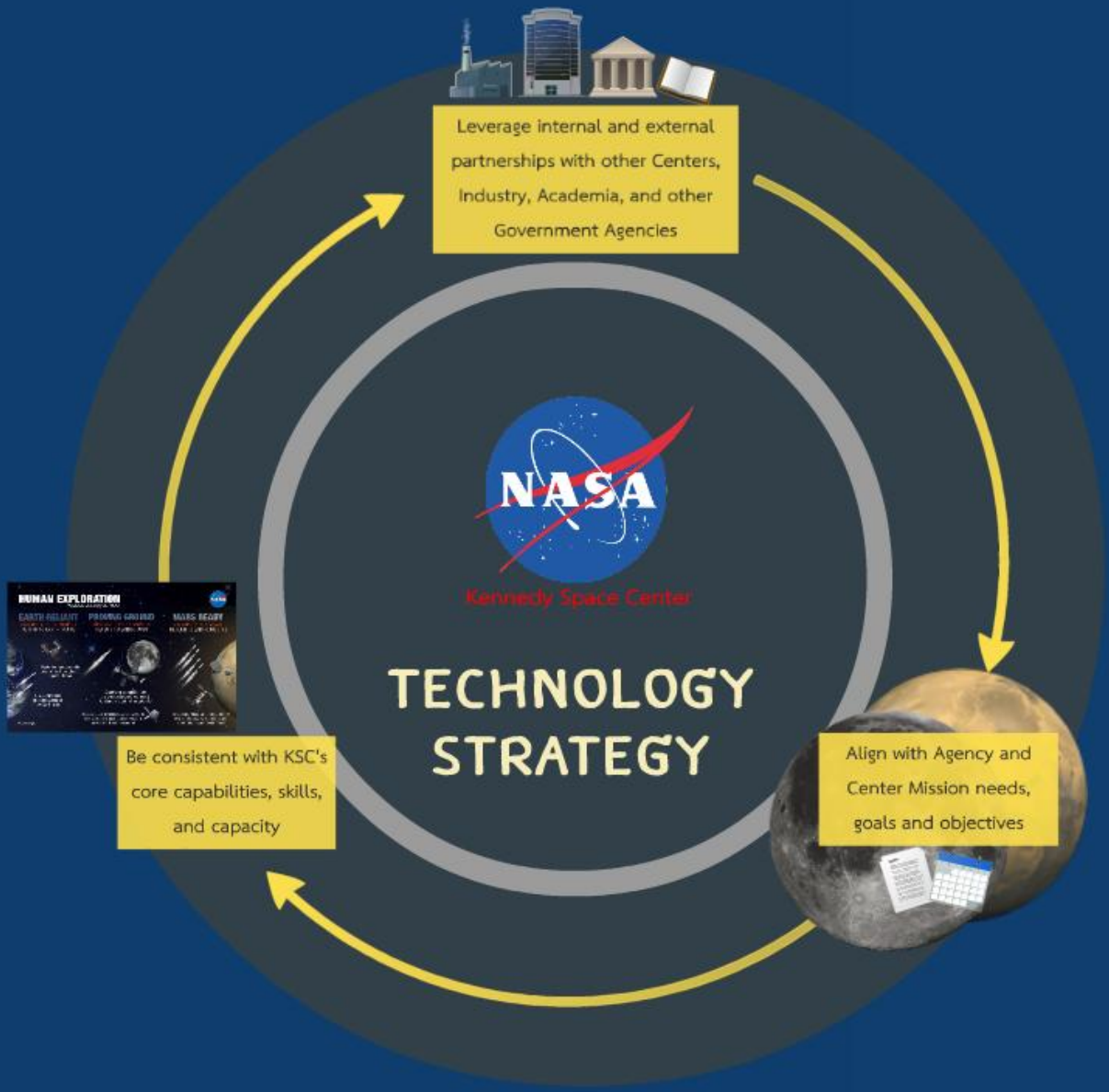

Leverage internal and external partnerships with other Centers, Industry, Academia, and other Government Agencies
NASA
Kennedy Space Center
TECHNOLOGY STRATEGY
Align with Agency and Center Mission needs, goals and objectives
Be consistent with KSC's core capabilities, skills, and capacity

HUMAN EXPLORATION

NASA's Journey to Mars

EARTH RELIANT

MISSION: 6 TO 12 MONTHS
RETURN TO EARTH: HOURS

Mastering fundamentals aboard the International Space Station

U.S. companies provide access to low-Earth orbit

PROVING GROUND

MISSION: 1 TO 12 MONTHS
RETURN TO EARTH: DAYS

Expanding capabilities by visiting an asteroid redirected to a lunar distant retrograde orbit

The next step: traveling beyond low-Earth orbit with the Space Launch System rocket and Orion spacecraft

MARS READY

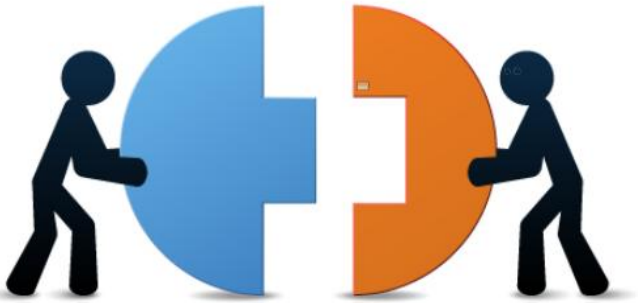
MISSION: 2 TO 3 YEARS
RETURN TO EARTH: MONTHS

Developing planetary independence by exploring Mars, its moons and other deep space destinations

www.nasa.gov

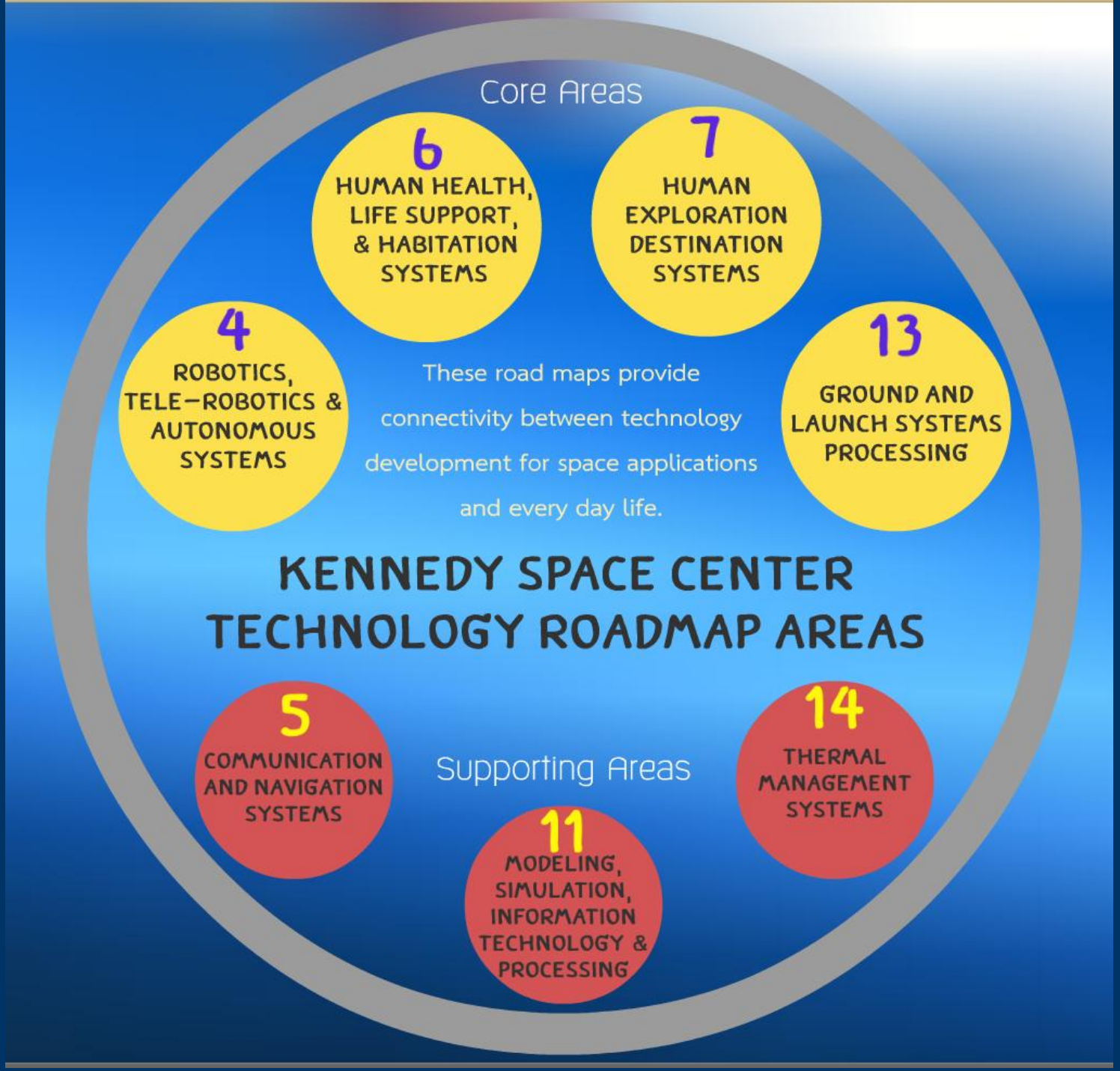
NASA

Kennedy Space Center



NASA Technology Roadmap Areas

TA 1 – Launch Propulsion Systems
TA 2 – In Space Propulsion Systems
TA 3 – Space Power & Energy Storage
TA 4 – Robotics, Tele-Robotics & Autonomous Systems
TA 5 – Communication and Navigation Systems
TA 6 – Human Health, Life Support & Habitation Systems
TA 7 – Human Exploration Destination Systems
TA 8 – Science Instruments, Observatories, & Sensor Systems
TA 9 – Entry, Descent & Landing
TA 10 – Nanotechnology
TA 11 – Modeling, Simulation, Information Technology & Processing
TA 12 – Materials, Structures, Mechanical Systems & Manufacturing
TA 13 – Ground and Launch Systems Processing
TA 14 – Thermal Management Systems
TA 15 – Aeronautics


Core Areas
6
HUMAN HEALTH, LIFE SUPPORT, & HABITATION SYSTEMS
7
HUMAN EXPLORATION DESTINATION SYSTEMS
4
ROBOTICS, TELE-ROBOTICS & AUTONOMOUS SYSTEMS
13
GROUND AND LAUNCH SYSTEMS PROCESSING
These road maps provide connectivity between technology development for space applications and every day life.
KENNEDY SPACE CENTER TECHNOLOGY ROADMAP AREAS
5
COMMUNICATION AND NAVIGATION SYSTEMS
Supporting Areas
14
THERMAL MANAGEMENT SYSTEMS
11
MODELING, SIMULATION, INFORMATION TECHNOLOGY & PROCESSING

4.1 SENSING AND PERCEPTION

4.1.4
Natural, Man-Made Object and Event Recognition

4.3 MANIPULATION

4.3.6 Sample Acquisition and Handling

4.5 SYSTEM-LEVEL AUTONOMY

4.5.3 Autonomous Guidance and Control

6.1 ENVIRONMENTAL CONTROL AND LIFE SUPPORT SYSTEMS AND HABITATION SYSTEMS

6.1.1 Air Revitalization

6.1.2 Water Recovery and Management

6.1.3 Waste Management

7.1 IN-SITU RESOURCE UTILIZATION

7.1.1 Destination Reconnaissance, Prospecting & Mapping

7.1.2 Human Exploration Destination Systems In-Situ Resource Acquisition

7.1.4 Manufacturing and Infrastructure Emplacement

7.2 SUSTAINABILITY AND SUPPORTABILITY

7.2.1.2 Logistics - Food Production and Preservation

7.2.1.3 Logistics - Reuse and Recycle

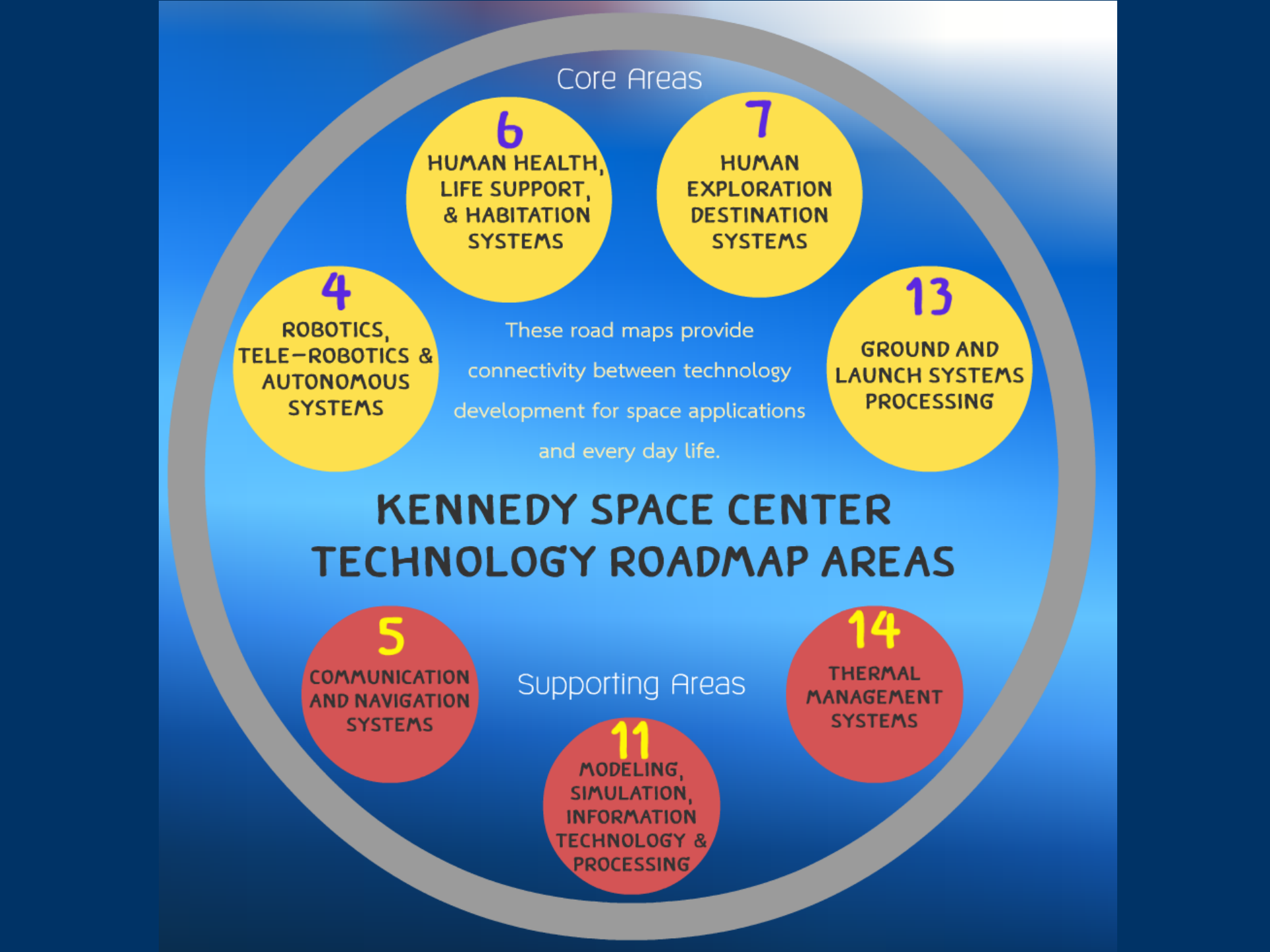
13.2 ENVIRONMENTAL PROTECTION AND GREEN TECHNOLOGIES

13.2.5 Curatorial Facilities, Planetary Protection and Clean Rooms

13.3 RELIABILITY AND MAINTAINABILITY

13.3.3 On-Site Inspection and Anomaly Detection and Identification

13.3.6 Repair, Mitigation, and Recovery Technologies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NASA

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Portfolio Approach

Technology Demonstration Missions TDM

Small Spacecraft Technology SST

Flight Opportunities FO

Centennial Challenges CC

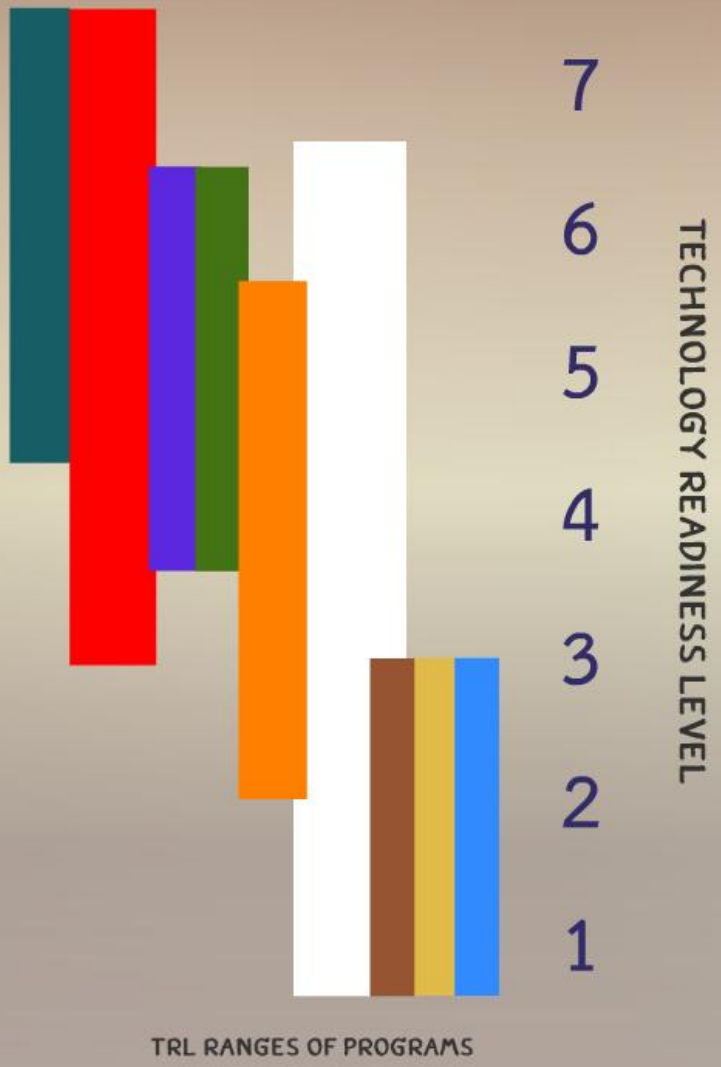
Game Changing Development GCD

SBIR/STTR

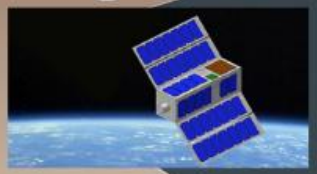
Center Innovation Fund CIF

NASA Innovative Advanced Concepts NIAC

Space Technology Research Grants STRG



Space Technology Programs

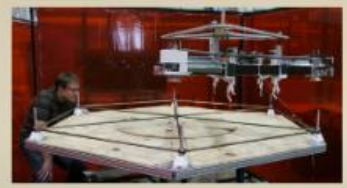


TECHNOLOGY DEMONSTRATION MISSIONS PROGRAM

SMALL SPACECRAFT TECHNOLOGY PROGRAM

GAME CHANGING DEVELOPMENT PROGRAM

Transformative & Crosscutting Technology Breakthroughs

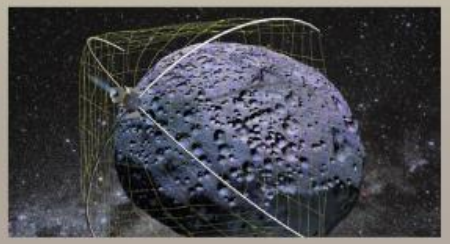


Pioneering Concepts/Developing Innovation Community

CENTER INNOVATION FUND PROGRAM

SPACE TECHNOLOGY RESEARCH GRANTS PROGRAM

NASA INNOVATIVE ADVANCED CONCEPTS (NIAC) PROGRAM



Creating Markets & Growing Innovation Economy

FLIGHT OPPORTUNITIES PROGRAM

CENTENNIAL CHALLENGES PRIZE PROGRAM

SMALL BUSINESS INNOVATION RESEARCH & SMALL BUSINESS TECHNOLOGY TRANSFER (SBIR/STTR) PROGRAM

TECHNOLOGY TRANSFER PROGRAM

BRINGING NASA TECHNOLOGY DOWN TO EARTH

NASA'S TECHNOLOGY TRANSFER PROGRAM ENSURES THAT TECHNOLOGIES DEVELOPED FOR MISSIONS IN EXPLORATION AND DISCOVERY ARE BROADLY AVAILABLE TO THE PUBLIC, MAXIMIZING THE BENEFIT TO THE NATION.

Discover Technologies

Patent Portfolio

Software Catalog

Success Stories

http://technology.nasa.gov/

IN SITU WIRE DAMAGE DETECTION AND REROUTING SYSTEM

Researchers at Kennedy Space Center have developed an in situ wire damage detection and rerouting system to monitor electrical faults in online or offline operation. A fault locator detects the occurrence of a fault and also determines the type and location of the fault. Faults can be repaired before they become serious problems.

Applications

- Aerospace Wiring
- Marine Wiring
- Automotive Wiring
- Industrial Wiring
- "Smart Grid" Wiring

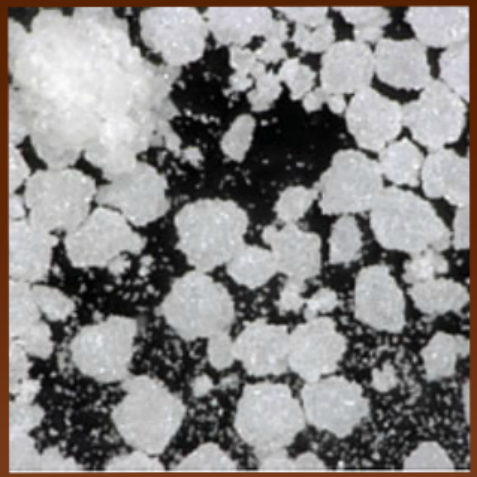
Benefits

- Online Operation – System can be used while wires are powered and operational, making it possible to locate intermittent faults that occur only while wires are in use.
- Nonintrusive – Faults are monitored in the background, using very low power signals that do not disrupt normal circuit operation.
- Intelligent – Pattern recognition algorithms autonomously identify the type and location of a fault without operator intervention. Data signals are automatically rerouted to a spare wire when a damaged active wire is detected.
- Intuitive – An easy-to-understand graphical user interface displays the reflected waveforms and provides information on the type of fault and its distance from the test signal injection point.
- Flexible – System is capable of monitoring up to 64 individual wires on a cable simultaneously in online or offline mode.

http://technology.ksc.nasa.gov/technology/TOPS_12866_13285_InSituWireDamage.htm

AMMONIA RECOVERY SYSTEM FOR WASTEWATER

Researchers at Kennedy Space Center have developed an ammonia capture/recovery system for wastewater to use on the International Space Station with potential for larger industrial and municipal wastewater needs.



Applications

- Agricultural wastewater (swine/ dairy farms, etc.)
- Food processing plants
- Fertilizer plants (urea)
- Chemical plants
- Textiles (wool)
- Electroplating
- Municipal wastewater

Benefits

- Higher capacity than traditional absorbents (multiple equivalents Ammonia/L substrate)
- Effective under varying influent ammonia concentrations (e.g., from 10s to 100,000s of ppm ammonia)
- Contact time of 20–30 minutes needed for complete removal, with similar times needed for regeneration
- Easily regenerated media, which allows for repeated use in the system
- Ammonia captured/recovered during media regeneration phase (ammonia can then be reused or sold)
- Less expensive and more selective for ammonia than typical ion-exchange resinse

http://technology.ksc.nasa.gov/technology/TOPS_13681_Ammonia_Recovery_System_Wastewater.htm

HIGH-PERFORMANCE POLYIMIDE POWDER COATINGS

Researchers at NASA's Kennedy Space Center have developed advanced powder coatings for longer-lasting, improved corrosion control. The results of preliminary tests of the coatings and their resistance to salt spray corrosion are very encouraging, and commercial partners are sought for further development.

Benefits

- Improved corrosion control
- Temperature resistance
- Chemical resistance
- Electrical stability
- Flame resistance
- Long-lasting protection

Applications

- Bridges
- Pipes and other infrastructure components
- Machinery
- Exposed metal parts and structures
- Automobile components

http://technology.ksc.nasa.gov/technology/TOPS_12777-Polyimide-Powder-Coating.html

NASA

Kennedy Space Center

Partnering with NASA

Partnership has always been a vital component of NASA's mission, whether it is through the infusion of new technologies into NASA, or the Agency transferring its technologies out for public benefit.

Either one of these types of partnerships may be ideal for your organization, and both provide access to NASA's world-class facilities, technical expertise, and technology transfer resources.

SBIR/STTR

THE INVESTMENT SEED FUND

CENTENNIAL CHALLENGES

INNOVATION TRANSFUSION

FACILITATED ACCESS TO THE SPACE ENVIRONMENT FOR TECHNOLOGY (FAST)

INNOVATIVE PARTNERSHIPS/AMBASSADOR PROGRAMS

LICENSING OPPORTUNITIES

NASA Project Calls

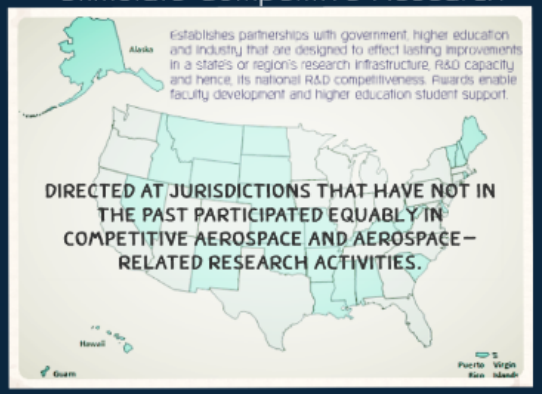
NASA solicits research through the release of various research announcements in a wide range of science and technology disciplines. A peer review process is used to evaluate and select proposals submitted in response to these announcements.

NSPIRES.NASAPRS.COM

Researchers can help NASA achieve national research objectives by submitting research proposals and conducting awarded research.

EPSCoR

Experimental Program to Stimulate Competitive Research



How to Partner with NASA

http://www.nasa.gov/offices/oct/partnership/how_to_partner/index.html

NASA Technologies

http://technology.nasa.gov

KSC Partnerships

http://kscpartnerships.ksc.nasa.gov

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