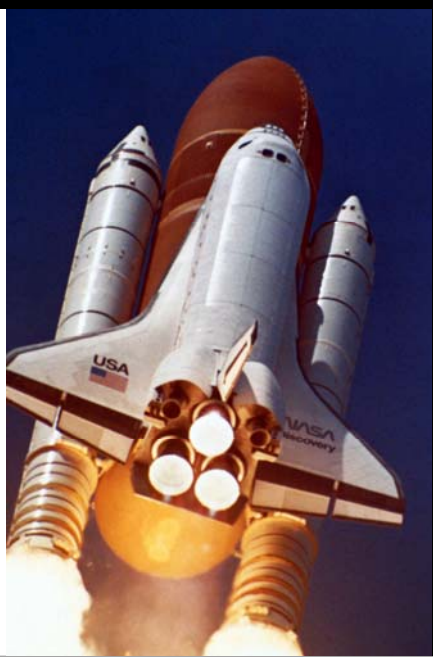
# NASA MISSION DIRECTORATES




NASA's mission is to pioneer future space exploration, scientific discovery, and aeronautics research.

On January 14, 2004, President George W. Bush announced *A Renewed Spirit of Discovery*: The President's Vision for U.S. Space Exploration, a new directive for the nation's space program. The fundamental goal of this directive is "to advance U.S. scientific, security, and economic interests through a robust space exploration program." In issuing it, the President committed the nation to a journey of exploring the solar system and beyond. The journey will begin with returning to the Moon in the next decade, and then venturing further into the solar system, ultimately sending humans to Mars and beyond. He challenged NASA to establish new and innovative programs to enhance understanding of the planets; to ask new questions; and to answer questions that are as old as humankind.

To meet the President's challenge, thousands of people have been working around the world -- and off of it -- for almost 50 years, trying to answer some basic questions.

***What's out there in space?***

***How do we get there?***

***What will we find?***

***What can we learn there?***

***What will we learn just by trying to get there?***

***What will we learn that will make life better here on Earth?***

# NASA'S STRATEGIC GOALS

NASA has six strategic goals:

- Fly the Shuttle as safely as possible until its retirement, not later than 2010.
- Complete the International Space Station in a manner consistent with NASA's International Partner commitments and the needs of human exploration.
- Develop a balanced overall program of science, exploration, and aeronautics consistent with the redirection of the human spaceflight program to focus on exploration.
- Bring a new Crew Exploration Vehicle into service as soon as possible after Shuttle retirement.
- Encourage the pursuit of appropriate partnerships with the emerging commercial space sector.
- Establish a lunar return program having the maximum possible utility for later missions to Mars and other destinations.


## A Little History

President Dwight D. Eisenhower established the National Aeronautics and Space Administration in 1958, partially in response to the Soviet Union's launch of the first artificial satellite the previous year. NASA grew out of the National Advisory Committee on Aeronautics (NACA), which had been researching flight technology for more than 40 years.

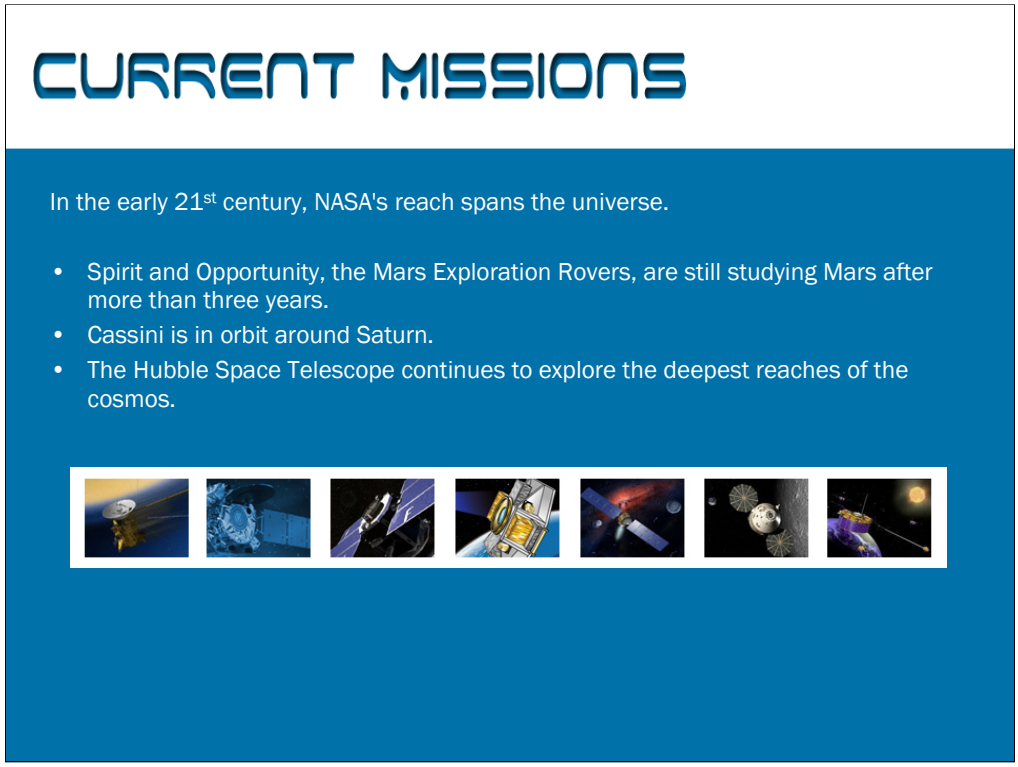
President John F. Kennedy focused NASA and the nation on sending astronauts to the Moon by the end of the 1960s. Through the Mercury and Gemini projects, NASA developed the technology and skills it needed for the journey. On July 20, 1969, Neil Armstrong and Buzz Aldrin became the first of 12 men to walk on the Moon, meeting Kennedy's challenge.


Meanwhile, NASA was continuing the aeronautics research pioneered by NACA. It also conducted purely scientific research and worked on developing applications for space technology, combining both pursuits in developing the first weather and communications satellites.

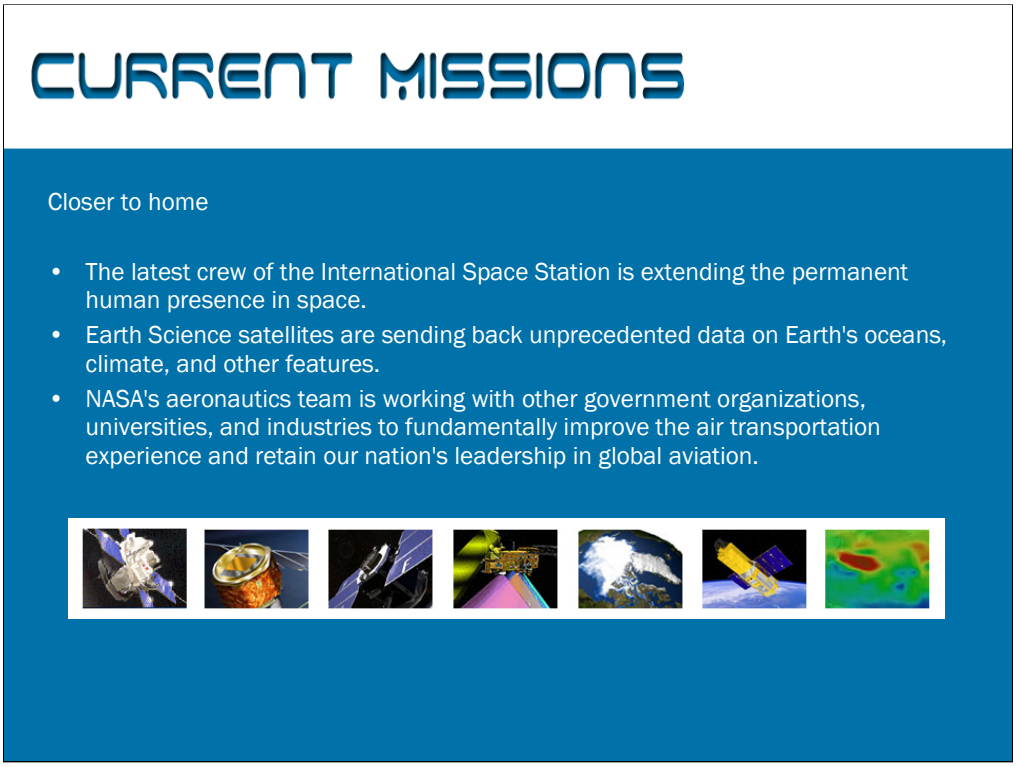
After Apollo, NASA focused on creating a reusable ship to provide regular access to space: the Space Shuttle. First launched in 1981, the space shuttle has had 120 successful flights. In 2000 The United States and Russia established permanent human presence in space aboard the International Space Station, a multinational project representing the work of 16 nations.


NASA also has continued its scientific research. In 1997, Mars Pathfinder became the first in a fleet of spacecraft that will explore Mars in the next decade, ever existed there. The Terra and Aqua satellites are flagships of a different fleet, this one in Earth orbit, designed to help us understand how our world is changing. NASA's aeronautics teams are focused on improved aircraft travel that is safer and cleaner.

Throughout its history, NASA has conducted or funded research that has led to numerous improvements to life Earth..




There are many current missions being conducted by NASA each year. You can see mission highlights and photos on the **NASA Mission's** Web site, http://www.nasa.gov/missions/current/index.html. On this site, you will be able to search through all NASA missions (past, present, and future) along with the launch schedules and calendar for current missions. Below are a few current missions.




Closer to home, the latest crew of the International Space Station is extending the permanent human presence in space. Earth Science satellites are sending back unprecedented data on Earth's oceans, climate, and other features. NASA's aeronautics team is working with other government organizations, universities, and to fundamentally improve the air transportation experience and retain our nation's leadership in global aviation.


In the next 20 years, NASA will be laying the groundwork for sending humans not only beyond Earth's orbit, but further into to space than they've ever been. These are the next key steps:

Complete the International Space Station and retire the Space Shuttle by 2010

Begin robotic missions to the Moon by 2008 and return people there by 2020

Continue robotic exploration of Mars and the Solar System

Develop a crew exploration vehicle and other technologies required to send people beyond low Earth orbit

# NASA LEADERSHIP

NASA Headquarters, in Washington, D.C., provides overall guidance and direction to the agency, under the leadership of the NASA Administrator.

Michael Griffin

Shana Dale

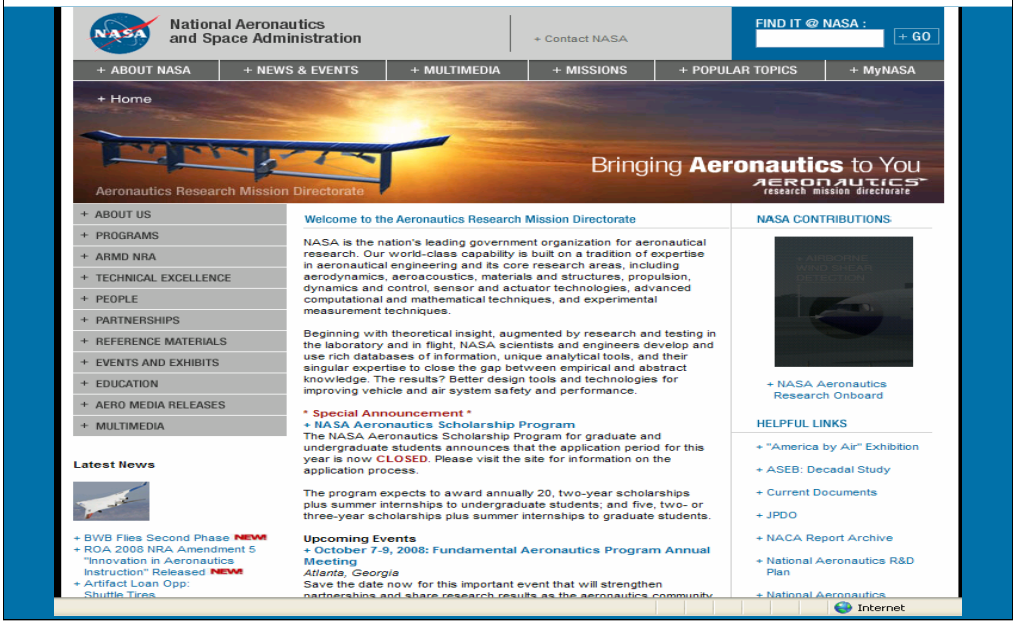
NASA Headquarters, in Washington D.C., provides overall guidance and direction to the agency, under the leadership of Administrator Michael Griffin. Ten field centers and a variety of installations conduct the day-to-day work in laboratories, on air fields, in wind tunnels, and in control rooms.

# NASA'S ORGANIZATION


To implement NASA's Mission, NASA Headquarters is organized into four Mission Directorates.

- Aeronautics
- Exploration Systems
- Science
- Space Operations

# 1. AERONAUTICS



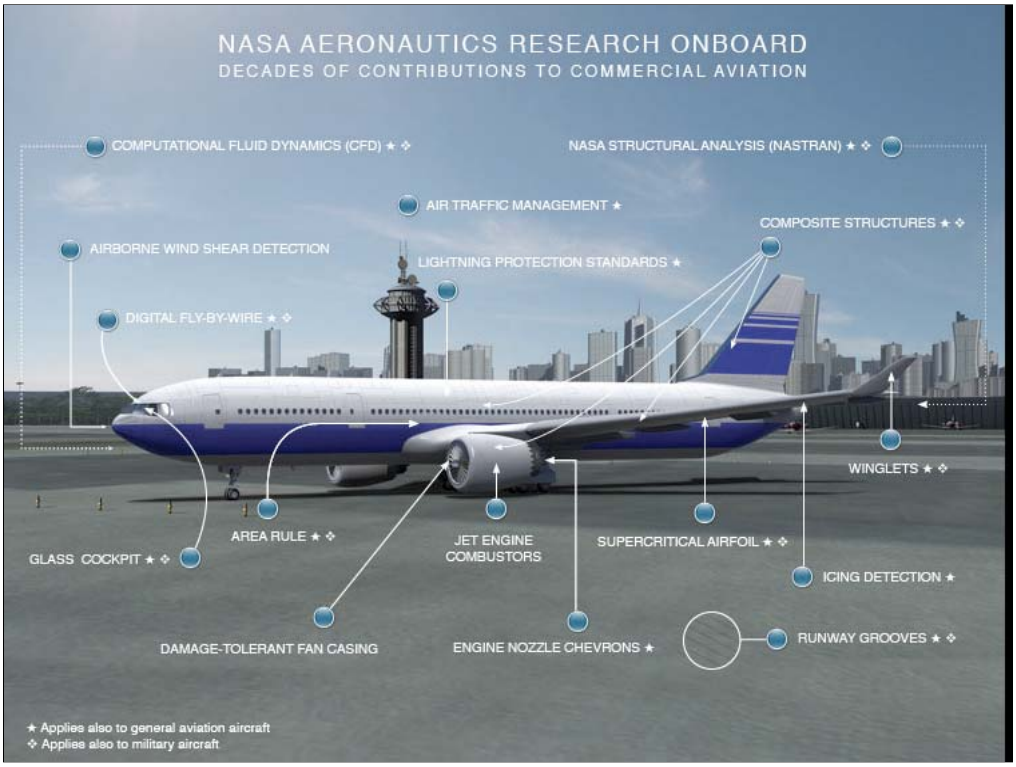

Aeronautics: pioneers and proves new flight technologies that improve our ability to explore and which have practical applications on Earth.

# 1. AERONAUTICS (ARMD)

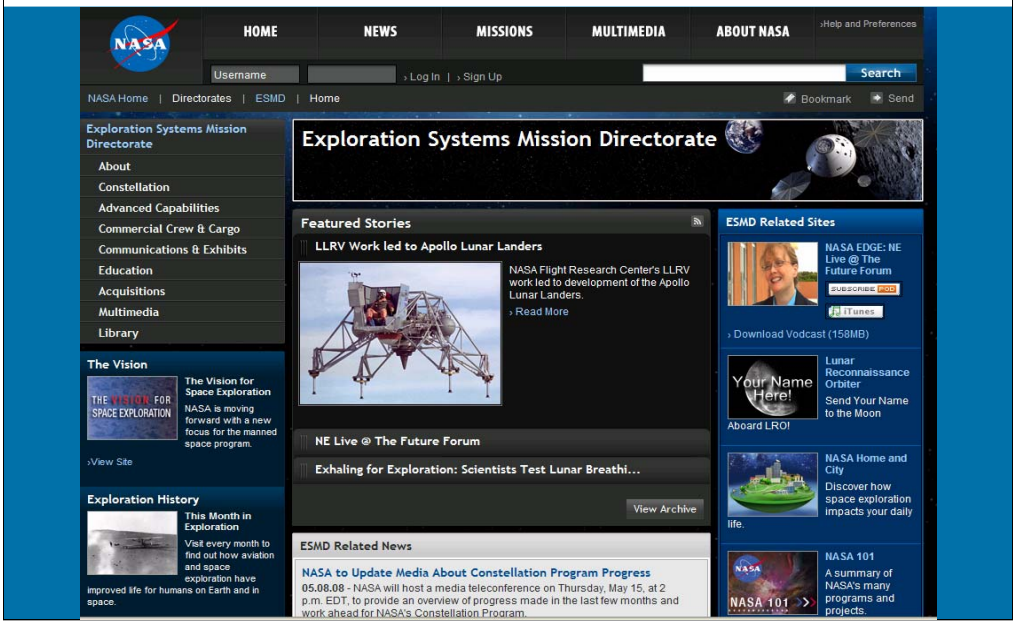
**Aeronautics Research Mission Directorate (ARMD)** generates the revolutionary concepts, technologies, and capabilities needed to advance aircraft and airspace systems.

ARMDs programs facilitate safer, more efficient and environmentally friendly air transportation systems.

In addition ARMDs research will continue to play a vital role in supporting NASA's human and robotic space activities.


NASA AERONAUTICS RESEARCH ONBOARD
DECADES OF CONTRIBUTIONS TO COMMERCIAL AVIATION
COMPUTATIONAL FLUID DYNAMICS (CFD) ★ ❖
NASA STRUCTURAL ANALYSIS (NASTRAN) ★ ❖
AIR TRAFFIC MANAGEMENT ★
COMPOSITE STRUCTURES ★ ❖
AIRBORNE WIND SHEAR DETECTION
LIGHTNING PROTECTION STANDARDS ★
DIGITAL FLY-BY-WIRE ★ ❖
WINGLETS ★ ❖
AREA RULE ★ ❖
GLASS COCKPIT ★ ❖
JET ENGINE COMBUSTORS
SUPERCRITICAL AIRFOIL ★ ❖
ICING DETECTION ★
DAMAGE-TOLERANT FAN CASING
ENGINE NOZZLE CHEVRONS ★
RUNWAY GROOVES ★ ❖
★ Applies also to general aviation aircraft
❖ Applies also to military aircraft

# 2. EXPLORATION SYSTEMS



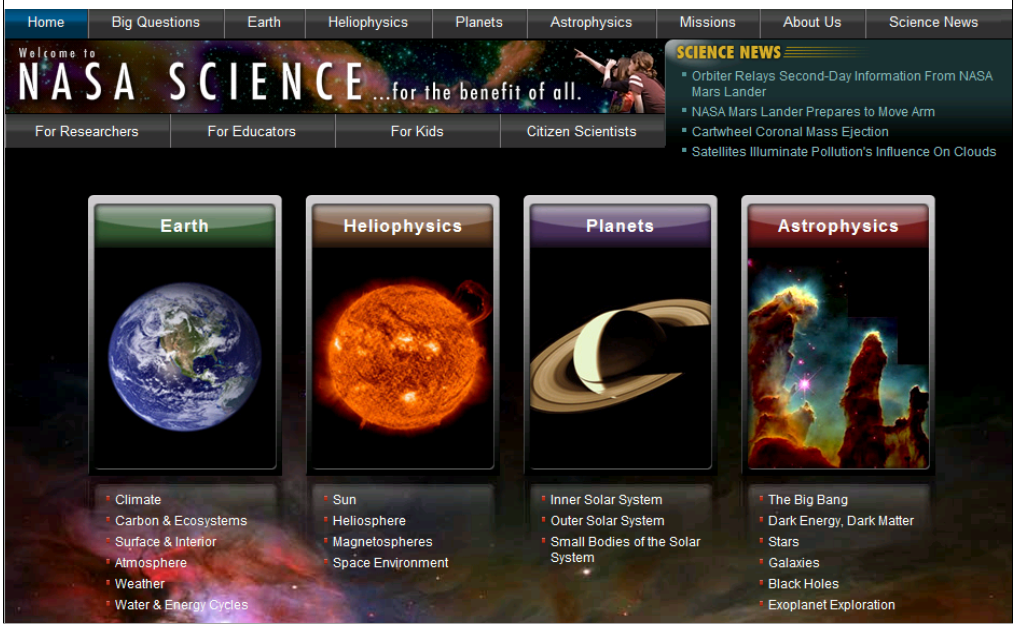

Exploration Systems: creates new capabilities and spacecraft for affordable, sustainable human and robotic exploration.

# 2. EXPLORATION SYSTEMS (ESMD)

**Exploration Systems Mission Directorate (ESMD)** develops the launch systems, vehicles, and other capabilities that will carry humans into space and ultimately enable exploration on the Moon and Mars, beginning with the servicing of the International Space Station and following the retirement of the Space Shuttle in 2010.

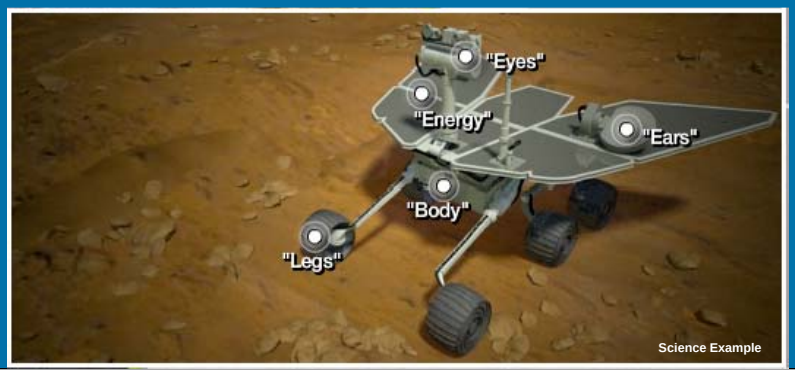

The Orion crew exploration vehicle and its service module orbit the Moon with disc-shaped solar arrays tracking the sun.

# 3. SCIENCE


Home
Big Questions
Earth
Heliophysics
Planets
Astrophysics
Missions
About Us
Science News
Welcome to
NASA SCIENCE ...for the benefit of all.
For Researchers
For Educators
For Kids
Citizen Scientists
SCIENCE NEWS
Orbiter Relays Second-Day Information From NASA Mars Lander
NASA Mars Lander Prepares to Move Arm
Cartwheel Coronal Mass Ejection
Satellites Illuminate Pollution's Influence On Clouds
Earth
Climate
Carbon & Ecosystems
Surface & Interior
Atmosphere
Weather
Water & Energy Cycles
Heliophysics
Sun
Heliosphere
Magnetospheres
Space Environment
Planets
Inner Solar System
Outer Solar System
Small Bodies of the Solar System
Astrophysics
The Big Bang
Dark Energy, Dark Matter
Stars
Galaxies
Black Holes
Exoplanet Exploration

# 3. SCIENCE (SMD)

**Science Mission Directorate (SMD)** projects humankind's vantage point into space with Earth-orbit and deep space observatories; spacecraft that visit other planetary bodies; and robotic landers, rovers, and sample return missions. SMD develops and deploys satellites and strives around the world to answer fundamental questions requiring the view from and into space.

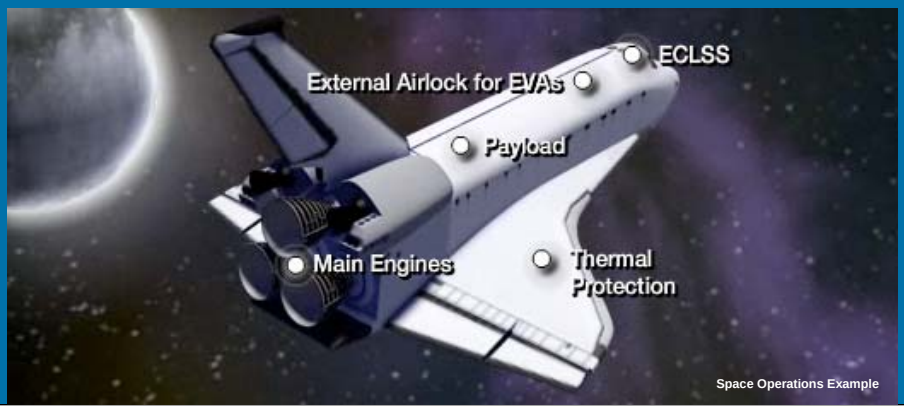



The Science Mission Directorate develops and deploys satellites and probes in collaboration with NASA's partners around the world to answer fundamental questions requiring the view from and into space. The rover is an example.

# 4. SPACE OPERATIONS

# 4. SPACE OPERATIONS (SOMD)

**Space Operations Mission Directorate (SOMD)** manages the Space Shuttle and International Space Station (ISS) programs, as well as space communications and launch services. The SOMD paves the way for extended-duration human exploration in space.




The SOMD manages the Space Shuttle and the International Space Station programs, as well as  space communications and launch services.

# DAY 2

Yesterday, we learned about NASA's Mission Directorates. Today, we're going to begin our challenge.

The class will be divided into four groups, one for each Directorate.

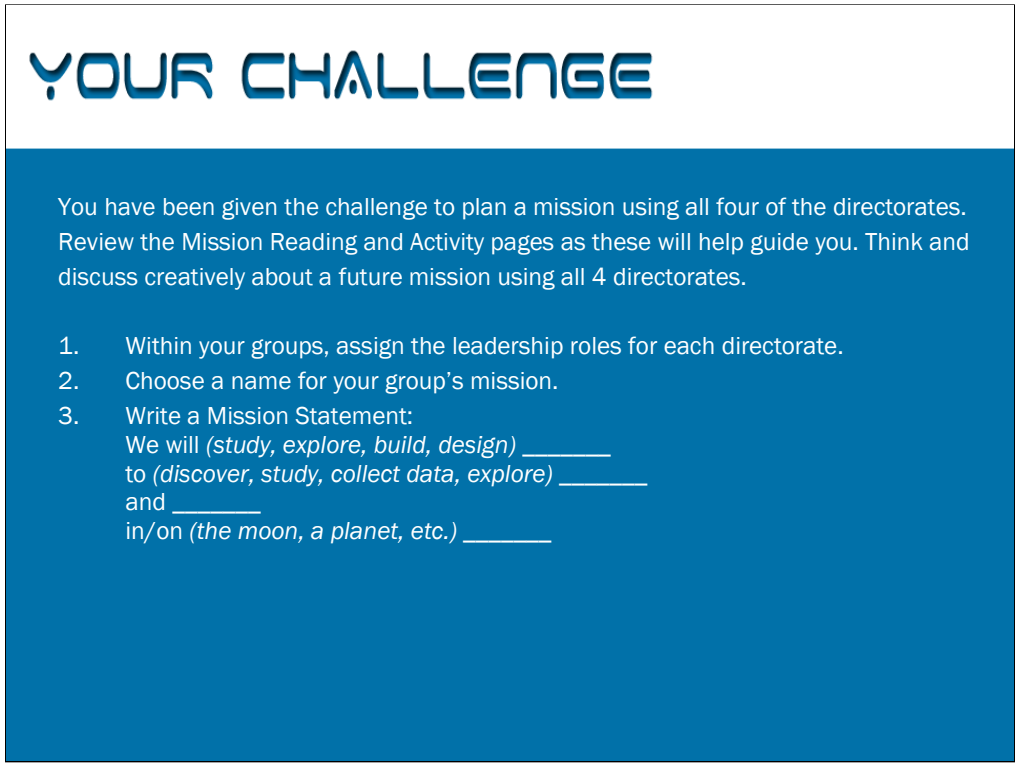
# NASA'S ORGANIZATION

A directorate is an agency usually headed by a director, and is often a subdivision of a major government department.

To implement NASA's Mission, NASA Headquarters is organized into four Mission Directorates.

1. Aeronautics: Pioneers and proves new flight technologies that improve our ability to explore and which have practical applications on Earth.
2. Exploration Systems: Creates new capabilities and spacecraft for affordable, sustainable human and robotic exploration
3. Science: Explores the Earth, moon, Mars, and beyond; charts the best route of discovery; and reaps the benefits of Earth and space exploration for society.
4. Space Operations: Provides critical enabling technologies for much of the rest of NASA through the space shuttle, the International Space Station, and flight support.

**Remember, NASA Headquarters is organized into four Mission Directorates.**




Your challenge begins!

Your group will write a Mission Statement that outlines your Mission.