National Aeronautics and Space Administration

Marshall Space Flight Center

Powering the Future of Science and Exploration







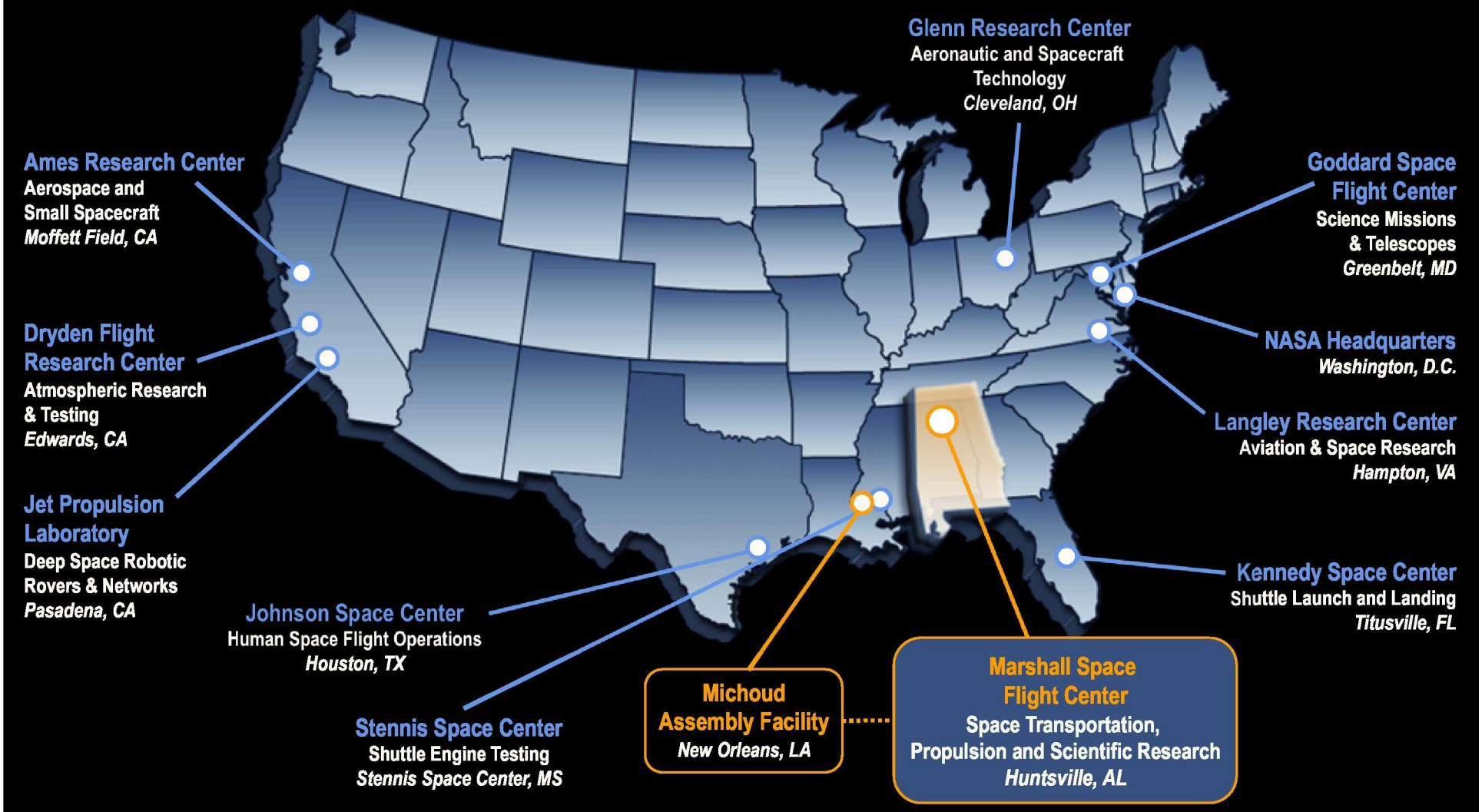
marshall

Steven C. Miley, Associate Director for Operations
Engineering Directorate
August 6, 2009

www.nasa.gov

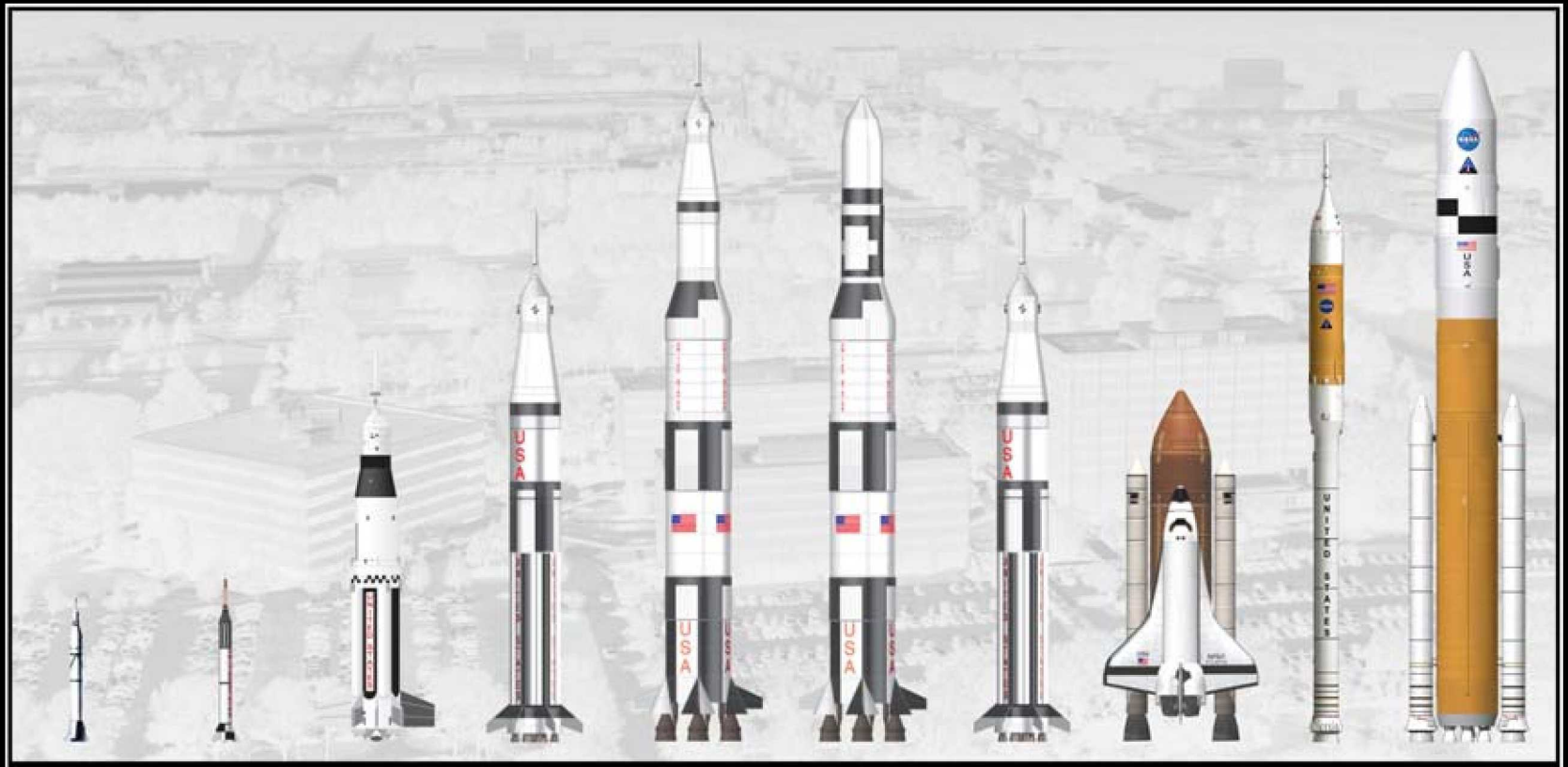
NASA's Strategic Goals

NASA Around the Country



Marshall Is a Space Transportation and Science Center

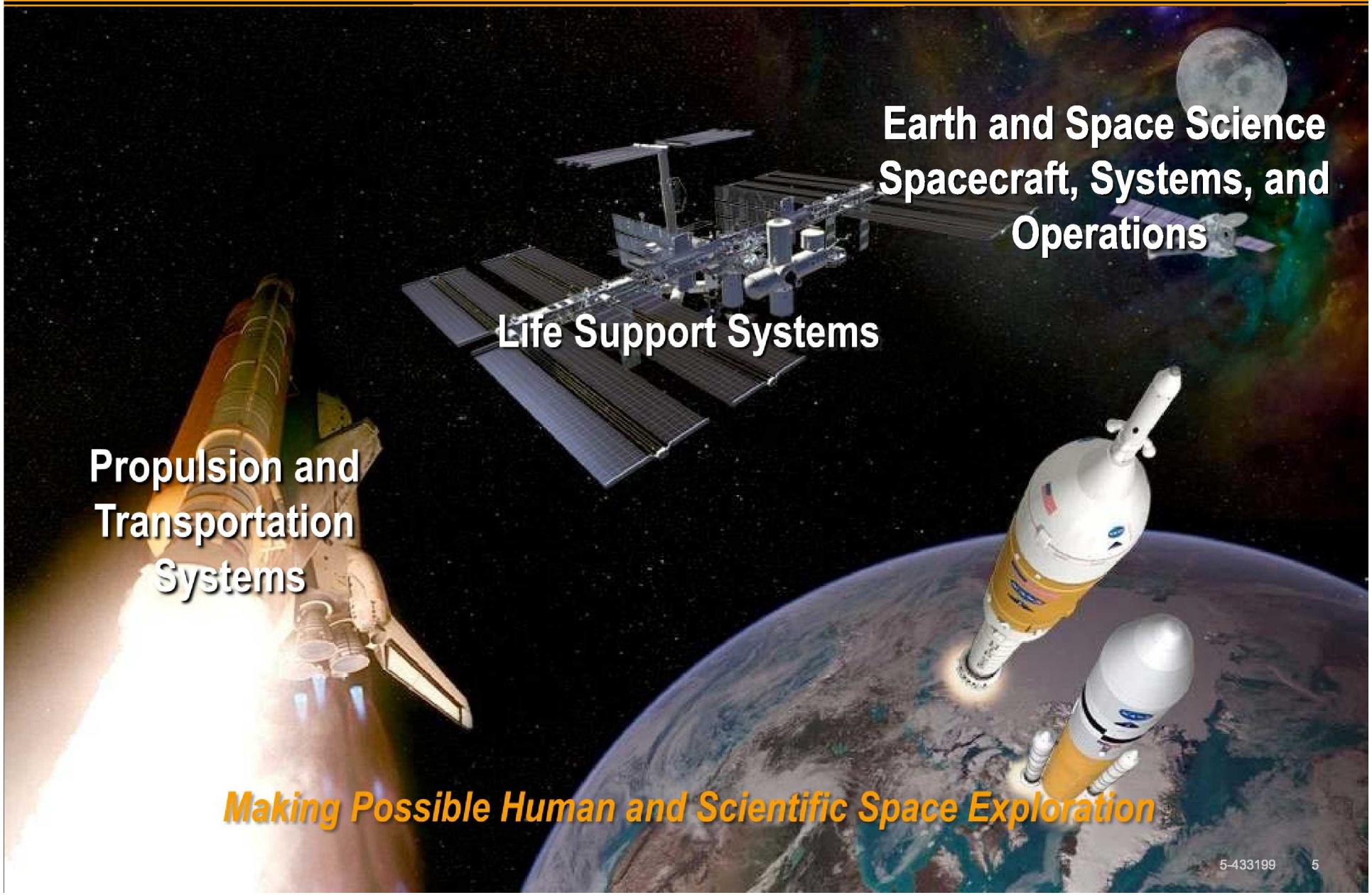
Marshall's History



Jupiter C	Mercury-Redstone	Saturn I	Apollo-Saturn IB	Apollo-Saturn V	Skylab-Saturn V	Saturn IB Apollo-Soyuz	Space Shuttle	Ares I	Ares V
1958	1961	1961-1965	1966-1968	1967-1972	1973	1975	1981-Present	2015 (Planned)	2020 (Planned)

Delivering Space Transportation Solutions for 50 Years

Marshall's Missions



Marshall Statistics: From Exploration to Opportunity

$2.6 billion
budget in fiscal year 2008

6th largest
employer in the Huntsville - Madison county area

> 7,600
employees at Marshall
(2,634 civil service employees in fiscal year 2008)

4.5 million
square feet of space in Huntsville

$1 billion
impact to Alabama economy

2.2 million
square feet of manufacturing space at Michoud Assembly Facility in New Orleans

Providing an Economic Engine based on Science and Technology

Propulsion and Transportation Systems

Shuttle Propulsion Sustaining Engineering

Main engines, external tank, solid rocket boosters

Transitioning to Ares/Orion for missions beyond Earth orbit

Best of Saturn and Shuttle technology used to develop future vehicles

Ares Design and Development

Successor to Shuttle for routine space access

Part of NASA's Constellation Program

First test flight is scheduled for 2009

Building and Sustaining Rockets, from Saturn to Shuttle to Ares

Life Support Systems

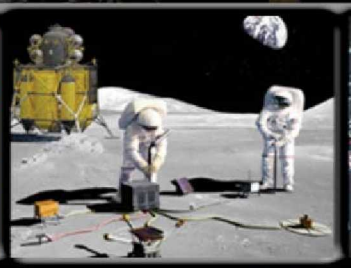
Current Work

- Producing clean air and recycling water
- Providing around-the-clock science operations support
- Making science experimentation possible in space

Future Work

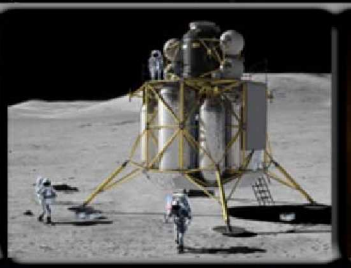
- Exploration life support systems
- Radiation hardened electronics
- Altair Lunar Lander systems
- Lunar resources utilization

Payload Operations Center



Lunar Resources

Environmental Control & Life Support



Altair Lunar Lander

Working in Space

Pioneering Technologies for Living and Working on the New Frontier

Earth Science

Environmental Monitoring

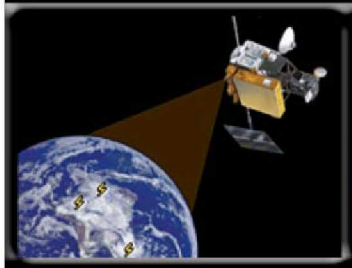
- Understanding climate change and weather patterns

Weather Prediction

- Improving forecasts and weather warning times

Hurricane Research

- Predicting the intensity and dynamics of storms

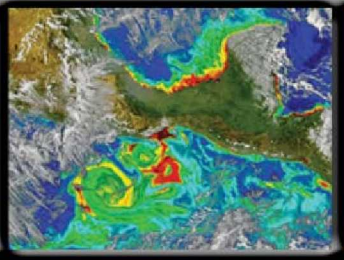


Global Hydrology & Climate Center

HIRAD

SPoRT

Environmental Monitoring



SERVIR

Understanding Our Planet to Improve Safety and Save Lives

Space Science

Preparing for human return to the Moon

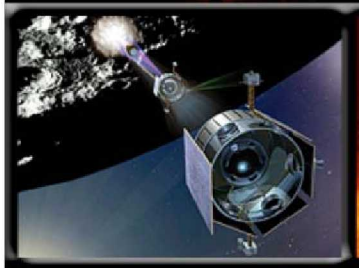
- Robotic missions to search for water ice and gather data
- Program office at Marshall

Learning about our solar system

- Spacecraft to analyze the inner workings of the sun, planets, comets and asteroids
- Program management and instrument development

Learning about our universe

- Scientific instruments to reveal information about activity in deep space
- Management, design and construction



LCROSS

HINODE

Discovery/
New Frontiers

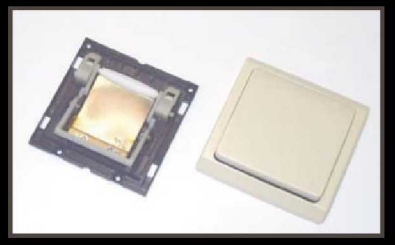
Chandra

JWST/
Marshall XRCF

Gaining Knowledge about the Moon, Solar System, and Universe

NASA Innovation Creates New Jobs, Markets, and Technologies

- **Personal Health**
  - Eye tracker for LASIK surgery
  - Breast biopsy system
- **Consumer Products**
  - Wireless light switch
  - Remote appliance programmer
  - Global Positioning Systems (GPSs)
- **Environmental**
  - Water Filtration system
  - Environmentally friendly
  - Chemical cleanup
- **Security**
  - Stair-climbing tactical robot
  - Crime scene video enhancement



For more information see http://technology.jsc.nasa.gov

Every Dollar Invested in Space is Spent on Earth

NASA Inspires Future Generations of Explorers

- **The Great Moonbuggy Race**
  - 75 student teams from around the world
  - More than 500 high school, college, and university students
  - Designed and raced their rovers on a simulated Moon-scape
- **NASA Student Launch Initiative**
  - 450 middle and high school students participated in 2009
  - Built and flew reusable rockets to 1-mile high with a science payload
- **Students need motivating goals and teachers with information to share**
- **NASA continues to develop educational tools and experiences that inspire, educate, and motivate**
- **Space exploration offers new economic opportunities through technology and resource development**

Learning through Teamwork

Why Explore?

International Collaboration

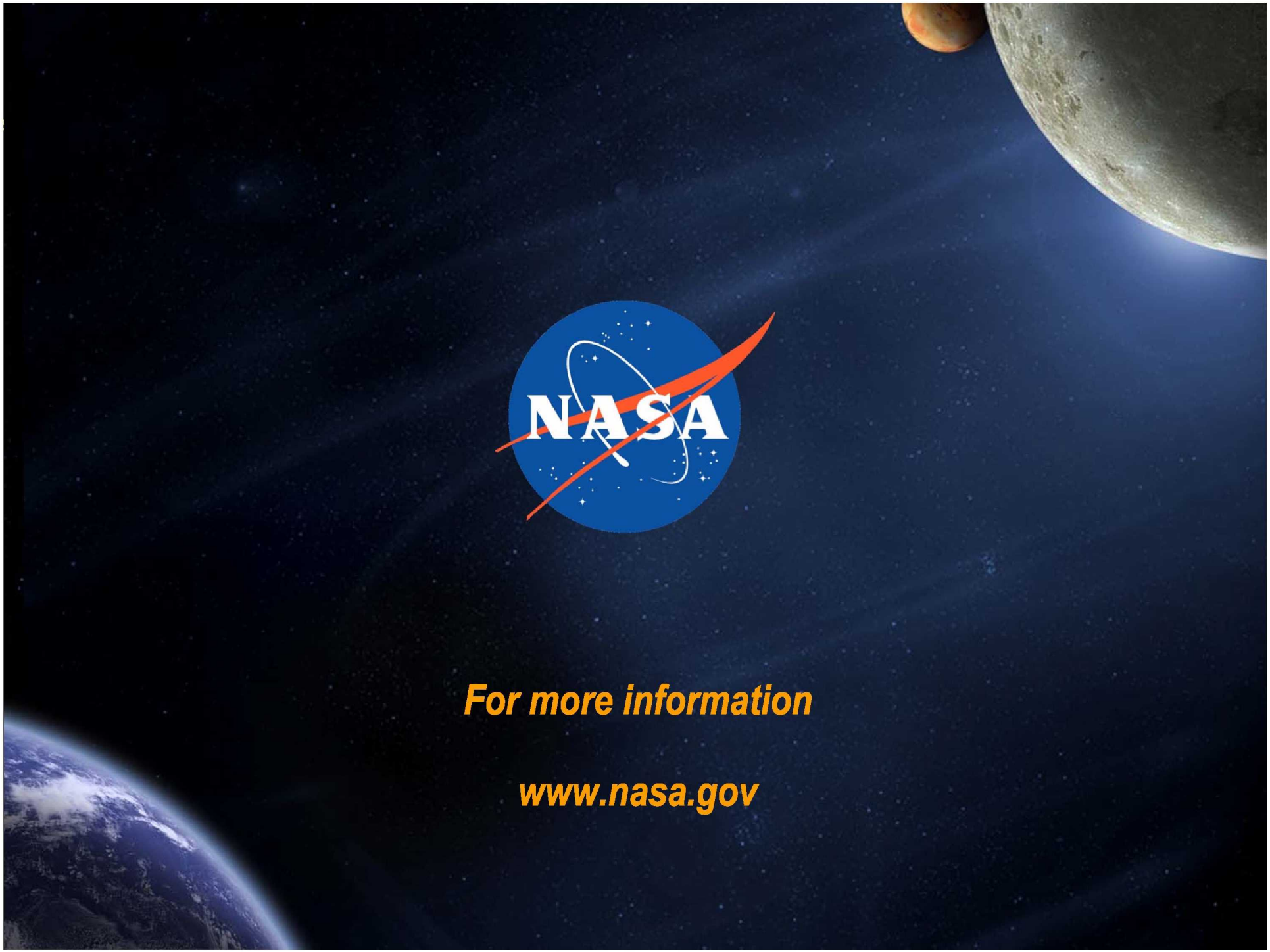
Technological advancement

Scientific discovery

Economic opportunity

National security

Bringing the Benefits of Space Exploration down to Earth


NASA
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