

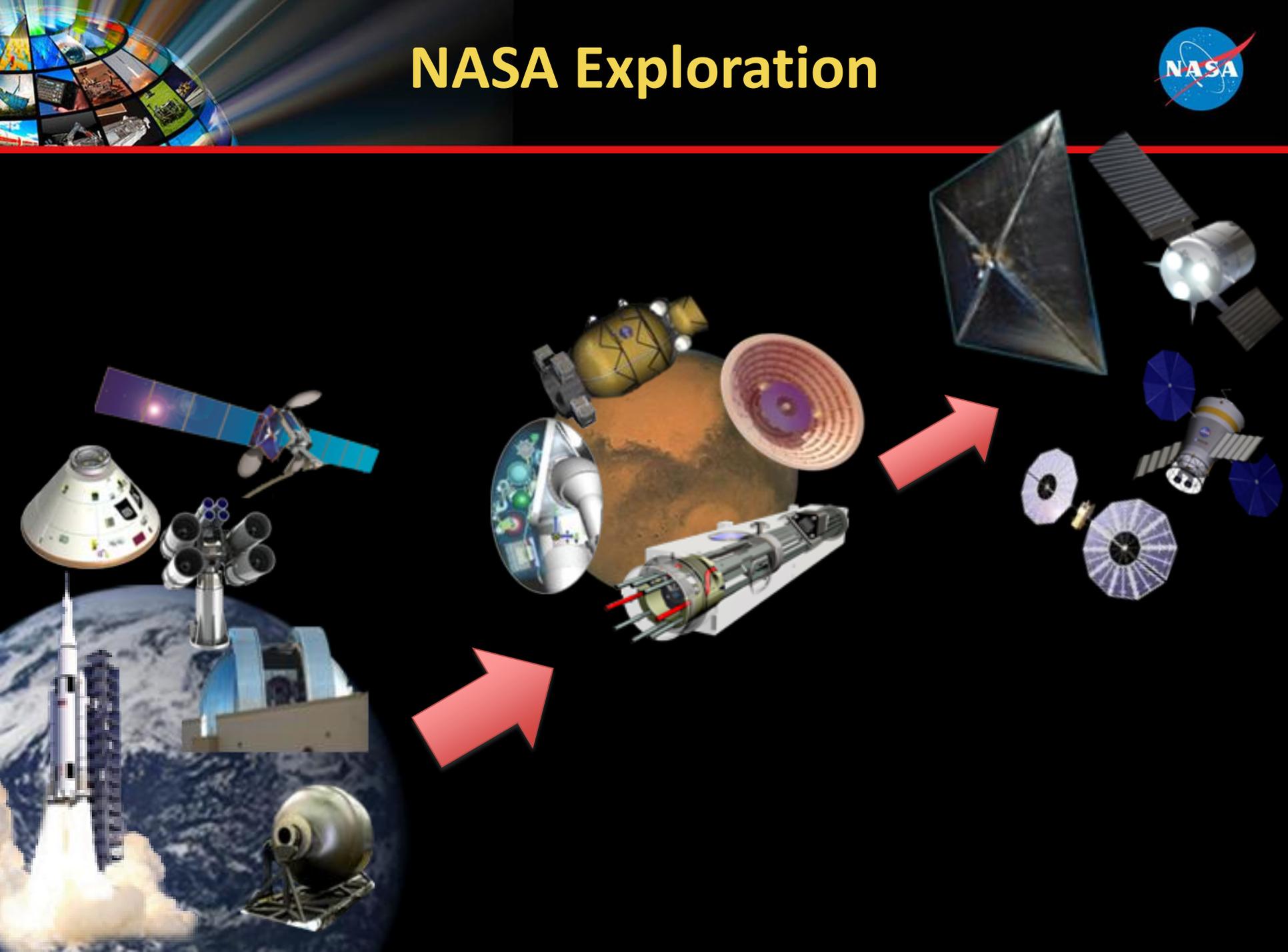


# Space Technology

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**Space Technology Program Director**  
**NASA Headquarters**  
**Washington D.C.**

**NASA TECHNOLOGY DAYS 2012**  
**Cleveland, Ohio**

# NASA Exploration



# New Hardware in Advancing Space Technology



Cryogenic tank



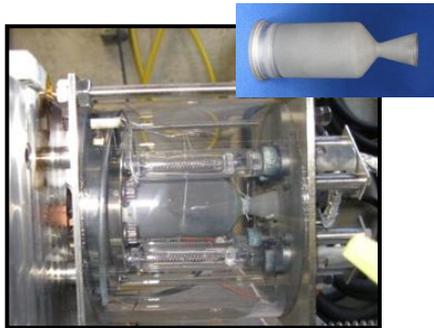
Composite Strut  
Structural Testing



Low Density Supersonic  
Decelerator Proof Test



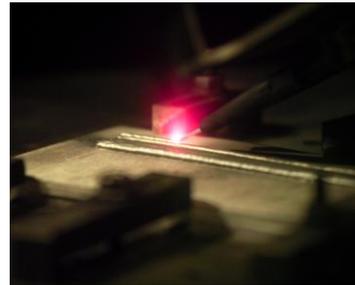
MSL heatshield with  
instrumentation



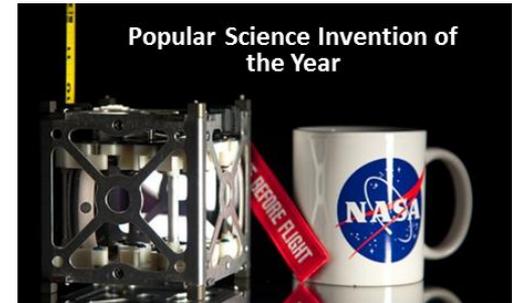
Green Propellant 22N  
thruster



Telerobotic Systems



Additive Manufacturing



Popular Science Invention of  
the Year



Deep Space  
Atomic  
Clock



System Test of  
Inflatable Re-  
entry Vehicle  
Experiment



Solar Sail and Boom Fab



Exoskeleton

# Technology Demonstration and Testing



Mike Fossum with Smart SPHERES checkout



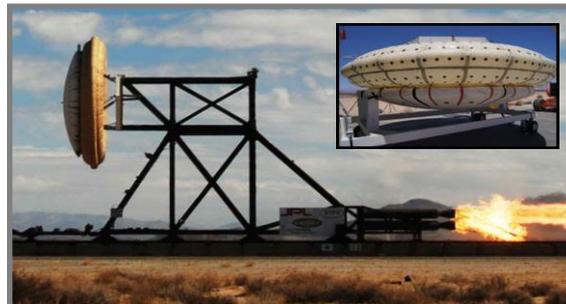
R2 using air flow meter



Reduced Liquid Hydrogen boil off test



ARC Jet Testing



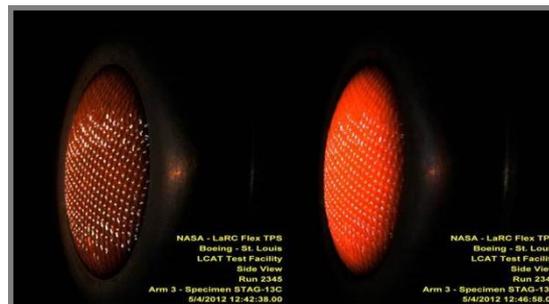
Low Density Supersonic Decelerator Sled Test



MISSE-X



K10 rover deploying polyimide film



LCAT Stagnation Test (50 W/cm<sup>2</sup>)



MSL Launch and MEDLI measurements successfully completed



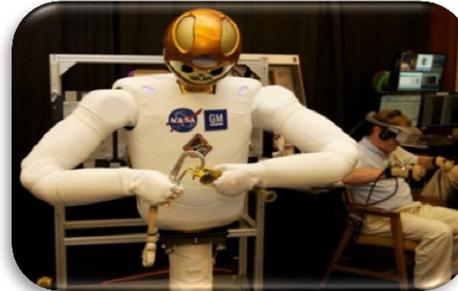
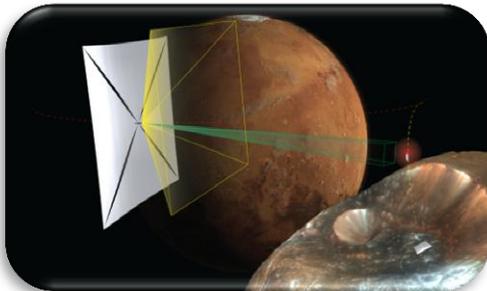
# Working Together to Innovate



# Space Technology Program

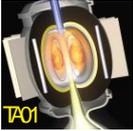
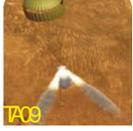
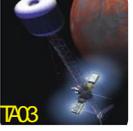
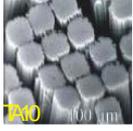


- **Adheres to a Stakeholder Based Investment Strategy:** NASA Strategic Plan, NASA Space Technology Roadmaps / NRC Report and Strategic Space Technology Investment Plan
- **Invests in a Comprehensive Portfolio:** Covers low to high TRL, student fellowships, grants, prize competitions, prototype developments, and technology demonstrations
- **Advances Transformative and Crosscutting Technologies:** Enabling or broadly applicable technologies with direct infusion into future missions
- **Merit Based Competition:** Research, innovation and technology maturation open to academia, industry, NASA centers and other government agencies
- **Executes with Structured Projects:** Clear start and end dates, defined budgets and schedules, established milestones, and project authority and accountability.
- **Informed Risk Taking:** Rapid cadence of technology maturation and infusion, informed risk tolerance to infuse as quickly as possible
- **Positions NASA at the cutting edge of technology:** Results in new inventions, enables new capabilities and creates a pipeline of innovators for National needs



# Space Technology Technical Areas

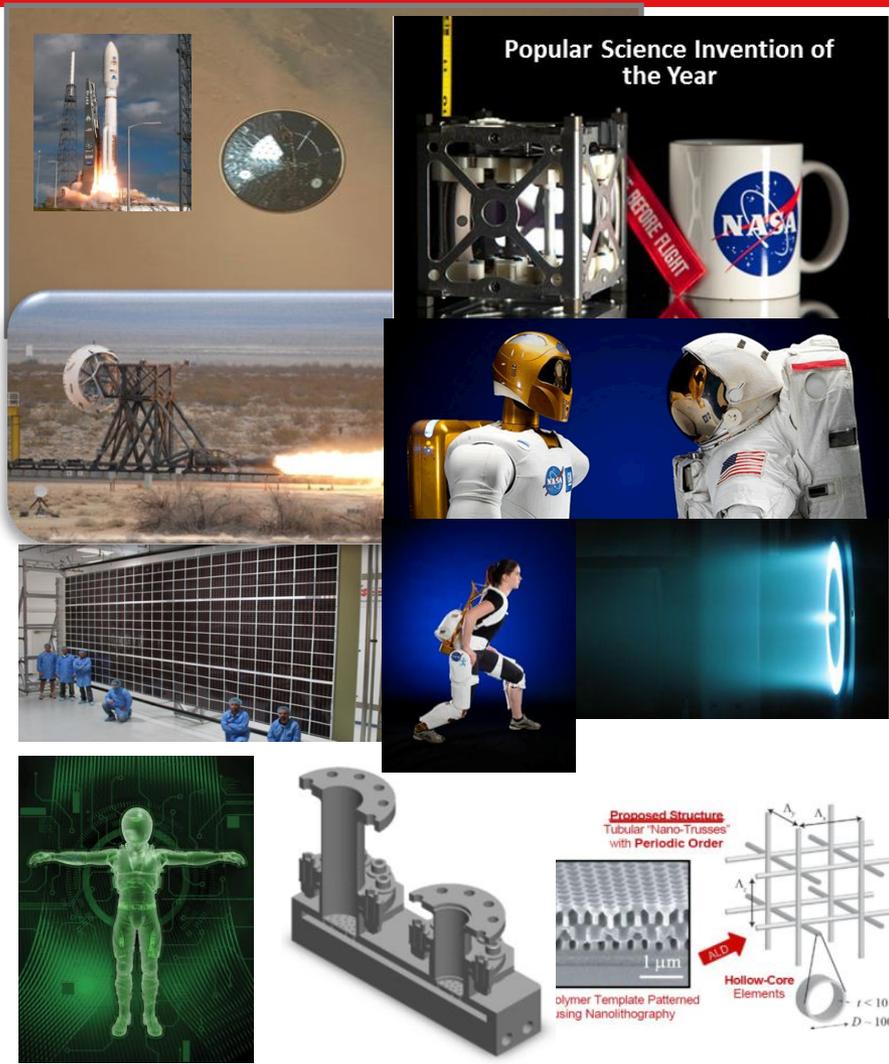
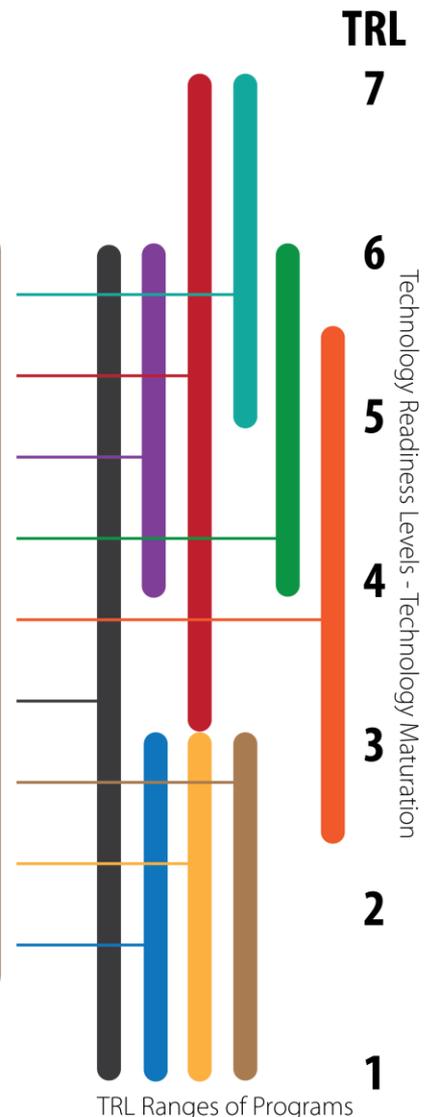


- |      |   |   |      |   |   |
|------|---|---|------|---|---|
| TA01 |    | • LAUNCH PROPULSION SYSTEMS                       | TA08 |    | • SCIENCE INSTRUMENTS, OBSERVATORIES & SENSOR SYSTEMS       |
| TA02 |    | • IN-SPACE PROPULSION TECHNOLOGIES                | TA09 |    | • ENTRY, DESCENT & LANDING SYSTEMS                          |
| TA03 |    | • SPACE POWER & ENERGY STORAGE                    | TA10 |    | • NANOTECHNOLOGY  |
| TA04 |    | • ROBOTICS, TELE-ROBOTICS & AUTONOMOUS SYSTEMS    | TA11 |    | • MODELING, SIMULATION, INFORMATION TECHNOLOGY & PROCESSING |
| TA05 |   | • COMMUNICATION & NAVIGATION                      | TA12 |   | • MATERIALS, STRUCTURES, MECHANICAL SYSTEMS & MANUFACTURING |
| TA06 |  | • HUMAN HEALTH, LIFE SUPPORT & HABITATION SYSTEMS | TA13 |  | • GROUND & LAUNCH SYSTEMS PROCESSING                        |
| TA07 |  | • HUMAN EXPLORATION DESTINATION SYSTEMS           | TA14 |  | • THERMAL MANAGEMENT SYSTEMS                                |

# Portfolio Approach



Technology Demonstration Missions	<b>TDM</b>
Small Spacecraft Technology	<b>SST</b>
Flight Opportunities	<b>FO</b>
Centennial Challenges	<b>CC</b>
Game Changing Development	<b>GCD</b>
<b>SBIR/STTR</b>	
Center Innovation Fund	<b>CIF</b>
NASA Innovative Advanced Concepts	<b>NIAC</b>
Space Technology Research Grants	<b>STRG</b>



# Space Technology Programs



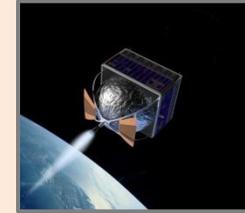
Transformative &  
Crosscutting  
Technology  
Breakthroughs



**Game Changing  
Development  
Program**



**Technology  
Demonstration  
Missions Program**

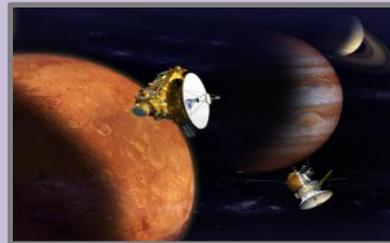


**Small Spacecraft  
Technologies  
Program**

Pioneering Concepts/  
Developing  
Innovation  
Community



**Space Technology  
Research Grant  
Program**



**NASA Innovative  
Advanced Concepts  
(NIAC) Program**



**Center Innovation  
Fund Program**

Creating Markets &  
Growing Innovation  
Economy



**Centennial  
Challenges Prize  
Program**



**Small Business Innovation Research  
& Small Business Technology  
Transfer (SBIR/STTR) Program**



**Flight Opportunities  
Program**