National Aeronautics and Space Administration

Marshall Space Flight Center

Marshall Overview







marshall

Dr. Daniel Schumacher
Director, Science and Technology Office

NASA Around the Country

Glenn Research Center
Aeronautics and Spacecraft Technology
Cleveland, Ohio

Ames Research Center
Aerospace and Small Spacecraft
Moffett Field, Calif.

Goddard Space Flight Center
Science Missions and Telescopes
Greenbelt, Md.

Dryden Flight Research Center
Atmospheric Research and Testing
Edwards, Calif.

NASA Headquarters
Washington, D.C.

Langley Research Center
Aviation and Space Research
Hampton, Va.

Jet Propulsion Laboratory
Deep Space Robotic Rovers and Networks
Pasadena, Calif.

Kennedy Space Center
Space Vehicle Launch and Landing
Cape Canaveral, Fla.

Johnson Space Center
Human Space Flight Operations
Houston, Texas

Michoud Assembly Facility
Large Vehicle Manufacturing
New Orleans, La.

Marshall Space Flight Center
Space Transportation, Propulsion Systems, Space Systems, and Science
Huntsville, Ala.

Stennis Space Center
Vehicle Engine Testing
Bay St. Louis, Miss.

Supporting NASA's mission with unique engineering expertise.

Marshall Profile

$2B expenditures nationally
($1.2B in Alabama)

6,000 employees
(FY13: 2,446 civil service)

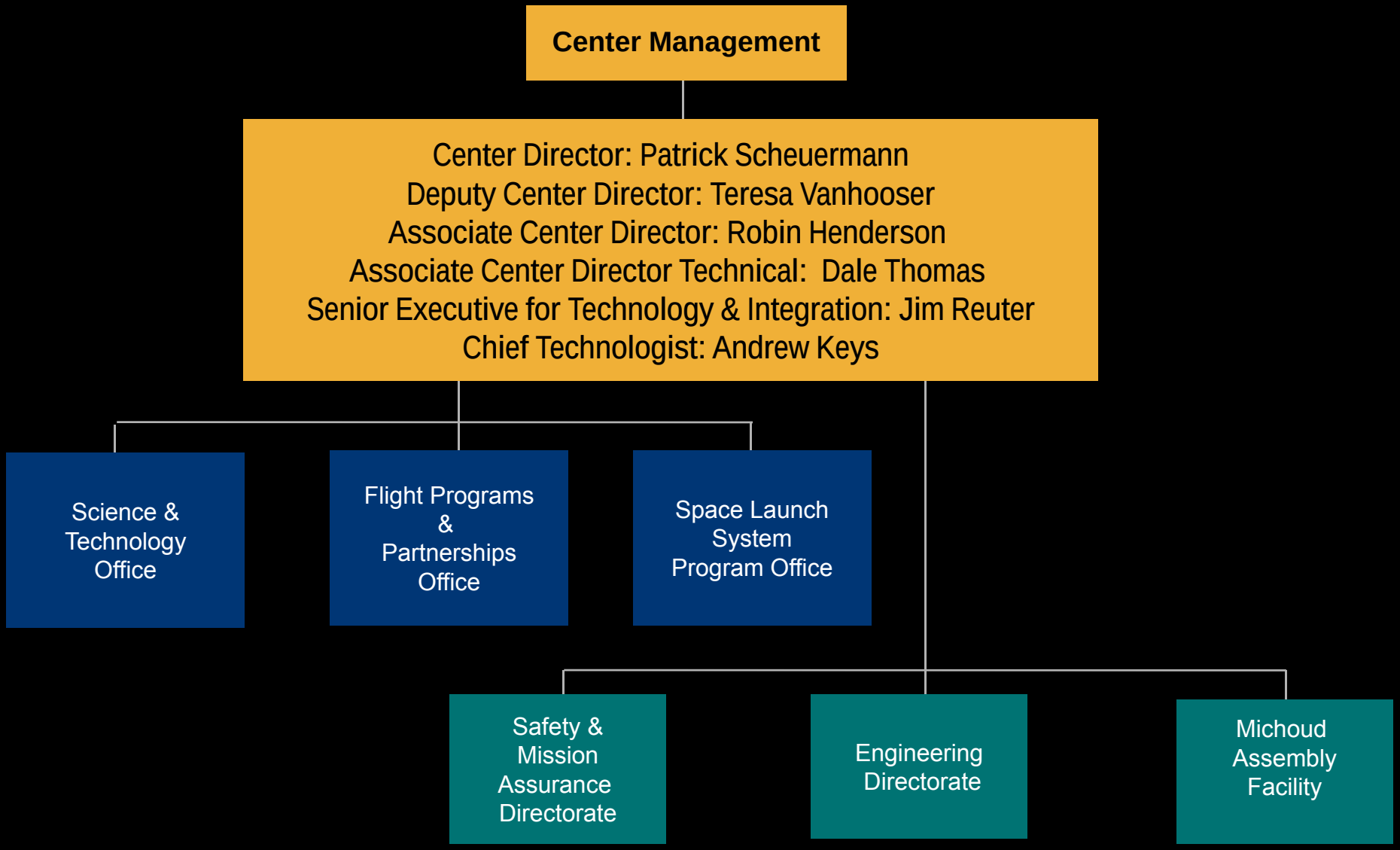
3rd largest employer
in the Huntsville – Madison County area

4 core product lines
supported by more than 125 unique and specialized facilities

Part of an Aerospace/Defense/Commercial Technical Community

- Redstone Arsenal – home to 18 primary Federal organizations
- Cummings Research Park – 2nd largest in U.S. and 4th largest in the world
- Huntsville's concentration of high-tech workers is 2nd in the nation

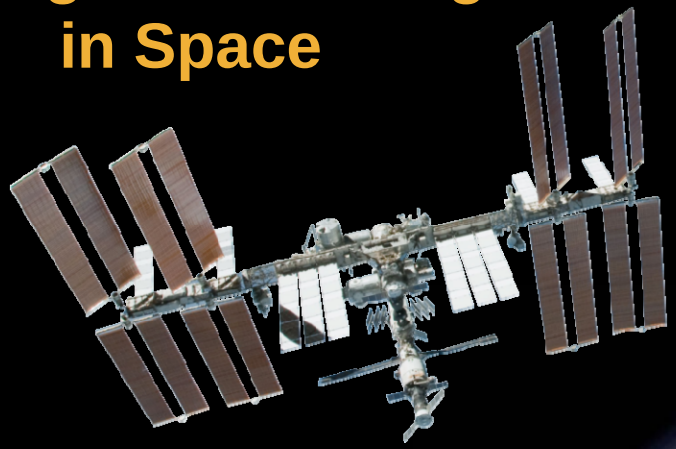
Marshall Organization



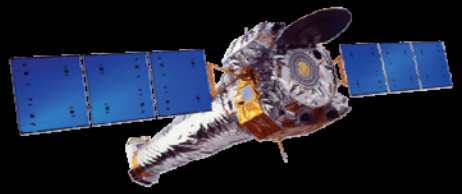
Marshall Mission Areas

Traveling To and Through Space

Living and Working in Space



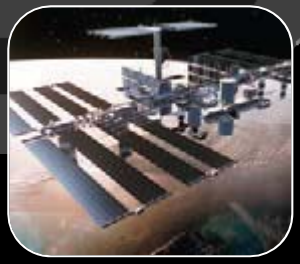
Understanding Our World and Beyond



Marshall's Core Capabilities and Services

Space Transportation & Launch Systems

Propulsion Systems



Space Systems

Scientific Research

Marshall's Portfolio Across Mission Areas

Traveling To and Through Space

Transportation & Propulsion Systems

Exploration Vehicle Development

Space Launch System
- Program Management
- Stages
- Avionics
- Spacecraft & Payload Integration
- Advanced Development
- Boosters
- Engines

Orion
- Launch Abort System Motor Support

Technology Advancement

Advanced Exploration
- Nuclear Cryogenic Propulsion Stage
- Liquid Propulsion Systems

Space Technology
- Composite Cryogenic Propellant Tank
- Cryogenic Propellant Transfer/Storage

Industry & Defense Partnerships

Defense
- NIRPS
- SWORDS

Industry
- COTS Program & Partnerships
- CCDEV Program & Partnerships

NIRPS
National Institute for Rocket Propulsion Systems

Living & Working In Space

Space Systems

Low-Earth Orbit

International Space Station
- *Payload Ops Integration Center*
- Payload Ops Integration Function
- Multi-use Payloads
- Materials Science Research Rack
- Microgravity Science Glovebox
- Environmental Control/Life Support
- ISERV
- 3D Print
- Advanced Manufacturing

Future Exploration

Life Support
- Atmosphere Resource Recovery
- Next-generation Life Support

Destination Systems
- Mighty Eagle
- Lunar Mapping & Modeling
- Nuclear Systems

Technology Demo
- Technology Demonstration Missions
- Centennial Challenges

Understanding Our World & Beyond

Solar System Universe

Astrophysics

Programs
- Chandra

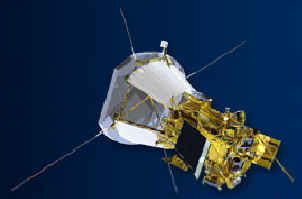
Instruments
- HOPE/HEROES
- Fermi/GBM
- SRG/ART-XC (with Russia)

Research/Technology
- Advance Mirror Technology Demo

Test
- James Webb Mirror & COCOA Test

Heliophysics

Instruments
- Hinode/XRT
- Solar Probe Plus/SWEAP
- SUMI. Hi-C Suborbital



Earth Science

Instruments
- ISERV
- HIRAD
- LIS
- AMPR
- MAPIR

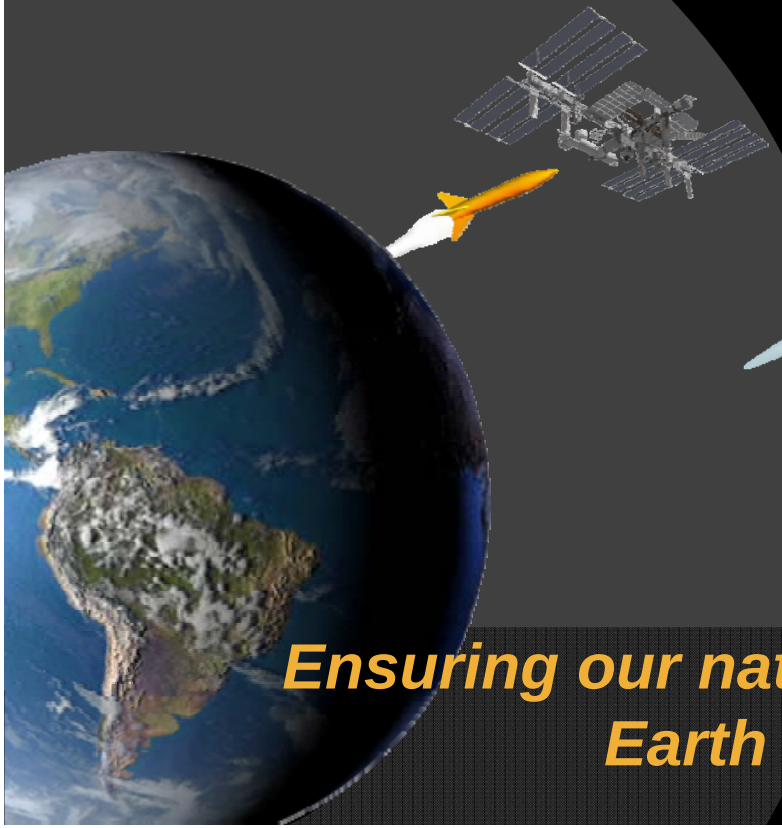
Selected Projects
- SPoRT
- SERVIR
- ACE
- Public Health

Planetary Science

Programs
- Discovery & New Frontiers

America's Human Spaceflight Architecture

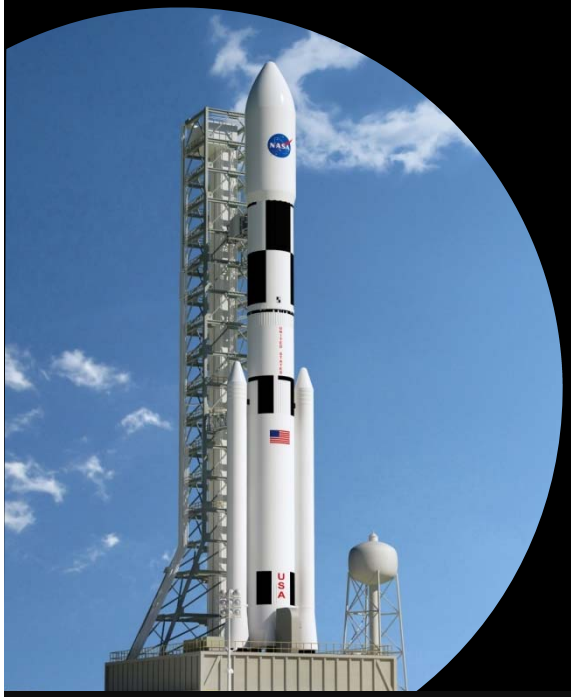
Commercial support for ISS in low-Earth orbit



SLS for reaching new destinations beyond low-Earth orbit

Ensuring our nation can send humans beyond Earth and into deep space.

Traveling To and Through Space



Space Launch System (SLS)

America's next human-rated heavy-lift rocket – safe, affordable, and sustainable for beyond Earth orbit exploration

Commercial Spaceflight

Partnering for success – sharing facilities and expertise

Research for the Future

New fuels, new manufacturing and test methods, and advanced concepts

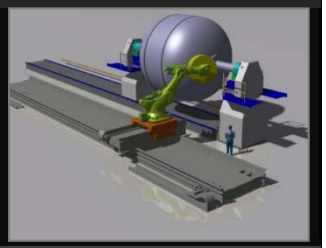
Launching SLS in 2017

Testing J2-X Upper Stage Engine

Supporting Commercial Spaceflight

Affordable Testing for Nuclear Fuel Prototypes

Collaborative Engineering Design



In-space Cryogenic Fuel Storage Concept

Marshall is leading our nation's propulsion capabilities.

Living and Working in Space

Supporting Life in Space

- International Space Station
  - Continual human presence since 2000
  - Completed in 2010
- Major U.S. nodes and modules
- Cleaning air and recycling water
- Environmental effects on people and materials

ISS Test Facility at Marshall

Node 3 Tranquility

Delivery of the ISS Cupola

Atmosphere Resource Recovery and Environmental Monitoring

Multi-purpose Logistics Module, Leonardo

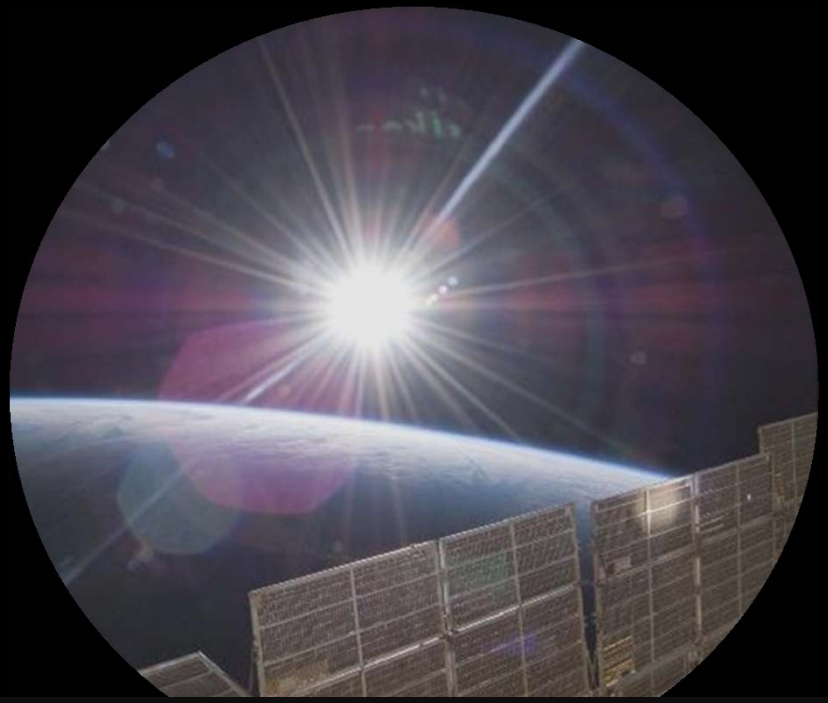
Environmental Control & Life Support System (ECLSS)

Marshall develops systems for living and working on the ISS.

Living and Working in Space

Supporting Scientific Research in Space

- Manage science operations around the clock
- Window Observational Research Facility
- Microgravity Science Glovebox
- Materials Science Research Rack



Payload Operations Center at Marshall

WORF – Window Observational Research Facility

EXPRESS Racks for Destiny Module

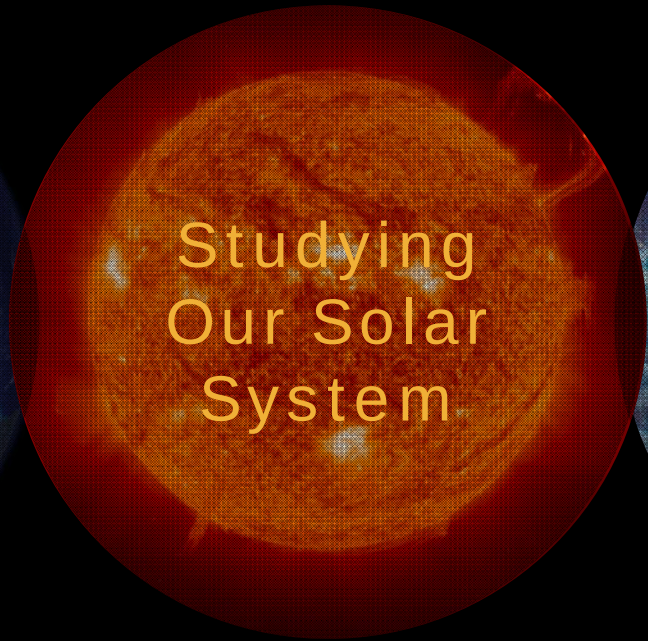
Materials Science Research Racks

Microgravity Science Glovebox

Destiny Laboratory

Marshall is the command post for science on the ISS.

Understanding Our World and Beyond



Weather & Climate Monitoring

SERVIR

SUMI Solar Capture

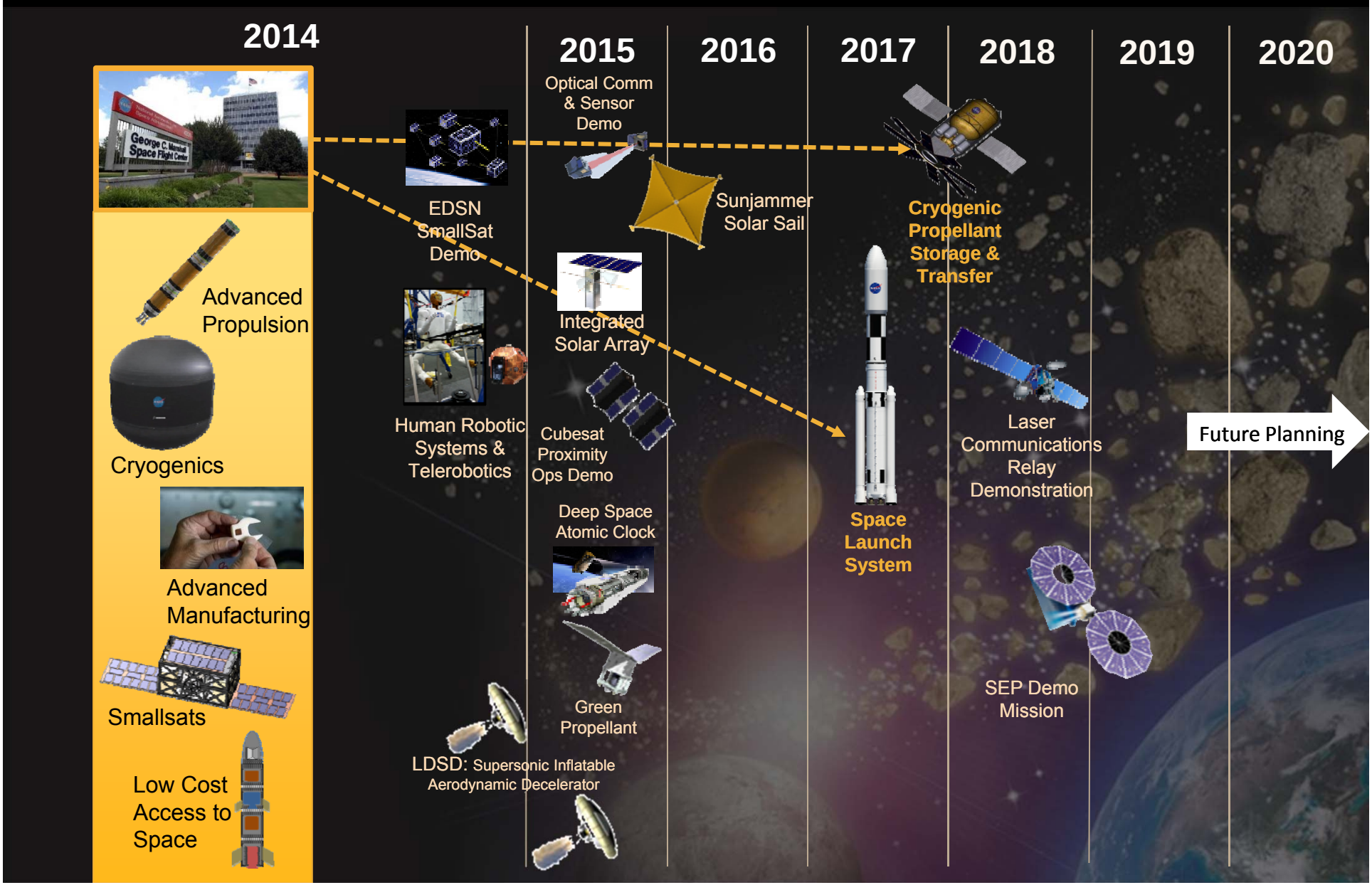
Discovery & New Frontiers

Chandra

James Webb Space Telescope

Marshall is expanding knowledge of our world and beyond.

Technology Events and Milestones



Benefitting Life on Earth – Technology Spinoffs

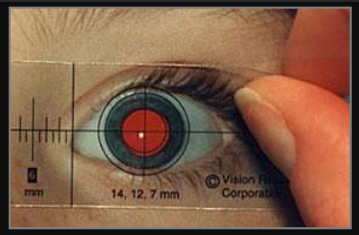
Space technology for newborns

Technologies developed at Marshall touch our lives in many ways.

Weather & Climate Monitoring

High-pressure fire hose nozzles

Kevlar™ Body Armor



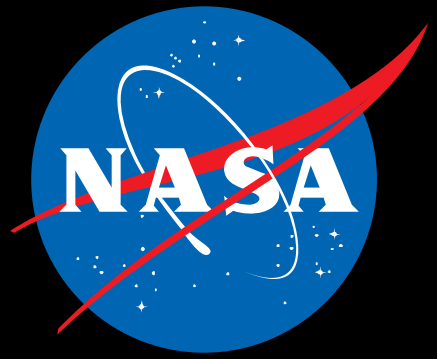
Improving Vision Screening

Healing Treatments

Water Filtration Systems

Science and exploration improves our lives and our planet.


Somewhere, something
Incredible is waiting to be known.
— Carl Sagan



www.nasa.gov/marshall