NASA
John F. Kennedy Space Center

Partnering with KSC in Research and Technology Development

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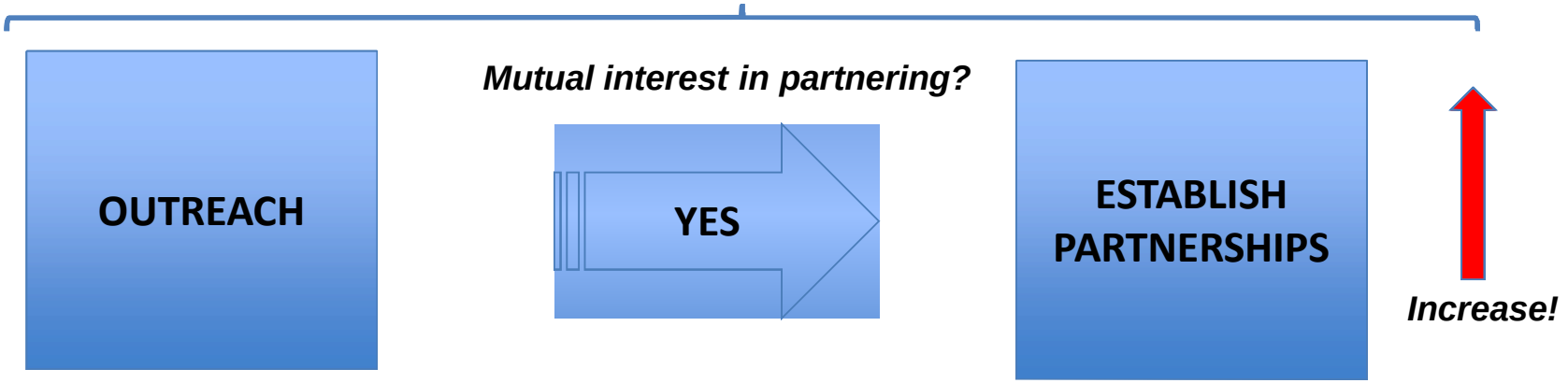
Innovative Partnerships Office
(IPO)

Innovative Partnerships Office (IPO)

Technology Objective:

Develop and commercialize technologies to address NASA and National Priority needs through strategic partnerships with industry, academia, other government agencies and national laboratories.

IPO Role



- **Communicate KSC R&TD interests/capabilities to external organizations**
- **Encourage organizations to identify overlapping interests by comparing their tech dev/research interests to ours**
- **Encourage external organizations to communicate these common R&TD interests to KSC**

- **Define collaboration ideas within common interest areas and their technical benefits**
- **Identify collaboration ideas that are feasible for KSC to pursue (i.e. solid business cases)**
- **Determine how to capitalize these collaborations**
- **Create legal instruments to authorize collaborations and establish IP rights**

Technical Benefits Through Partnerships

KSC Offerings

- Access to space environment; controlled air and land space
- World-class, one-of-a-kind facilities, laboratories, equipment
- Variety of distinctive research, technology, operational expertise
- Unique technologies
- Product test and validation
- Technical/research solutions
- Intell. Property
- Brand association
- Assist partner in achieving technology/research goals

Other…..
Academia
National Laboratories
Other Gov't Agencies
Industry

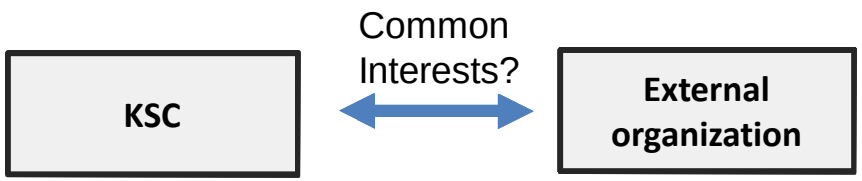
Partner Offerings

- Facilities
- Technology
- Expertise
- Services
- Innovation
- Technical/research solutions
- Intell. Property
- Outreach
- Assist KSC in achieving technology/research goals

Overview of the IPO
Partnership Development Process

IPO Partnership Development Process

1. Identify overlapping R&TD interests:



KSC
- Convey KSC interest in collaborations
- Introduce KSC R&TD interest areas and capabilities

You
- Visit IPO website to review complete list of KSC R&TD interest areas and capabilities:

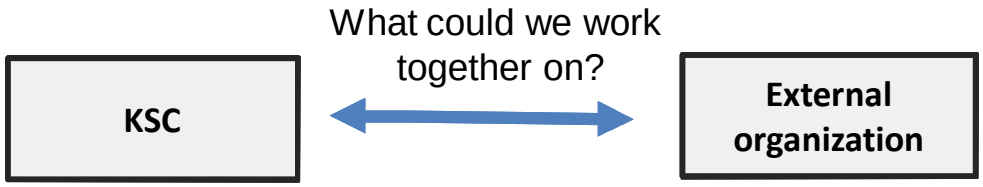
technology.ksc.nasa.gov

You
- Compare our interests with your R&TD interests and identify common R&TD areas of interest or problems we want to solve

You
- Contact IPO (see last slide) to discuss your R&TD interests that seem to align with KSC interests

IPO Partnership Development Process

2. For common R&TD interest areas, we will define/discuss possible collaboration ideas:



KSC & You

- What potential technical benefits would either party receive by working together in a collaborative manner in a common interest area? (see slide #4)

KSC & You

- What collaborative work ideas could we pursue that would deliver those benefits?

KSC & You

- Understand - at a high-level - the resources that would be needed for these collaboration ideas (personnel expertise, labs, facilities, etc)

IPO Partnership Development Process

3. For defined collaboration ideas, we will identify those with a valid business case for KSC participation:

KSC
- Will a proposed collaboration idea advance technologies or research of interest to NASA, or otherwise assist KSC in sustaining critical facilities, laboratories and equipment?

KSC
- Are needed KSC resources available to support a collaboration?

KSC
- Are the technical benefits provided by KSC to the collaboration "unique" (i.e. KSC provided technical benefits are not readily available in the private sector)?

KSC
- A valid business case for KSC participation is established when all three questions above are **YES**

IPO Partnership Development Process

4. For defined collaboration ideas with valid business cases, we will come to agreement on how to capitalize the efforts:

KSC & You

- Shared costs
  - *Both parties agree to fund a percentage of the total project cost*
  - *Project work provides significant technical benefit to both parties (see slide #4)*

KSC & You

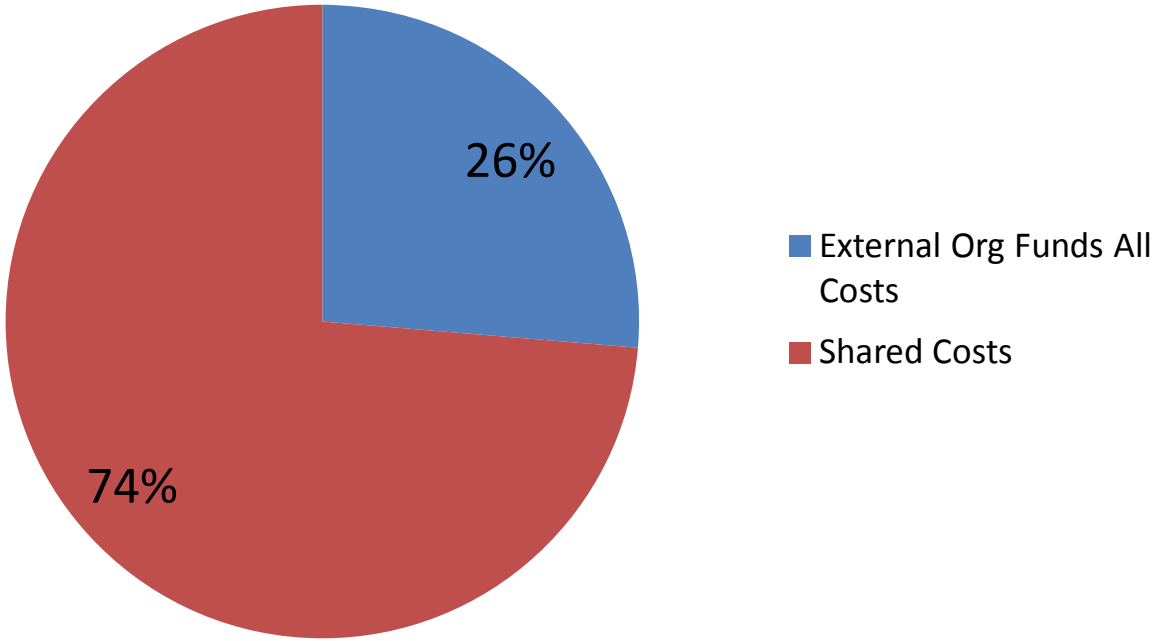
- External organization funds all costs
  - *External organization must reimburse KSC for KSC costs associated with the project*
  - *Project work provides significant technical benefit to external organization with minimal benefit to NASA*

KSC & You

- KSC funds all costs
  - *KSC procures services from the external organization using a contract and funds all costs associated with the project*
  - *Project work provides primary benefit to NASA and external organization contribution is legally defined as a service that the gov should pay for*

Capitalizing Partnerships

Recent Partnership Capitalization



IPO Partnership Development Process

5. Once we agree on how to capitalize our collaborative efforts, KSC will put the needed legal instruments in place to authorize the collaborations…and then we're ready to implement the project work:

KSC	• Determine required legal instruments (Space Act Agreements are most common)
KSC & You	• Formulate the legal instrument
KSC & You	• Ensure Intellectual Property for all parties is protected
KSC	• Obtain NASA approvals to proceed
KSC & You	• Implement partnerships

Initiate the Process Through

IPO Outreach

IPO Partnership Development Process

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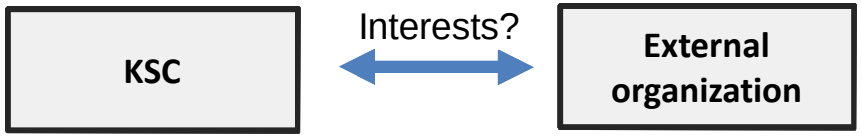

WE ARE INITIATING THIS STEP

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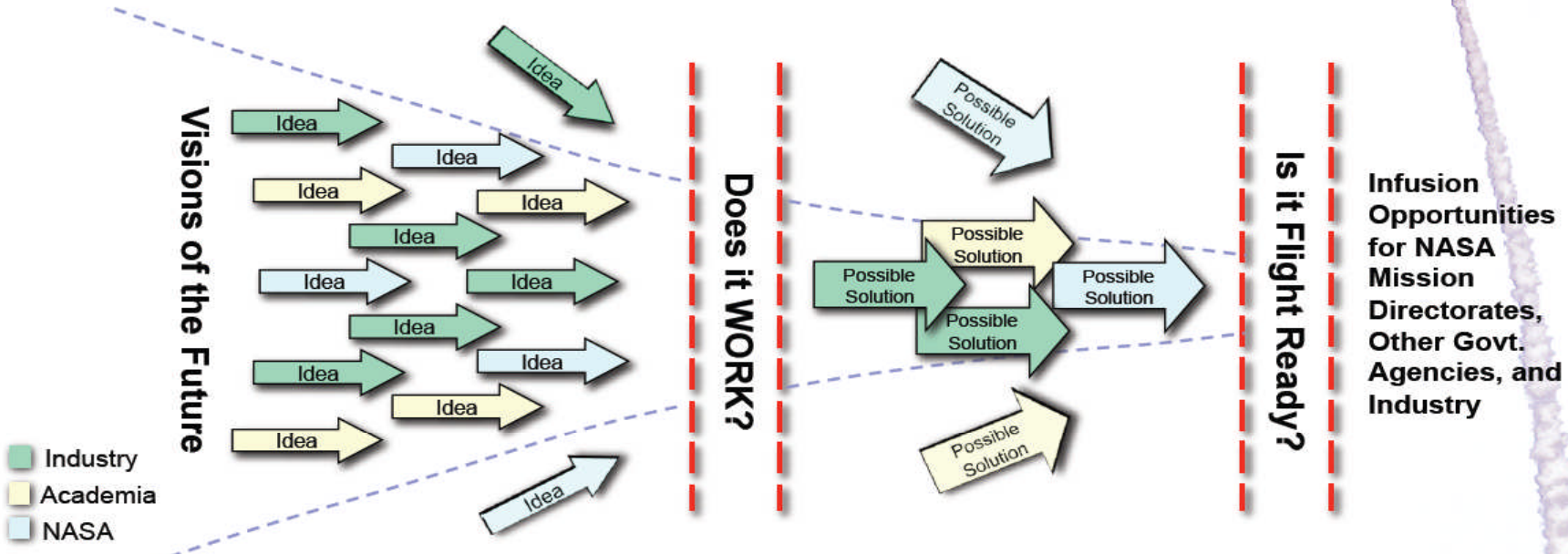
Space Technology Development Approach



Creative ideas regarding future NASA systems or solutions to national needs.

Prove feasibility of novel, early-stage ideas with potential to revolutionize a future NASA mission and/or fulfill national need.

Mature crosscutting capabilities that advance multiple future space missions to flight readiness status

Draft NASA Space Technology Roadmap (STR)
Technology Area Breakdown Structure

TA01 

• LAUNCH PROPULSION SYSTEMS

TA02 

• IN-SPACE PROPULSION TECHNOLOGIES

TA03 

• SPACE POWER & ENERGY STORAGE

TA04 

• ROBOTICS, TELE-ROBOTICS & AUTONOMOUS SYSTEMS

TA05 

• COMMUNICATION & NAVIGATION

TA06 

• HUMAN HEALTH, LIFE SUPPORT & HABITATION SYSTEMS

TA07 

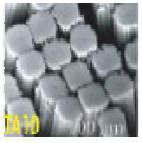
• HUMAN EXPLORATION DESTINATION SYSTEMS

TA08 

• SCIENCE INSTRUMENTS, OBSERVATORIES & SENSOR SYSTEMS

TA09 

• ENTRY, DESCENT & LANDING SYSTEMS

TA10 

• NANOTECHNOLOGY

TA11 

• MODELING, SIMULATION, INFORMATION TECHNOLOGY & PROCESSING

TA12 

• MATERIALS, STRUCTURES, MECHANICAL SYSTEMS & MANUFACTURING

TA13 

• GROUND & LAUNCH SYSTEMS PROCESSING

TA14 

• THERMAL MANAGEMENT SYSTEMS

Denotes NASA KSC involvement on team

KSC Research and Technology Development Areas of Interest *

- Storage, Distribution and Conservation of Fluids
- Materials for Life Cycle Optimization
- Life Sciences & Habitation Systems
- Remediation and Ecosystem Sciences
- In-Situ Resource Utilization and Surface Systems
- Life Cycle Optimization of Products, Projects, and Programs
- Space Launch and Suborbital Technologies
- Tracking, Timing, Communications (TT&C) and Navigation Technologies

* The order does not denote priority

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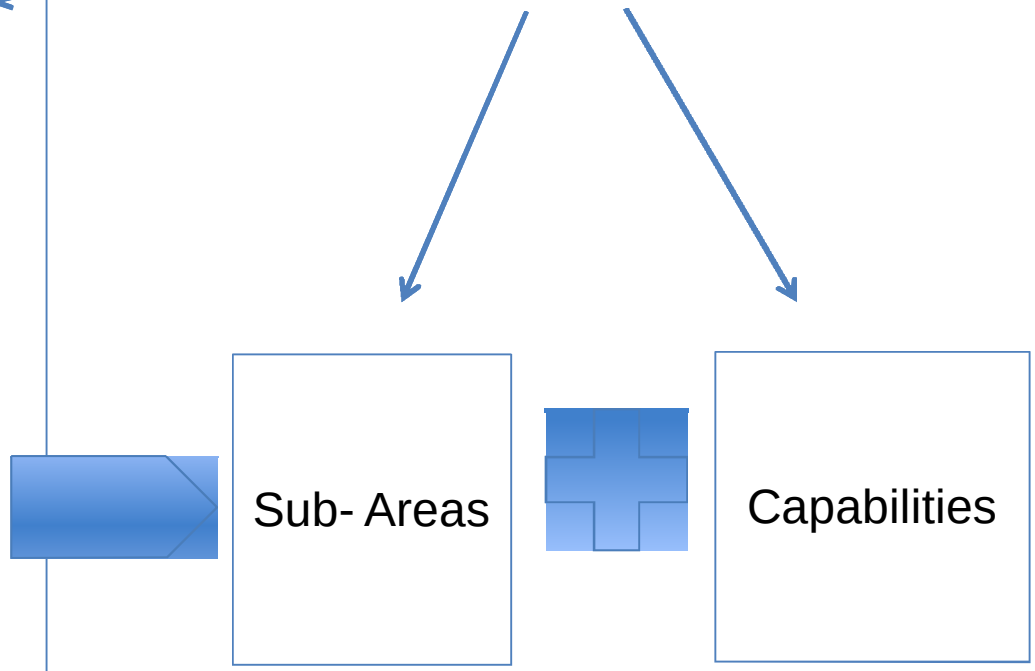
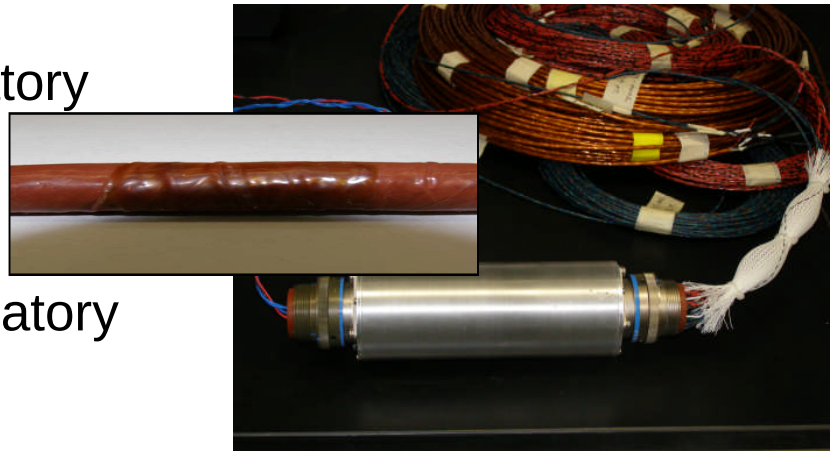


Examples of KSC

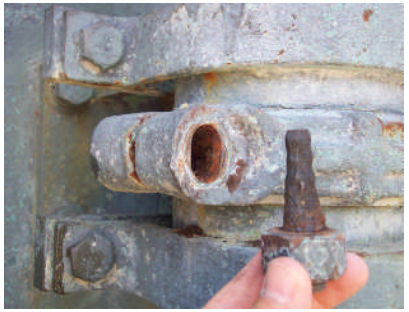
Technology Development Capabilities
Posted on Our Website

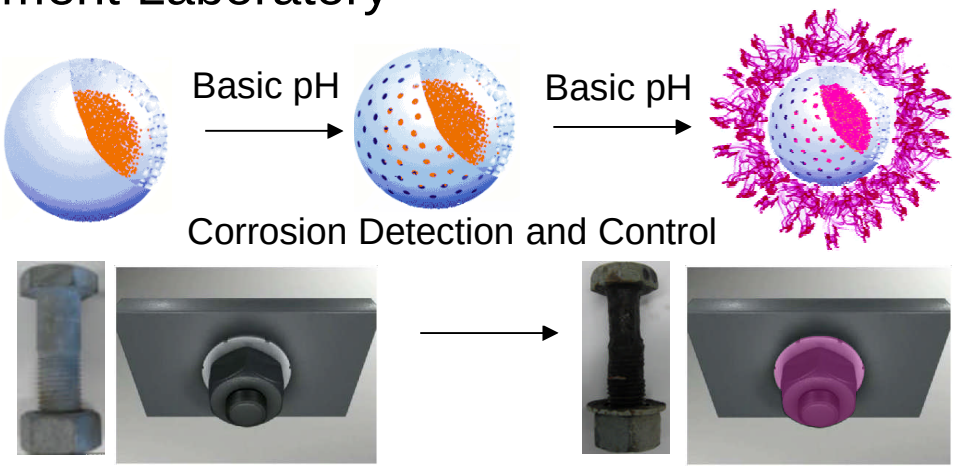
Materials for Life Cycle Optimization Capabilities

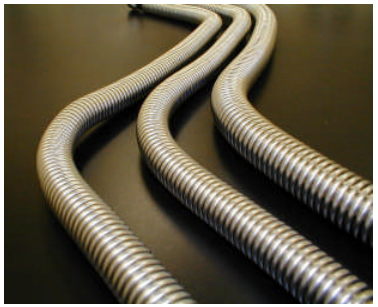
- Applied Physics Laboratory
- Polymer Science and Technology Laboratory
- Nondestructive Evaluation Laboratory
- Materials Failure Analysis Laboratory
- Electrostatics and Surface Physics Laboratory
- Electromagnetic Effects Laboratory
- Corrosion Technology Laboratory
- Chemical Test and Analysis Laboratory
- Applied Chemistry Laboratory
- Prototype Development Laboratory
- Cryogenic Testing



Wire Fault Repair and Detection System



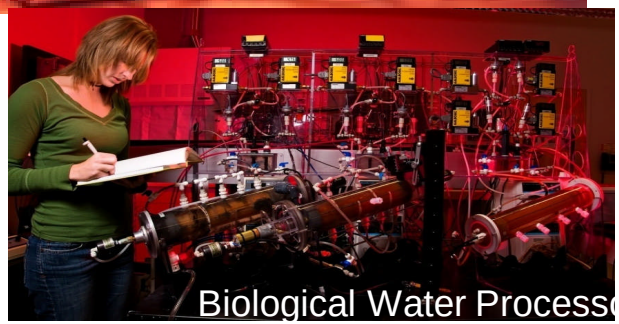




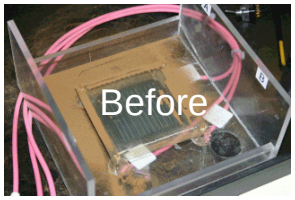
Insulation Systems for High Efficiency Long-Length Flexible Piping

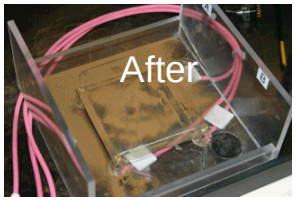
Life Sciences and Habitation Systems Capabilities

- Biomedical Research Laboratory
- Atomic Force Microscopy
- Dynamic Light Scattering System
- Post Flight Biomedical Data Collection Facility
- Medical Device Development & Testing
- Environmental Microbiology Laboratory
- Metrology Laboratory
- Polymer Science and Technology Laboratory
- Flight Experiment Development Laboratory
- Electrostatics and Surface Physics Laboratory
- Electromagnetic Effects Laboratory
- Applied Chemistry Laboratory
- Granular Mechanics and Regolith Operations
- Aerospace Medicine and Biomedical
- Engineering Expertise



Dust Tolerant Connector





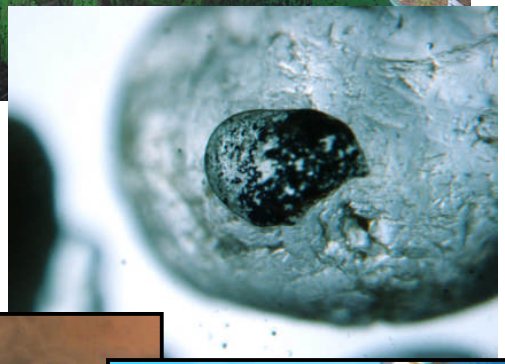
Dust Mitigation Technology on Solar Panel

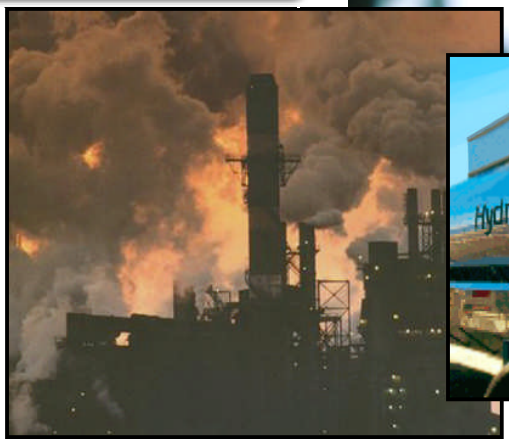
ResQPod increases blood circulation to brain

Remediation and Ecosystem Sciences Capabilities

- Polymer Science and Technology
- Laboratory
- Nondestructive Evaluation Laboratory
- Materials Failure Analysis Laboratory
- Chemical Test and Analysis Laboratory
- Applied Chemistry Laboratory
- Environmental Microbiology Laboratory
- Corrosion Technology Laboratory
- Controlled Environment Laboratory
- Experience with Dense Non Aqueous
- Phase Liquid (DNAPL) sites
- Experience with complex groundwater contamination investigative techniques
- Experience with implementation of innovative remediation technologies
- Serve as a test bed for pilot tests

Emulsified Zero Valent Iron
NASA's Commercial Invention of the Year - 2005

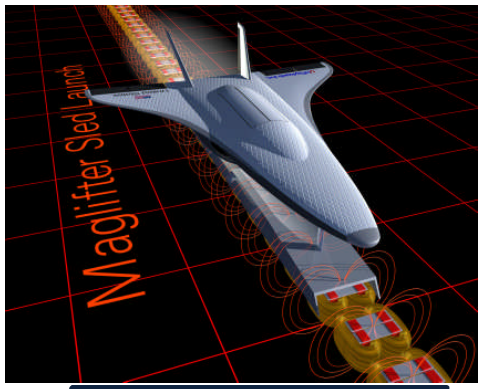




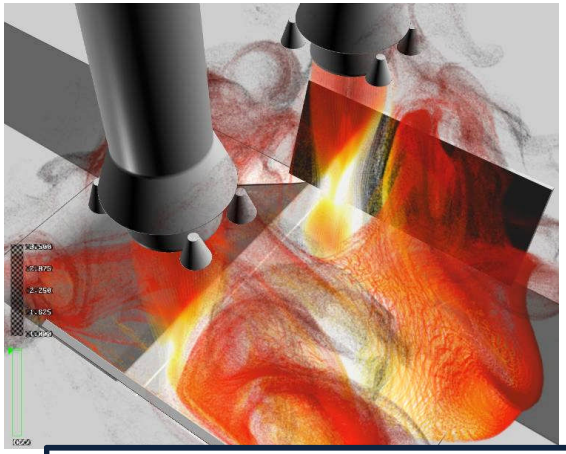
Emission Control Technology
For elimination of hazardous waste stream of hypergols has application for coal-fired power plants

Space Launch and Suborbital Technologies Capabilities

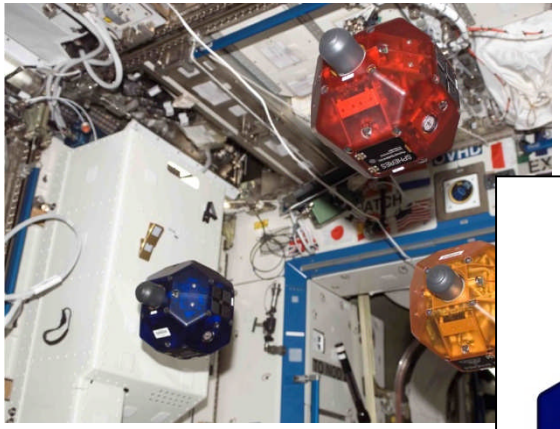
- Mechanical, Structural and Controls Development Laboratory
- Flight Experiment Development Laboratory
- Electrostatics and Surface Physics
- Cryogenics Test Laboratory
- Chemical Test and Analysis Laboratory
- Applied Chemistry Laboratory



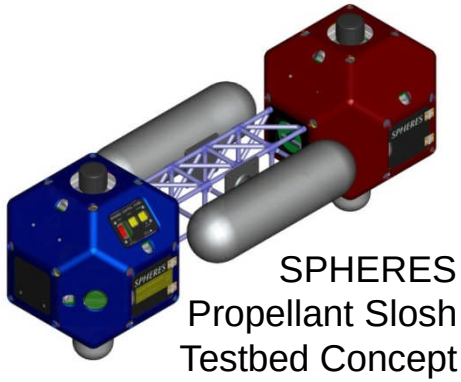
eLaunch Hypersonic Launch Vehicle Concept



CFD Analysis of Ignition Overpressure within Solid Rocket Booster (SRB) Flame Trench Environment



Synchronized Position Hold Engage and Reorient Experimental Satellites (SPHERES) facility onboard ISS



SPHERES Propellant Slosh Testbed Concept

IPO Partnership Development Process

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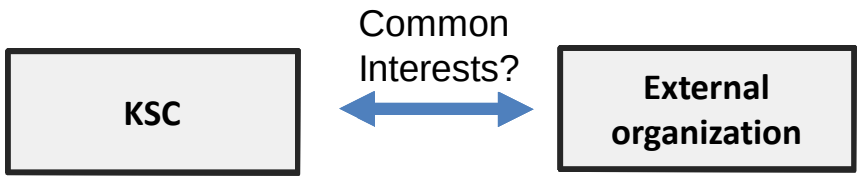

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Innovative Partnerships Office (IPO) Contacts

We want to hear from you!*

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OR

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** Send us brief (1-2 paragraphs) descriptions of collaboration ideas via email*