibility of a future human mission, Surveyor 6 was the first spacecraft to be launched from the surface of the moon.

11/07/1967

Moon

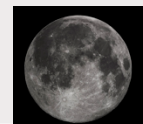


Surveyor 7

Surveyor 7 was the last of the original series of Surveyor moon landers of the late 1960s and was dedicated primarily to scientific investigations.

01/07/1968

Moon



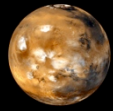


Mariner 6

Along with its twin Mariner 7 spacecraft, Mariner 6 was designed to make a close flyby of Mars to study the surface for signs of life and develop technology for future missions.

02/25/1969

Mars

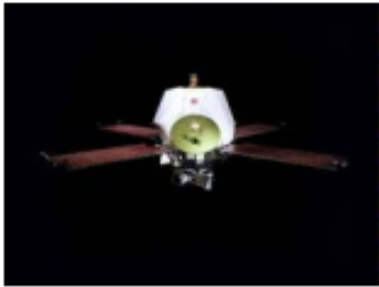
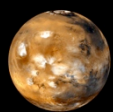


Mariner 7

The Mariner 7 spacecraft made a close flyby of Mars just five days after its twin spacecraft, Mariner 6, in 1969.

03/27/1969

Mars

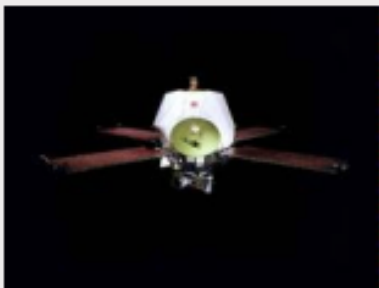
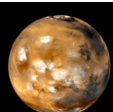


Mariner 8 (Mariner H)

Designed to be the first American spacecraft to study the Red Planet from a Martian orbit, Mariner 8 (also called Mariner H) fell victim to a malfunction in the stage's flight-control system shortly after launch.

05/08/1971

Mars



Mariner 9 (Mariner I)

In 1971, the Mariner 9 spacecraft beat the Soviet Mars 2 to the Red Planet to become the first spacecraft to orbit another planet.

05/30/1971

Mars



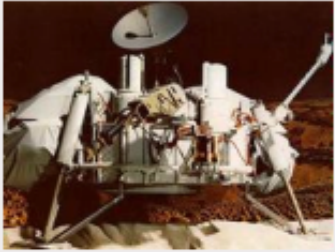
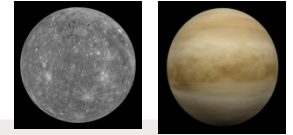


Mariner 10

The first mission to employ gravity assist, or using the gravity of a planet to alter a spacecraft's speed and trajectory to fly by its target planet, the Mariner 10 mission flew by both Venus and Mercury, snapping photos and collecting data.

11/03/1973

Mercury, Venus



Viking 1

The first spacecraft to successfully land on Mars, Viking 1 was part of a two-part mission to investigate the Red Planet and search for signs of life.

08/20/1975

Mars



Viking 2

Viking 2 landed on Mars in November 1976 -- immediately following the first successful spacecraft landing on Mars by Viking 1 -- and was part of NASA's early two-part mission to investigate the Red Planet and search for signs of life.

09/09/1975

Mars

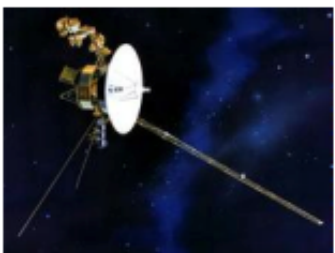
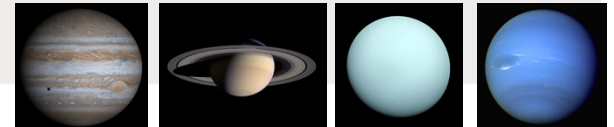


Voyager 2

The Voyager 2 spacecraft, which has been in operation since 1977 and is the only spacecraft to have ever visited Uranus and Neptune, is currently making its way to interstellar space, where its twin spacecraft, Voyager 1, has resided since August 2012.

08/20/1977

Jupiter, Saturn, Uranus, Neptune



Voyager 1

Voyager 1 reached interstellar space in August 2012 and is the most distant human-made object in existence.

09/05/1977

Jupiter, Saturn



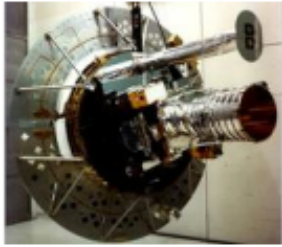


Seasat

One of the earliest Earth-observing satellites, Seasat was designed to test various oceanographic sensors and gain a better understanding of Earth's seas.

06/27/1978

Earth

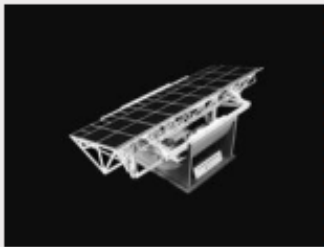


Solar Mesosphere Explorer

The Solar Mesosphere Explorer was an Earth-orbiting spacecraft designed to investigate the processes that create and destroy the ozone in Earth's upper atmosphere, or mesosphere.

10/06/1981

Earth

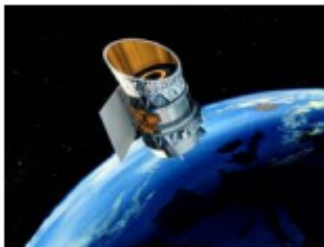


Shuttle Imaging Radar-A

Designed to fly aboard NASA's Space Shuttle Columbia, STS-2, Shuttle Imaging Radar-A was the first in a series of instruments that imaged Earth using radar pulses, rather than optical light, as illumination.

11/12/1981

Earth

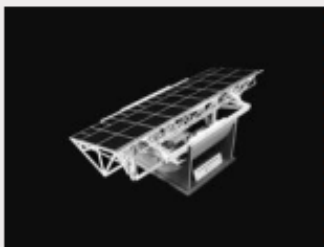


Infrared Astronomical Satellite

The Infrared Astronomical Satellite, or IRAS, was the first mission to put a telescope in space to survey the sky in infrared.

01/25/1983

Universe



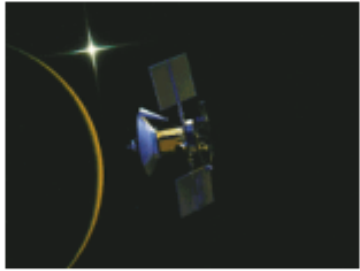
Shuttle Imaging Radar-B

Shuttle Imaging Radar-B, the second in a series of NASA Earth-imaging instruments employing radar technology, was designed to fly aboard NASA's Space Shuttle Challenger, STS-41-G, to collect radar images of Earth at several angles.

10/05/1984

Earth



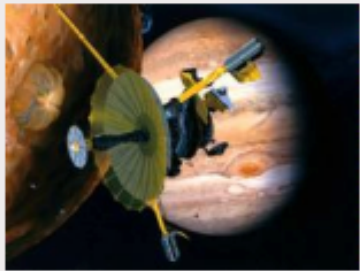


Magellan

The Magellan spacecraft, which arrived at Venus in 1990, made the first global map of the surface of Venus as well as global maps of the planet's gravity field.

05/04/1989

Venus

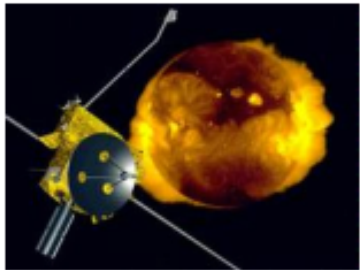


Galileo

While its aim was to study Jupiter and its mysterious moons, which it did with much success, NASA's Galileo mission also became notable for discoveries during its journey to the gas giant.

10/18/1989

Jupiter, Venus, asteroid Gaspra, asteroid Ida

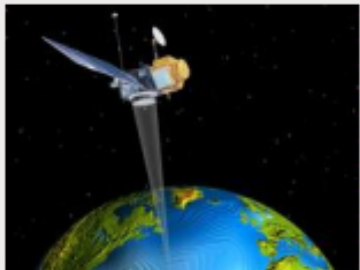


Ulysses

The Ulysses spacecraft was designed as a five-year mission to study the never-before-examined north and south poles of the Sun.

10/06/1990

Sun



Topex / Poseidon

An Earth satellite designed to measure ocean surface topography with unprecedented accuracy, Topex/Poseidon spent 13-plus years in orbit improving understanding of ocean circulation and its impact on global climate.

08/10/1992

Earth



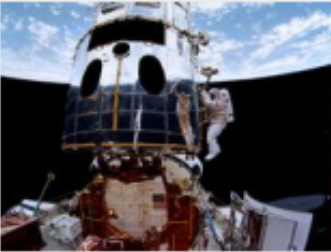
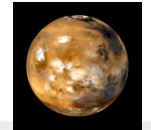


Mars Observer

The Mars Observer was based on a commercial Earth-orbiting spacecraft and designed to study and take high-resolution photography of the Martian surface.

09/25/1992

Mars

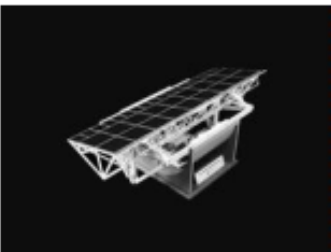


Wide Field and Planetary Camera 2

Also known as "the camera that saved Hubble," the Wide Field and Planetary Camera 2, or WFPC2, served as the principal imaging instrument on the Hubble Space Telescope for 25-plus years, producing more than 135,000 of the most stunning photographs of the universe ever seen.

12/09/1993

Universe

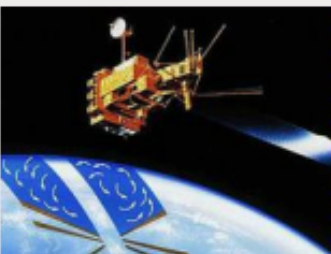


Spaceborne Imaging Radar-C / X-Band Synthetic Aperture Radar

First launched a decade after its predecessors, Spaceborne Imaging Radar-C was coupled with the German-built X-Band Synthetic Aperture Radar to image Earth in three different wavelengths.

04/09/1994

Earth



NASA Scatterometer

Designed to gather data on the speed and direction of winds that cause ocean waves, the NASA Scatterometer instrument flew aboard Japan's Advanced Earth Observation Satellite, or ADEOS.

08/16/1996

Earth

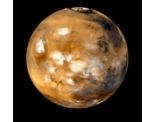


Mars Global Surveyor

The Mars Global Surveyor orbiter, which operated on Mars for more than nine years, was designed to study the composition of Mars, map its topography and monitor weather patterns.

11/07/1996

Mars



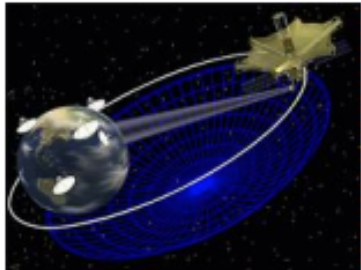
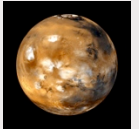


Mars Pathfinder /
Sojourner Rover

The Mars Pathfinder mission, designed to demonstrate a low-cost method for delivering a set of science instruments to the Red Planet, was the first wheeled vehicle to be used on any other planet in the solar system and served as the foundation for the Mars rovers of today.

12/04/1996

Mars

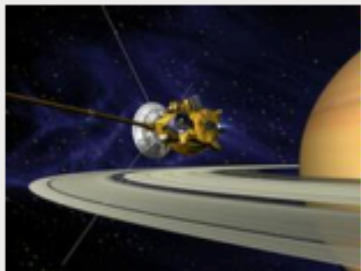


Space Very Long
Baseline
Interferometry

The Space Very Long Baseline Interferometry is a network of space- and Earth-based radio antennas that combine to create the equivalent of a telescope with a diameter more than two-and-a-half times the diameter of Earth.

02/12/1997

Universe

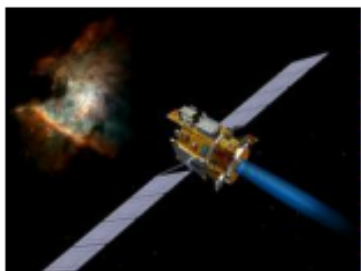


Cassini-Huygens

Orbiting the ringed planet Saturn and its numerous moons, the Cassini spacecraft has been and continues to be a keystone of exploration of the Saturnian system and the properties of gaseous planets in our solar system.

10/15/1997

Saturn



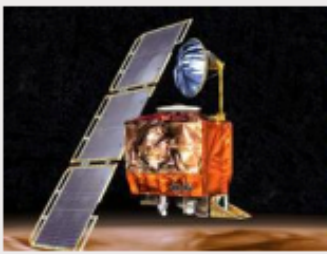
Deep Space 1

Originally designed to test a dozen new technologies including the use of an ion engine for spacecraft propulsion, Deep Space 1 far outstripped its primary mission goals by also successfully flying by the asteroid 9969 Braille and comet Borelly.

10/24/1998

asteroid 9969
Braille, comet
Borelly



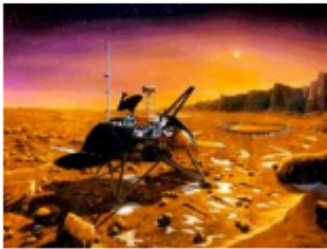
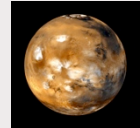


Mars Climate Orbiter

Designed to study Mars from orbit and serve as a communications relay for the Mars Polar Lander and Deep Space probes, the Mars Climate Orbiter was unsuccessful due to a navigation error caused by a failure to translate English units to metric.

12/11/1998

Mars

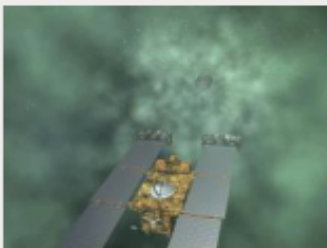
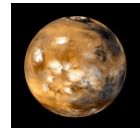


Mars Polar Lander / Deep Space 2

Designed to dig for water ice on Mars with a robotic arm, the Mars Polar Lander would have been the first-ever spacecraft to land on a polar region of the Red Planet.

01/03/1999

Mars

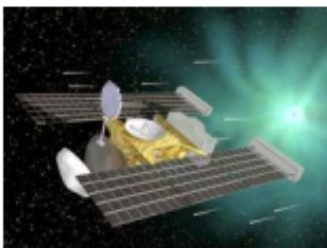


Stardust-NExT

Stardust-NExT was a follow-on mission that repurposed the Stardust spacecraft for a close re-encounter with comet Tempel 1 on Feb. 14, 2011.

02/07/1999

comet Tempel 1

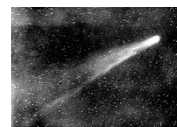


Stardust

Stardust was the first spacecraft to return a cometary sample and extraterrestrial material from outside the orbit of the moon to Earth.

02/07/1999

comet Wild-2

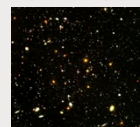


Wide-field Infrared Explorer

Designed as a four-month mission to study starburst galaxies, the Wide-Field Infrared Explorer, or WIRE, failed soon after launch due to a malfunction that caused the space telescope's coolant to be rapidly depleted.

03/05/1999

Universe



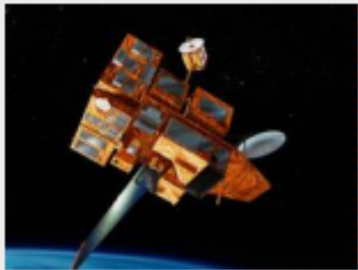


Quick Scatterometer

The Quick Scatterometer, or QuikScat, is an Earth satellite designed to provide valuable data on ocean winds that revolutionized environmental predictions and weather forecasting.

06/19/1999

Earth



SeaWinds

The SeaWinds instrument, which flies on NASA's Quick Scatterometer Earth satellite, is a specialized microwave radar that measures near-surface wind velocity and cloud cover over Earth's oceans.

06/19/1999

Earth

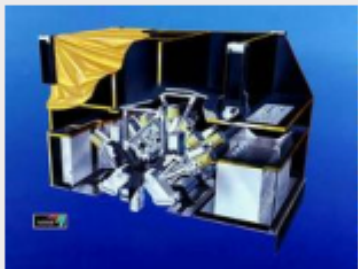


Advanced Spaceborne Thermal Emission and Reflection Radiometer

Designed to capture high-resolution images of Earth, the Advanced Spaceborne Thermal Emission and Reflection Radiometer, or ASTER, instrument is one of five instruments aboard NASA's Terra satellite.

12/18/1999

Earth



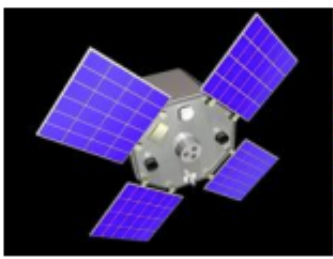
Multi-angle Imaging SpectroRadiometer

The Multi-angle Imaging SpectroRadiometer, or MISR, instrument is one of five instruments aboard NASA's Terra satellite, which is collecting important data on the causes and effects of global climate change.

12/18/1999

Earth





Active Cavity Irradiance Monitor Satellite

The Active Cavity Irradiance Monitor Satellite, or AcrimSat, mission is a climate change investigation that measures changes in how much of the sun's energy reaches Earth's atmosphere.

12/20/1999

Earth



Shuttle Radar Topography Mission

The Shuttle Radar Topography Mission, which flew aboard NASA's Space Shuttle Endeavour during an 11-day mission in 2000, made the first near-global topographical map of Earth, collecting data on nearly 80 percent of Earth's land surfaces.

02/11/2000

Earth

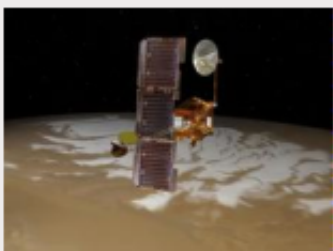


Keck Interferometer

The Keck Interferometer is a ground-based instrument that combines the light from the twin Keck telescopes to create an instrument equal in power to an 85-meter telescope that can detect and study stars and planets beyond our solar system.

03/12/2001

Universe

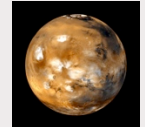


Mars Odyssey

With more than 10 years in orbit and counting, the 2001 Mars Odyssey spacecraft has spent more time in orbit around the Red Planet, collecting data on Mars' climate and geology, than any other spacecraft in history.

04/07/2001

Mars



Genesis

Designed to gain a better understanding of our cosmic origins, the Genesis spacecraft was launched in August 2001 to collect solar wind samples and return them to Earth for study.

08/08/2001

Solar Wind



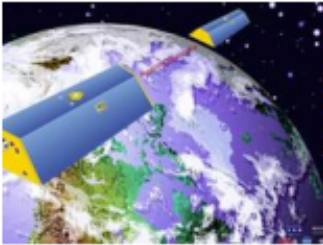


Jason 1

The Jason-1 Earth satellite, which for 11 years mapped sea level, wind speed and wave height for more than 95 percent of Earth's ice-free ocean, provided new insights into ocean circulation, tracked our rising seas and enabled more accurate weather, ocean and climate forecasts.

12/07/2001

Earth



Gravity Recovery and Climate Experiment

An award-winning mission that's changed the way we study Earth's gravitational forces, the Gravity Recovery and Climate Experiment, or GRACE, mission flies twin spacecraft in tandem around Earth to study key changes in the planet's waters and ice sheets.

03/17/2002

Earth



Atmospheric Infrared Sounder

The Atmospheric Infrared Sounder, or AIRS, instrument is a key tool for climate studies on greenhouse gases and carbon dioxide distribution, as well as weather forecasts.

05/04/2002

Earth



Galaxy Evolution Explorer

The Galaxy Evolution Explorer, or GALEX, was an orbiting space telescope designed to observe the universe in ultraviolet wavelengths to measure the history of star formation in the universe.

04/28/2003

Universe

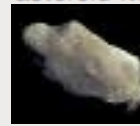


Hayabusa

The first mission to return a sample of material from the surface of a near-Earth object, the Japanese Hayabusa spacecraft, which also carried a mini-lander named MINERVA, was originally designed as a technology demonstration mission.

05/09/2003

asteroid Itokawa



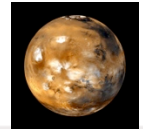


Mars Exploration
Rover - Spirit

One of two rovers launched in 2003 to explore Mars and search for signs of past life, Spirit far outlasted her planned 90-day mission.

06/10/2003

Mars

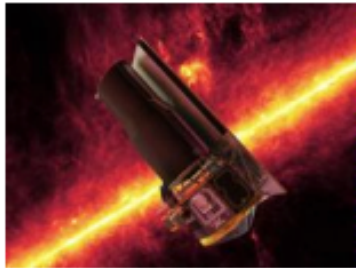
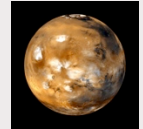


Mars Exploration
Rover -
Opportunity

Opportunity was the second of the two rovers launched in 2003 to land on Mars and begin traversing the Red Planet in search of signs of past life.

07/07/2003

Mars



Spitzer Space
Telescope

Considered a cousin of the Hubble Space Telescope, the Spitzer Space Telescope is designed to study the early universe in infrared light.

08/25/2003

Universe



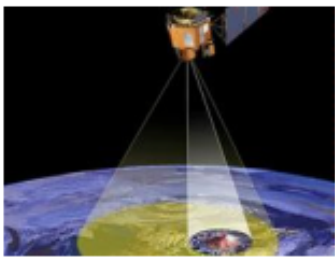
Microwave
Instrument for the
Rosetta Orbiter

Flying aboard the European Space Agency's Rosetta spacecraft, the NASA-built Microwave Instrument for the Rosetta Orbiter, or MIRO, will study gases given off by comet 67P/Churyumov-Gerasimenko when the spacecraft goes into orbit around the object in January 2014.

03/02/2004

comet
67P/Churyumov-
Gerasimenko





Autonomous Sciencecraft Experiment

The Autonomous Sciencecraft Experiment is an experimental technology on the Earth Observer 1 spacecraft that can autonomously make decisions about what data to collect, process that data and send it back to Earth.

06/15/2004

Earth



Microwave Limb Sounder

Making up one piece of the most advanced and accurate atmospheric chemistry laboratory ever deployed in space, the Microwave Limb Sounder, or MLS, instrument flies aboard NASA's Aura Earth satellite with three other instruments.

07/15/2004

Earth



Tropospheric Emission Spectrometer

An infrared sensor instrument aboard NASA's Aura Earth satellite, the Tropospheric Emission Spectrometer, or TES, is designed to measure and investigate Earth's troposphere, the lowest level of Earth's atmosphere, and one of its key chemical components, ozone.

07/15/2004

Earth



Deep Impact

Famous for its July 4, 2005 planned impact with comet Tempel 1 that generated a brilliant flash of light later discovered to be ice and dust debris ejecting from the fresh impact crater, the Deep Impact mission was the first attempt to peer beneath the surface of a comet.

01/12/2005

comet Tempel 1



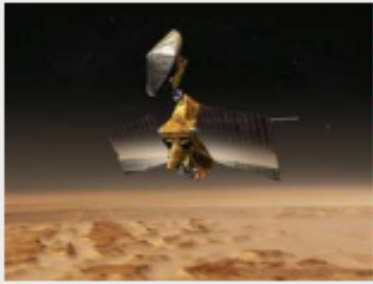
Deep Impact - EPOXI

The EPOXI mission recycled the Deep Impact spacecraft, which had formerly visited comet Tempel 1, to visit a second comet, Hartley 2.

01/12/2005

comet Hartley 2



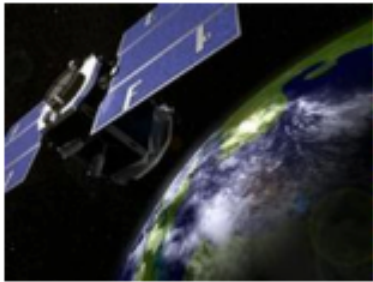
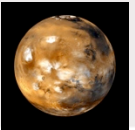


Mars Reconnaissance Orbiter

The Mars Reconnaissance Orbiter, or MRO, has studied the Red Planet's atmosphere and terrain from orbit since 2006 and also serves as a key data relay station for other Mars missions, including the Mars Exploration Rover Opportunity.

08/12/2005

Mars

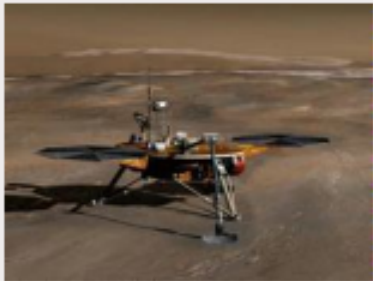


Cloudsat

Part of NASA's fleet of weather- and climate-tracking satellites, CloudSat uses advanced radar to examine the inner structure of clouds, helping researchers better understand how severe tropical cyclones as well as climate changes related to clouds occur.

04/28/2006

Earth

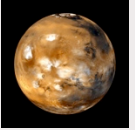


Phoenix

Phoenix was a lander sent to the surface of Mars to search for evidence of past or present microbial life.

08/04/2007

Mars



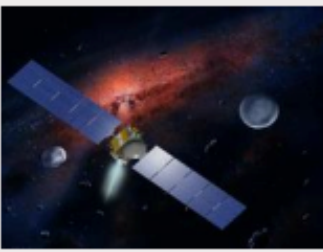
Uninhabited Aerial Vehicle Synthetic Aperture Radar

The Uninhabited Aerial Vehicle Synthetic Aperture Radar, or UAVSAR, is an imaging radar instrument that collects key measurements of Earth deformation.

08/18/2007

Earth





Dawn

Having explored the giant asteroid Vesta and on its way to the dwarf planet Ceres, the Dawn spacecraft is designed to conduct an in-depth and up-close study of these two celestial bodies believed to have formed early in the history of the solar system.

09/27/2007

asteroid Vesta,
Ceres

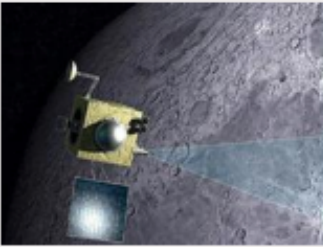


Ocean Surface
Topography
Mission / Jason 2

The Ocean Surface Topography Mission / Jason 2 is an Earth satellite designed to make observations of ocean topography for investigations into sea-level rise and the relationship between ocean circulation and climate change.

06/20/2008

Earth



Moon Mineralogy
Mapper

The Moon Mineralogy Mapper, or M3, instrument flew aboard Chandrayaan-1, India's first mission to the moon, and provided the first mineralogical map of the lunar surface.

10/22/2008

Moon



Orbiting Carbon
Observatory

The Orbiting Carbon Observatory, or OCO, was designed to make space-based observations of carbon dioxide in Earth's atmosphere to better understand the characteristics of climate change.

02/24/2009

Earth

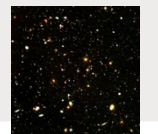


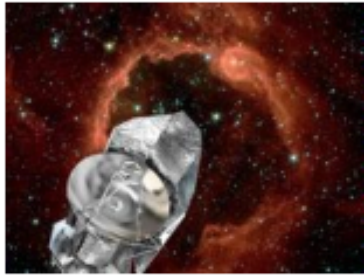
Kepler

Kepler is a space telescope designed to survey a portion of the Milky Way galaxy in search of Earth-size planets, including those where liquid water and possibly life might exist.

03/06/2009

Universe



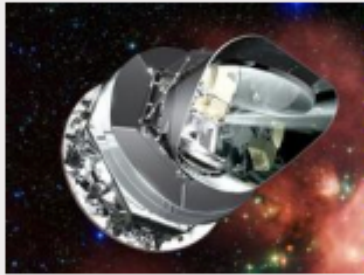


Herschel Space Observatory

A space-based telescope designed to study some of the coldest and darkest regions of the universe using infrared light, Herschel was responsible for numerous findings about dark matter, galaxies and other cosmic mysteries.

05/14/2009

Universe

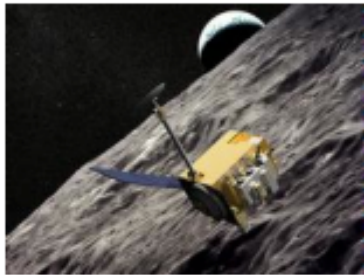
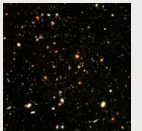


Planck

Designed to study ancient radiation from the big bang, the Planck space telescope was a European Space Agency mission that aimed to better understand the origin of the universe and the formation of galaxies.

05/14/2009

Universe



Diviner Lunar Radiometer Experiment

An instrument flying aboard NASA's Lunar Reconnaissance Orbiter, the Diviner Lunar Radiometer Experiment is designed to measure surface temperatures on the moon, providing key information for future lunar surface operations and exploration.

06/18/2009

Moon

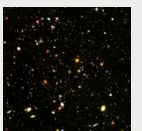


Wide-field Infrared Survey Explorer

An infrared space telescope designed to detect some of the faintest objects in space, the Wide-Field Infrared Survey Explorer, or WISE, discovered 19 comets and more than 33,500 asteroids during its nine-month primary mission alone, snapping more than 1.8 million images.

12/14/2009

Universe



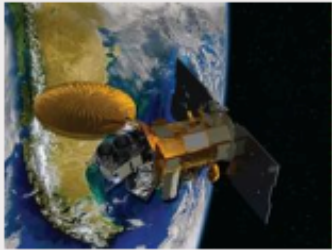


Large Binocular Telescope Interferometer

The Large Binocular Telescope Interferometer, or LBTI, is a ground-based instrument connecting two 8-meter class telescopes on Mount Graham in Arizona to form the largest single-mount telescope in the world.

12/06/2010

Universe



Aquarius

The Aquarius mission is providing the first global observations of sea surface salinity, giving climatologists a better understanding of the ocean's role in Earth's water cycle and weather patterns, as well as global climate change.

06/10/2011

Earth



Juno

The Juno spacecraft, currently making its way to Jupiter, will for the first time peer below Jupiter's dense cover of clouds to answer questions about the gas giant and the origins of our solar system.

08/05/2011

Jupiter



Gravity Recovery and Interior Laboratory

The Gravity Recovery and Interior Laboratory, or GRAIL, mission was designed to create the most accurate gravitational map of the moon to date, which when combined with topographic data, can provide insight into the moon's internal structure, composition and evolution.

09/10/2011

Moon

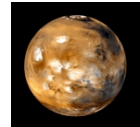


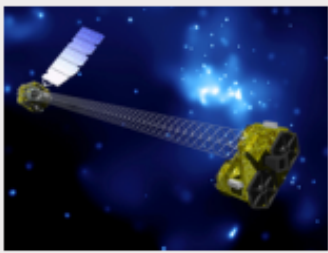
Mars Science Laboratory Curiosity Rover

The Mars Science Laboratory mission's Curiosity rover, the most technologically advanced rover ever built, landed in Mars' Gale Crater the evening of Aug. 5 PDT (morning of Aug. 6 EDT) using a series of complicated landing maneuvers never before attempted.

11/26/2011

Mars



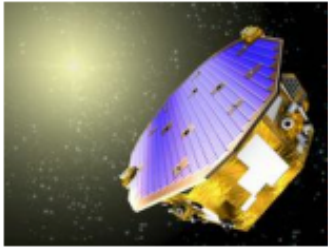


Nuclear Spectroscopic Telescope Array

The Nuclear Spectroscopic Telescope Array, or NuSTAR, mission will study the universe in high energy X-rays to better understand the dynamics of black holes, exploding stars and the most extreme active galaxies.

06/13/2012

Universe

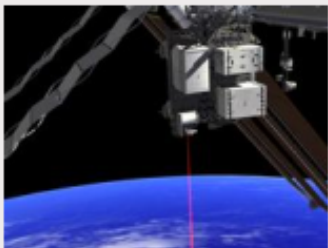
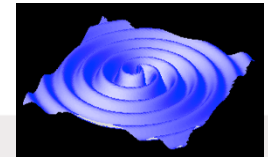


Disturbance Reduction System

The Disturbance Reduction System, or DRS, designed as part of the Space Technology 7 project, is an experimental system for measuring gravitational waves in space, which are thought to contain important data about the history of the universe.

2014

Gravitational waves

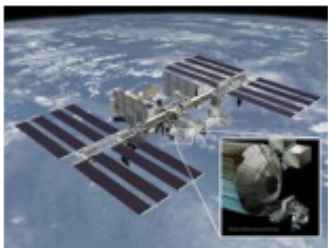


Optical Payload for Lasercomm Science

The Optical Payload for Lasercomm Science, or OPALS, will fly aboard the International Space Station to test out new technologies for spacecraft communication and data transmission.

04/10/2014

Earth

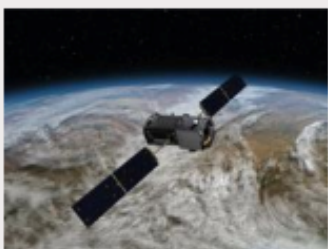


ISS-RapidScat

The ISS-RapidScat instrument is a speedy and cost-effective replacement for NASA's QuikScat Earth satellite, which monitored ocean winds to provide essential measurements used in weather predictions, including hurricane monitoring.

NET August

Earth



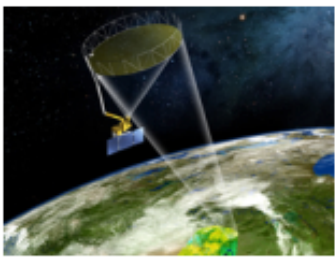
Orbiting Carbon Observatory 2

The Orbiting Carbon Observatory 2, or OCO-2, is a planned Earth satellite mission to study carbon dioxide in the atmosphere and provide scientists with a better idea of the chemical compound's impacts on climate change.

07/01/2014

Earth



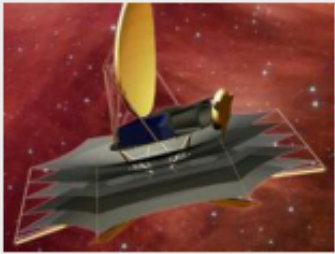


Soil Moisture
Active Passive

Soil Moisture Active Passive, or SMAP, scheduled to launch in November 2014, is an Earth satellite mission to measure and map Earth's soil moisture and freeze/thaw state to better understand terrestrial water, carbon and energy cycles.

11/05/2014

Earth

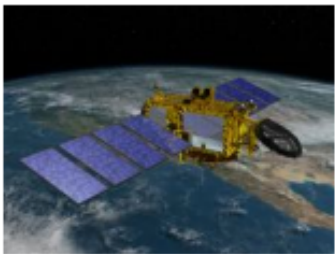
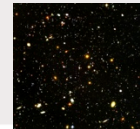


Single Aperture
Far-Infrared
Observatory

The Single Aperture Far-Infrared Observatory, or SAFIR, is a proposed NASA mission to study the earliest evolution of galaxies, stars and planetary systems using a large cryogenic space telescope.

2015

Universe



Jason 3

Extending the timeline of ocean surface topography measurements begun by the Topex/Poseidon and Jason 1 and 2 satellites, Jason 3 will make highly detailed measurements of sea-level on Earth to gain insight into ocean circulation and climate change.

03/2015

Earth



InSight

The InSight mission (formerly called GEMS), would place a lander on Mars that would be designed to drill beneath the surface and investigate the planet's deep interior to better understand Mars' evolution as a rocky planet.

03/2016

Mars



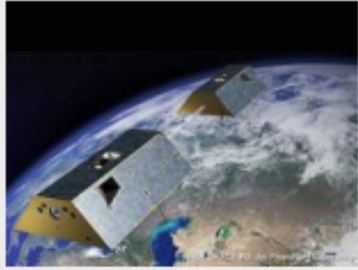
Cold Atom
Laboratory

A facility designed to fly aboard the International Space Station, the Cold Atom Laboratory, or CAL, will make use the space station's unique microgravity environment to observe quantum phenomena that would otherwise be undetectable from Earth.

04/2016

Universe



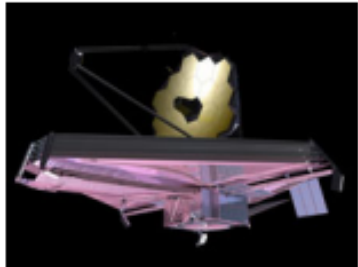


Gravity Recovery and Climate Experiment Follow-On

The Gravity Recovery and Climate Experiment Follow-on (GRACE-FO) mission is a partnership between NASA and the German Research Centre for Geosciences (GFZ).

2017

Earth



Mid-Infrared Instrument

Designed to play a key role in NASA's James Webb Space Telescope, the Mid-Infrared Instrument, or MIRI, will image stars and galaxies in infrared light.

2018

Universe



Deformation, Ecosystem Structure and Dynamics of Ice

A proposed Earth satellite mission with the potential to identify likely earthquakes, volcanos and landslides, the Deformation, Ecosystem Structure and Dynamics of Ice, or DESDynI, mission will use specialized sensors to study land surface and climate changes.

2019

Earth

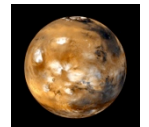


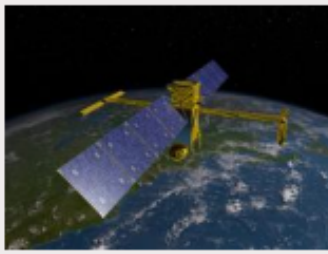
Mars Sample Return

Mars Sample Return is a proposed mission to return samples from the surface of Mars to Earth.

To be determined

Mars



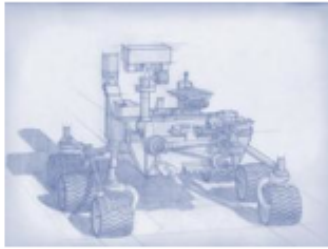


Surface Water and Ocean Topography

Designed to make the first-ever global survey of Earth's surface water, the Surface Water and Ocean Topography, or SWOT, satellite will collect detailed measurements of how water bodies on Earth change over time.

2020

Earth

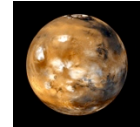


Mars 2020

The Mars 2020 mission is a future rover designed to investigate key questions about the habitability of Mars, and assess natural resources and hazards in preparation for future human expeditions to the Red Planet.

2020

Mars

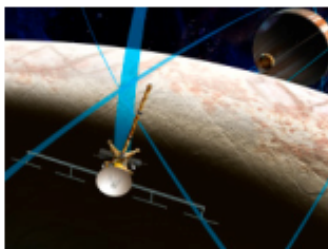


Orbiting Carbon Observatory 3

The Orbiting Carbon Observatory 3, or OCO-3, is a future space instrument designed to investigate important questions about the distribution of carbon dioxide on Earth as it relates to growing urban populations and changing patterns of fossil fuel combustion.

To be determined

Earth

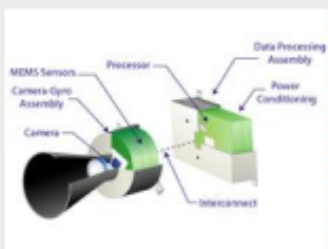
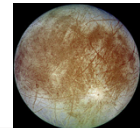


Europa Clipper

The Europa Clipper is a concept under study by NASA that would conduct detailed reconnaissance of Jupiter's moon Europa and would investigate whether the icy moon could harbor conditions suitable for life.

To be determined

Europa



Inertial Stellar Compass

A brainchild of the Space Technology 6 project, the Inertial Stellar Compass is a conceptual advanced navigation system designed to allow spacecraft of the future to operate more autonomously.

To be determined

To be determined

