Small Business Innovation Research & Small Business Technology Transfer

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NASA STTR Overview | March 26, 2019

SBIR / STTR Programs Vision and Mission

VISION

Empower small businesses to deliver technological innovation that contributes to NASA's missions, provides societal benefit, and grows the US economy.

MISSION

Create opportunities through SBIR/STTR awards to leverage small business knowledge and technology development for maximum impact and contribution

NASA's SBIR and STTR programs have awarded **more than $3.3 billion** to research-intensive American small businesses

Engineers and scientists from **more than 12,000** small businesses in all 50 States, DC and Puerto Rico have participated

The STTR Program

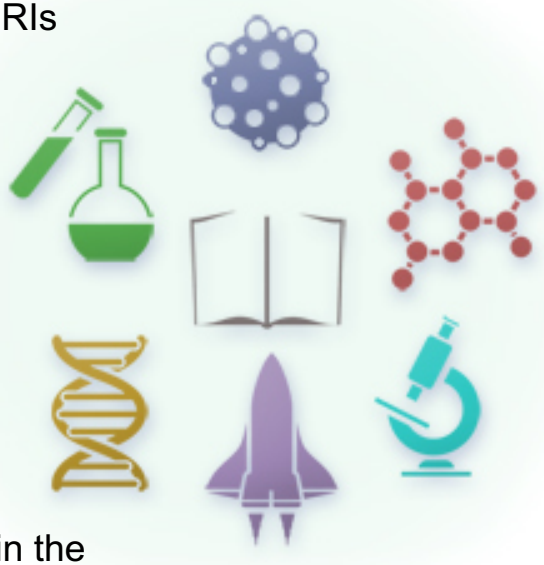
Small Business Technology Transfer (STTR)

- STTR facilitates cooperative R&D between small business concerns and U.S. research institutions – with potential for commercialization
- For FY18, 0.45% of the extramural research budget for all agencies with a budget greater than $1B per year (5 federal agencies presently participate)
- The STTR program has a statutory requirement to stimulate a partnership of ideas and technologies between innovative small business concerns (SBCs) and Research Institutions through Federally-funded research or research and development (R/R&D).
- STTR also adheres to SBA directives to increase participation by Women-Owned, Veteran-Owned and Small Disadvantaged Businesses and outreach to HBCUs and Minority Serving Institutions. Outreach is also made to under represented areas/regions of the country.

Why Should You Participate in STTR?

For the Small Business Concerns

- Opportunity to Leverage expertise and innovative ideas from Professors/Research Staff/Students
- Opportunity to leverage specialized facilities and experimental equipment at the Research Institutions (RIs) when often SBCs may not be able to afford such facilities on their own
- Opportunity to Create Pipeline of Usable Talent for Company from the RIs
- Develop working relationship & credibility with government R&D
- Fosters partnerships with large corporations and academia
- Provides recognition and visibility for your business
- Participation attracts venture capital and other funding sources

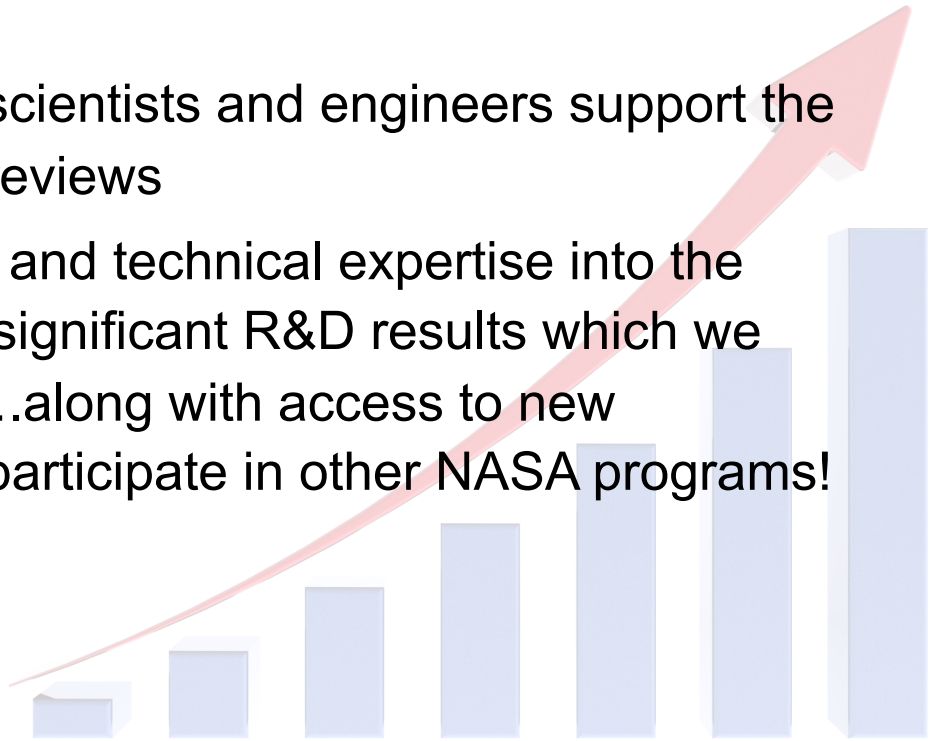


For the Research Institutions

- Opportunity to Create/Inspire Entrepreneurship as a vital part of the Educational Experience
- Another opportunity to access federal funding for research
- An opportunity sometimes to get RI Intellectual Property (IP) involved in the project and licensed
- Another means for visibility in the research community, generate peer-reviewed pubs., etc.

NASA Program Background

- NASA's SBIR and STTR programs have awarded more than **$3.3B** to research-intensive American small businesses to date; STTR makes up close to **$300M** of that figure
- Engineers and scientists from more than 12,000 Firms in all 50 States, DC, and Puerto Rico have participated across the two programs
- Each year about 1,700 NASA scientists and engineers support the program performing technical reviews
- NASA invests significant funds and technical expertise into the program and is rewarded with significant R&D results which we infuse into our programs…….along with access to new businesses and RIs who may participate in other NASA programs!



Agency SBIR / STTR Differences

CONTRACTING AGENCIES

- Agency establishes plans, protocols, requirements
- Highly focused topics
- Procurement mechanism for DOD
- More fiscal requirements

NASA, DoD, HHS/NIH, ED, EPA, DOT, DOC

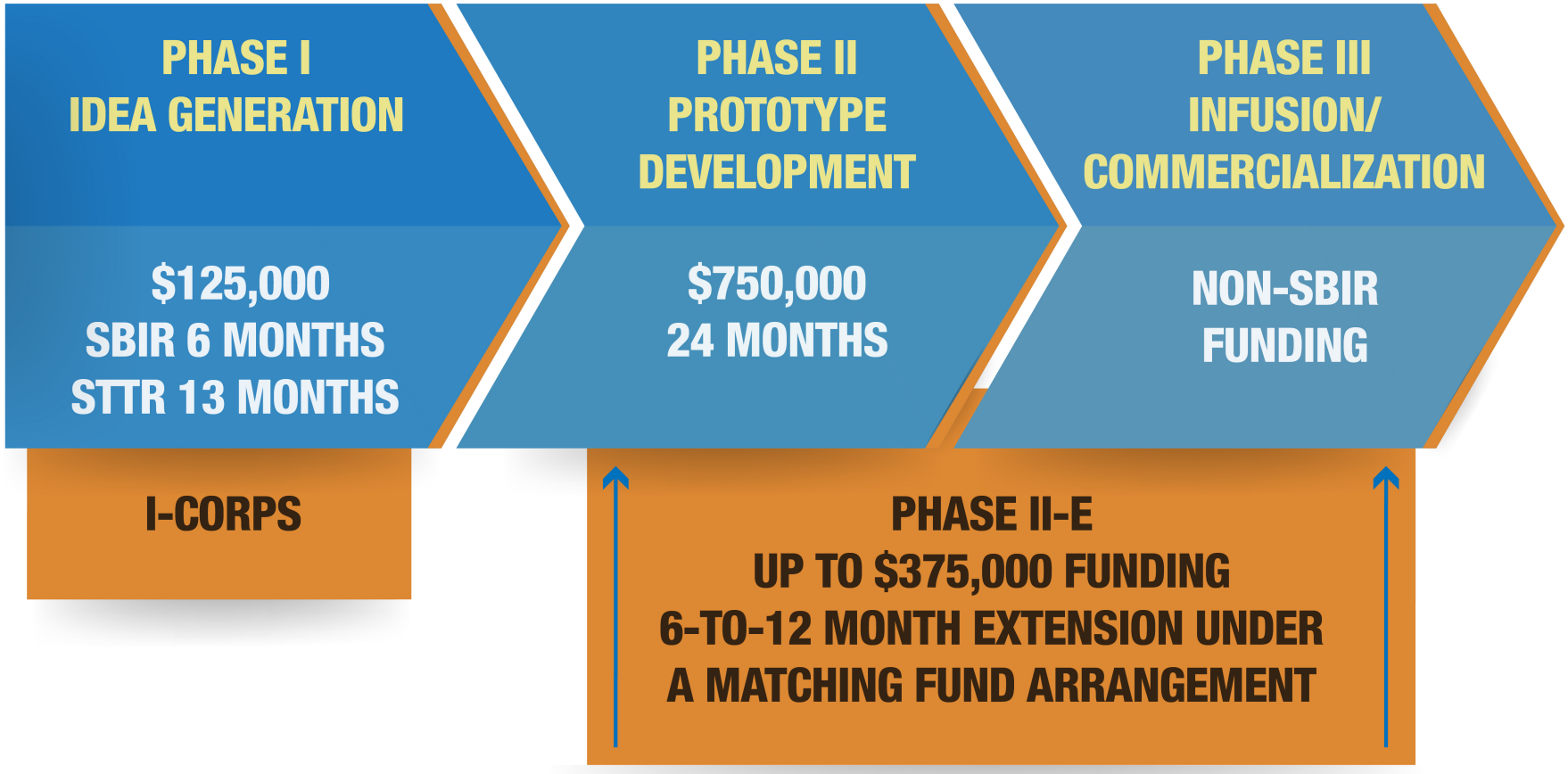
GRANTING AGENCIES

- Investigator initiates
- Less-specified topics
- Assistance mechanism
- More flexibility

HHS/NIH, NSF, ED, USDA, DOE

SBIR/STTR Program Structure

NASA SBIR/STTR PROCESS



Go to sbir.nasa.gov/guide for details

Intellectual Property

Patent Rights

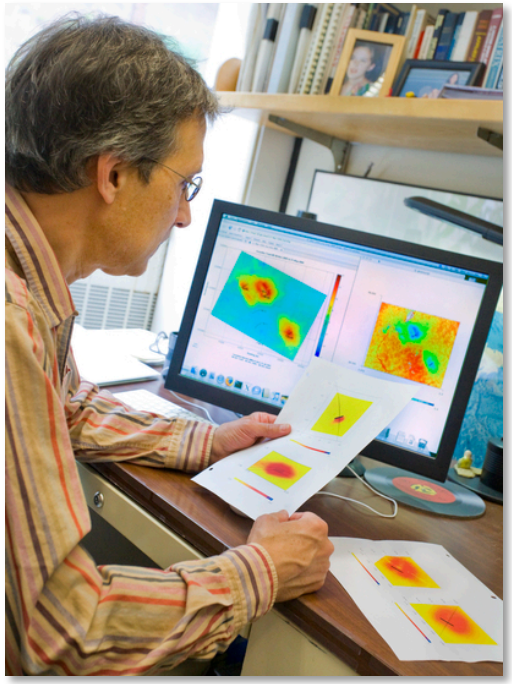
- Small business concerns normally retain the principal worldwide patent rights to any invention developed with Government support

Government Use

- The Federal Government receives a royalty-free license for Federal Government use

U.S. Patent and Trade Office
http://www.uspto.gov/

Data Protection



Protection Period

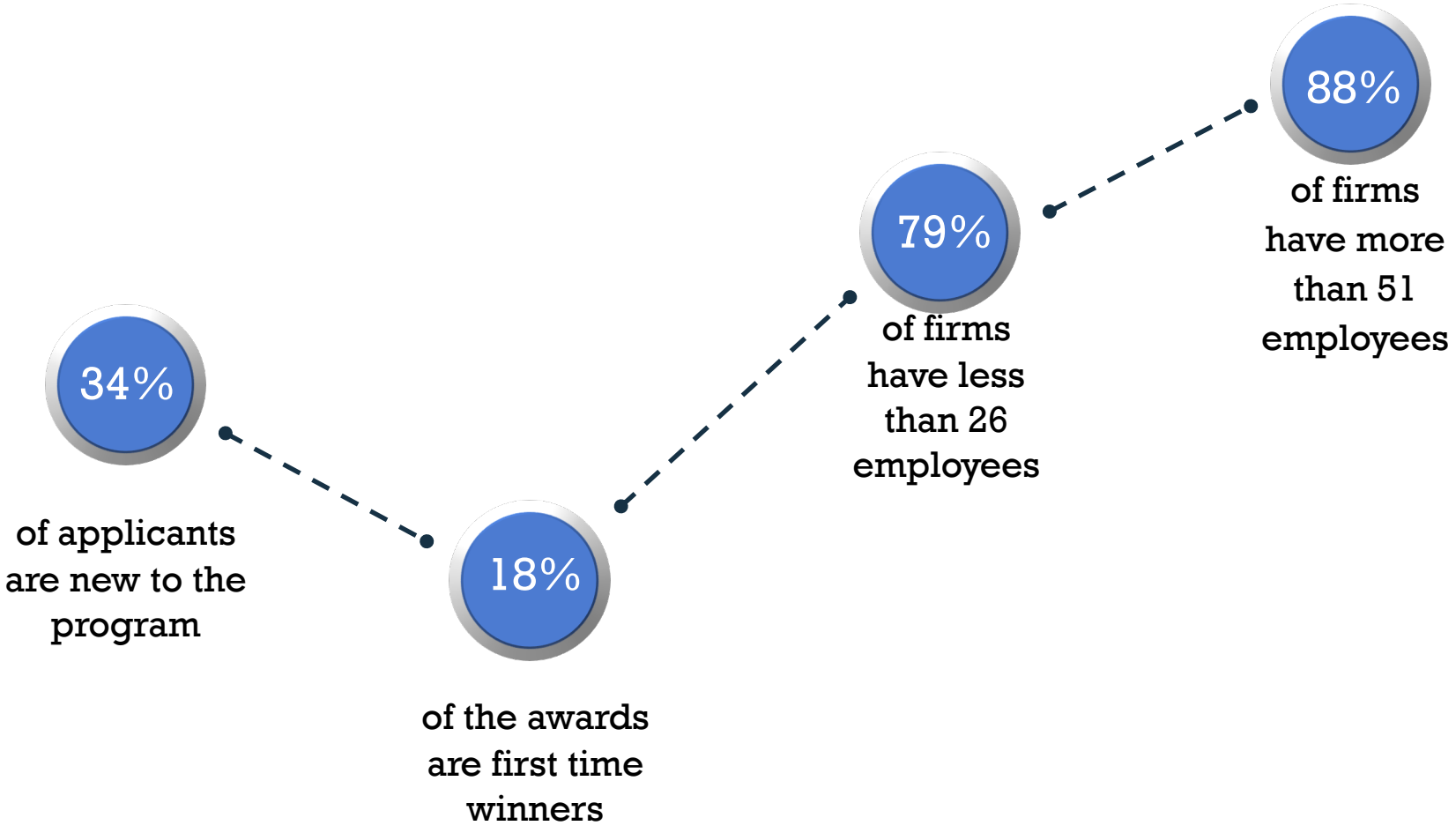
- Data generated from your R/R&D is protected from public disclosure for a minimum of 4 years (civilian agencies) or 5 years (DOD) after the conclusion of your award (Phase I, Phase II, or federally funded Phase III)

Government Use

- The Government retains a royalty-free license for Government use of any technical data delivered under an SBIR award, whether patented or not

Working with Small Businesses

FY17 Phase I SBIR/STTR Awards Data Points



Program 2018 Initiatives

I-Corps

In partnership with the National Science Foundation (NSF), NASA is offering the I-Corps program to educate selected teams on how to translate technologies from the laboratory into the marketplace.

http://sbir.nasa.gov/content/I-Corps

Mentor-Protégé Program

The NASA Mentor-Protégé Program encourages NASA prime contractors to assist eligible protégés to:

- Enhance their capabilities to perform on NASA contracts and subcontracts,
- Foster the establishment of long-term business relationships between these entities and NASA prime contractors, and
- Increase the overall number of these entities that receive NASA contract and subcontract awards.

For more information on the Mentor-Protégé Program visit: http://www.osbp.nasa.gov/mpp/index.html

Learning about NASA's Needs

Focus Areas

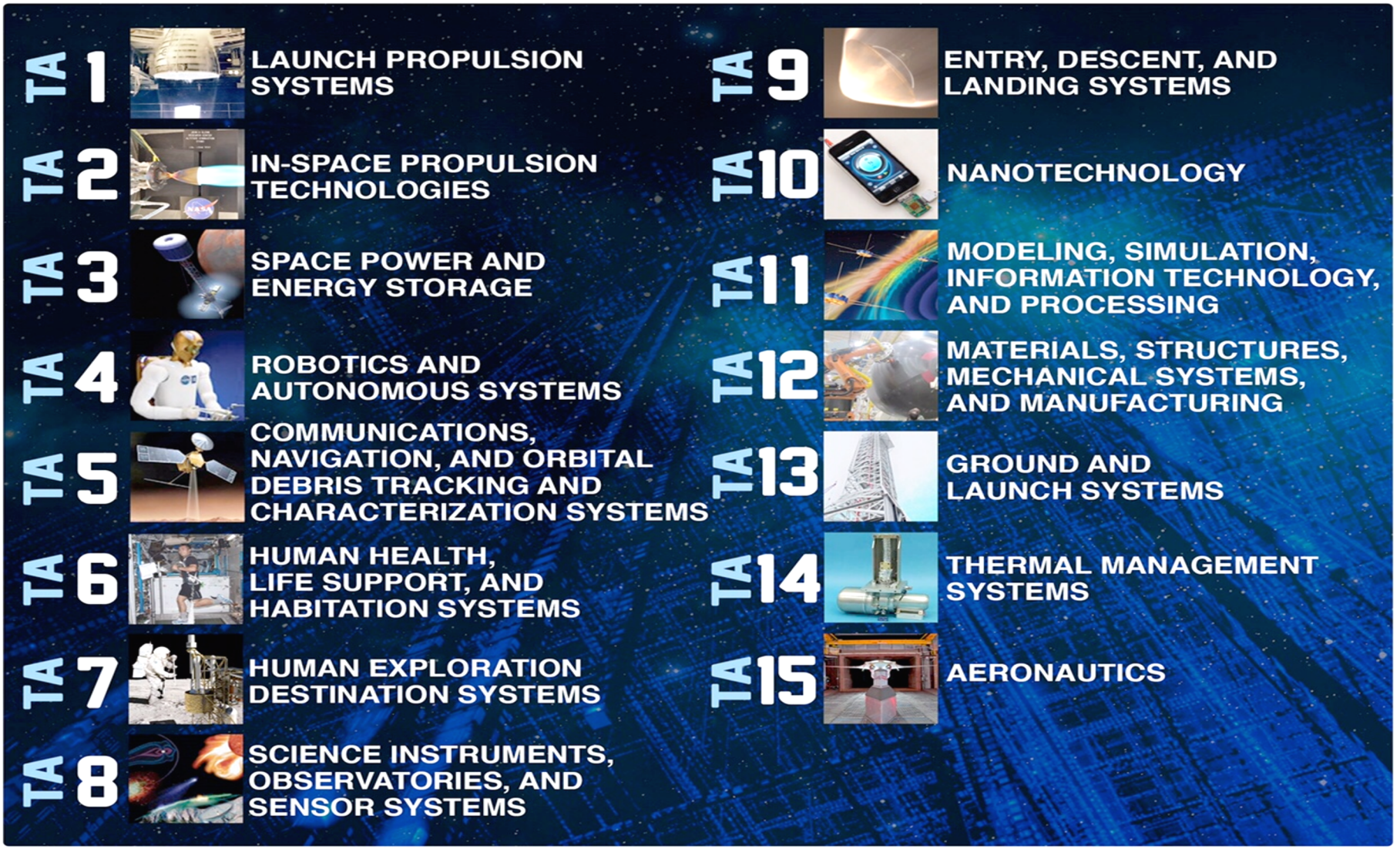
NASA's research subtopics are organized by "Focus Areas" that group interests and related technologies.

- **Identify** the Area(s) closest to your innovation/idea
- **Go** to our website to research
- **Prepare to write** a proposal tailored to NASA's needs

https://sbir.nasa.gov/solicitations

2018 Focus Areas	
1. In-Space Propulsion Technologies	12. Entry, Descent and Landing Systems
2. Power and Energy Storage	13. Information Technologies for Science Data
3. Autonomous Systems for Space Exploration	14. In-Space and Advanced Manufacturing
4. Robotic Systems for Space Exploration	15. Lightweight Materials, Structures, Assembly, and Construction
5. Communications and Navigation	16. Ground and Launch Processing
6. Life Support and Habitation Systems	17. Thermal Management Systems
7. Human Research and Health Maintenance	18. Air Vehicle Technology
8. In-Situ Resource Utilization	19. Integrated Flight Systems
9. Sensors, Detectors and Instruments	20. Airspace Operations and Safety
10. Advanced Telescope Technologies	21. Small Spacecraft Technologies
11. Spacecraft and Platform Systems	22. ISS Utilization and Microgravity Research

NASA's Technology Roadmaps



https://www.nasa.gov/offices/oct/home/roadmaps/index.html

Checklist before Submitting Application

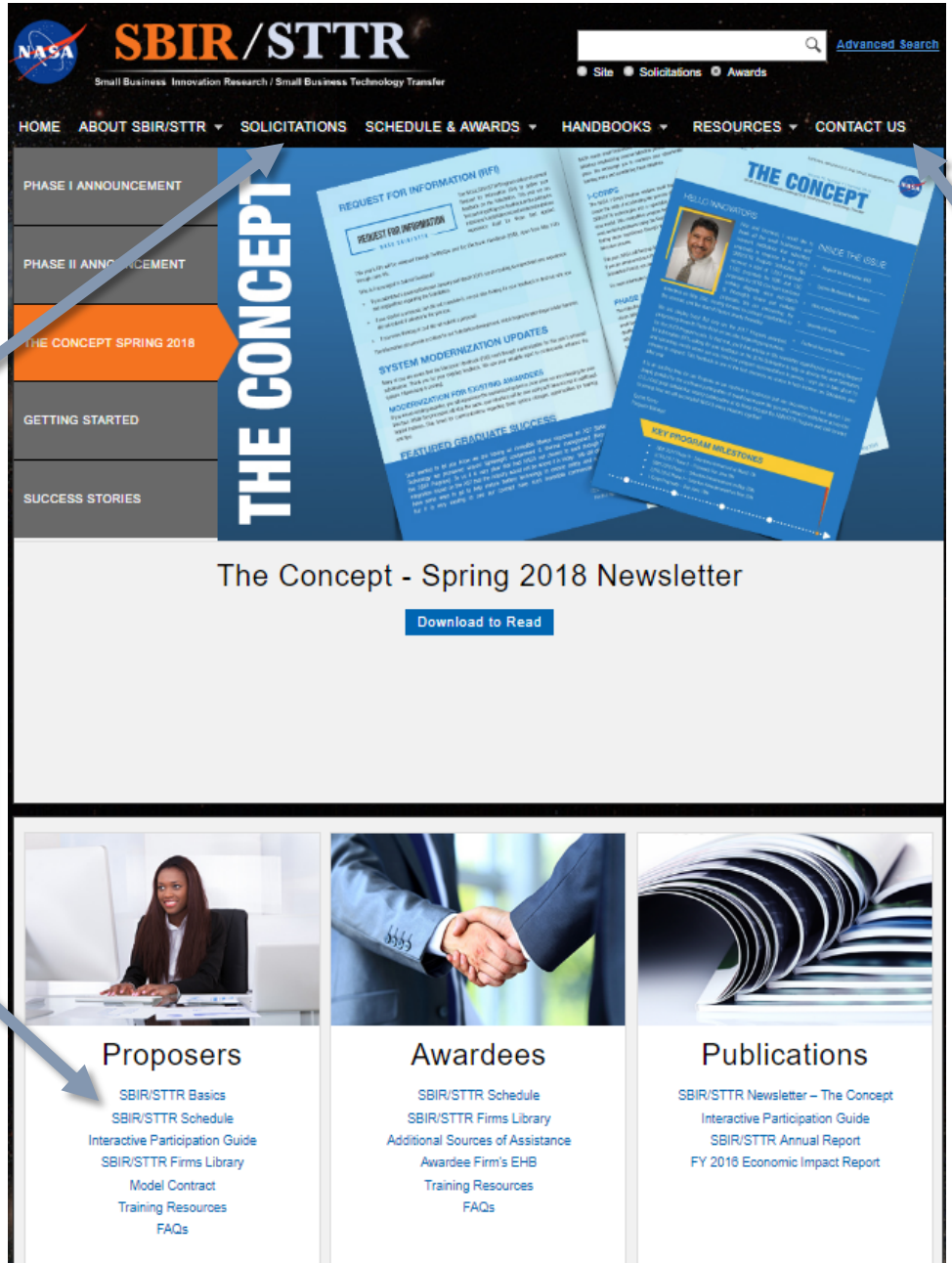
- Submit proposal prior to the deadline
- Perform the “Endorse Proposal” step, which is the final step in the submissions process
- Make sure you meet the format requirements (margin and font size, page limitation)
- Have the RI register correctly (STTR Requirement)
  - For STTR proposals the RI needs to endorse the Research Agreement prior to your proposal being complete and submitted
    - RI will need to create an account in the Proposal Submission EHB
    - register under your firm using your EIN, State, and PIN so they are attached to your proposal correctly
    - choose the RI option at the bottom of the page when entering their name, email, phone, etc.

NASA SBIR/STTR Website www.sbir.nasa.gov

The NASA SBIR/STTR website is located at www.sbir.nasa.gov

Research NASA's Needs
Annual Solicitations including past years

Looking to Join the Program?
- Program Basics
- Forms Library
- Model Contract
- In-depth Training Resources and FAQs



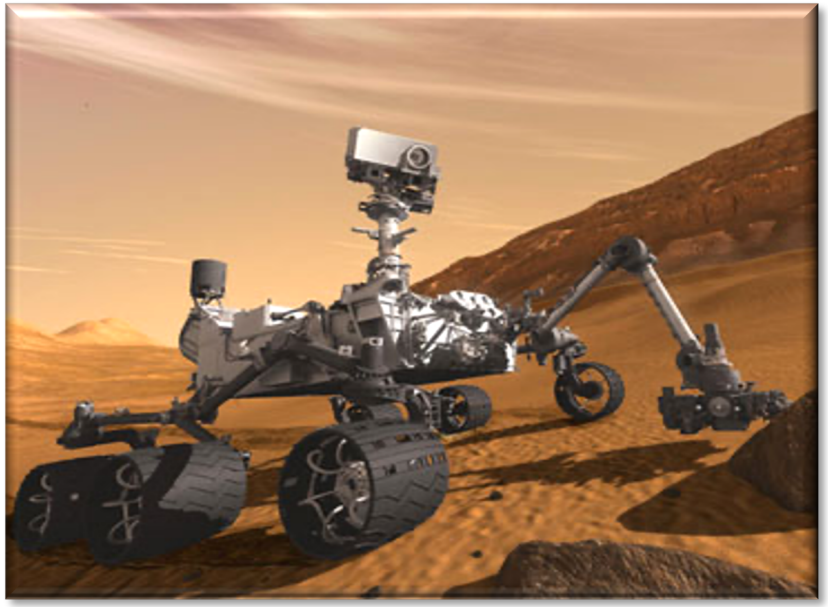
Contact the Program
SBIR/STTR Helpdesk and Program Points of Contact

JPL SBIR/STTR Program in Space – Curiosity

Grammatech - Software for eliminating defects in mission-critical and embedded software applications directing rover operations

Starsys Research - Planetary gearboxes for the articulated robotic arm and the descent braking mechanism for controlling rate of descent to planetary surface

Creare - A space-qualified vacuum pump for the Sample Analysis at Mars (SAM) instrument package



ABOUT THE MISSION

The Mars Science Laboratory mission's Curiosity rover, the most technologically advanced rover ever built, landed in Mars' Gale Crater the evening of Aug. 5, 2012 PDT (morning of Aug. 6 EDT) using a series of complicated landing maneuvers never before attempted. The specialized landing sequence, which employed a giant parachute, a jet-controlled descent vehicle and a bungee-like apparatus called a "sky crane," was devised because tested landing techniques used during previous rover missions could not safely accommodate the much larger and heavier rover.

Curiosity's mission is to determine whether the Red Planet ever was, or is, habitable to microbial life. The rover, which is about the size of a MINI Cooper, is equipped with 17 cameras and a robotic arm containing a suite of specialized laboratory-like tools and instruments.

Yardney Technical Products – Lithium ion batteries that enable the power system to meet peak power demands or rover activities

Honeybee Robotics – Dust removal tool used to remove the dust layer from rock surfaces and to clean the rover's observation tray and designed the sample manipulation system for the Sample Analysis at Mars (SAM) instrument package

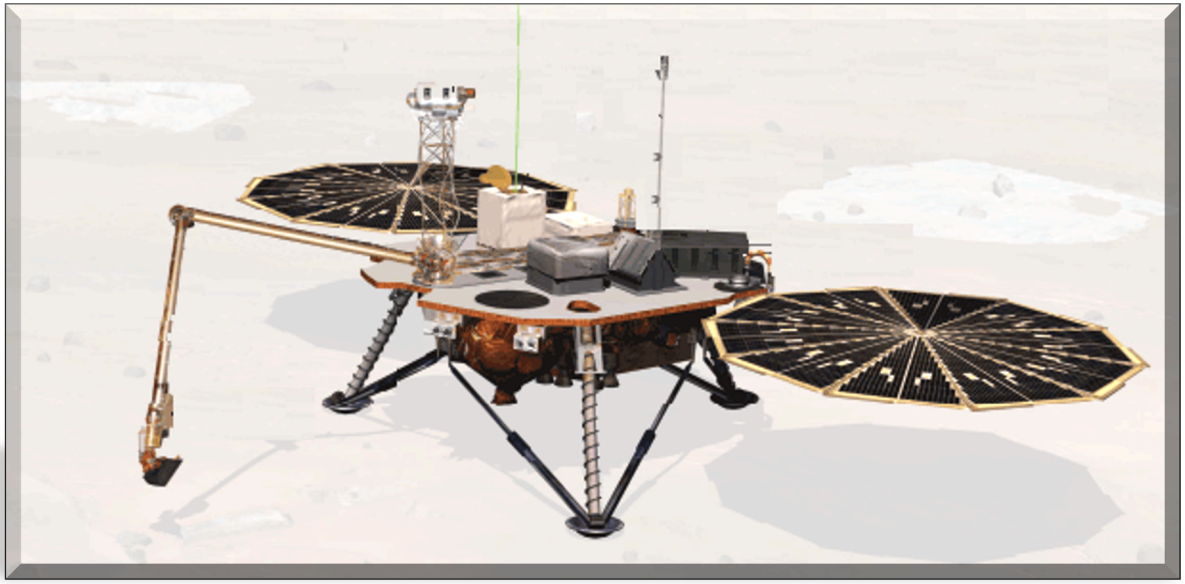
inXitu– Features of their automated sample handling system are implemented in the Chemistry and Mineralogy experiment (CheMin) instrument

JPL SBIR/STTR Program in Space - Phoenix

Icy Soil Acquisition Device supplied by **Honey Robotics, Inc.**

Lithium ion batteries supplied by **Yardney Technical Products, Inc**

SpaceDev contributed wet chemistry elements of the Microscopy Electrochemistry and Conductivity Analyzer (MECA)



ABOUT THE MISSION

Phoenix was a lander sent to the surface of Mars to search for evidence of past or present microbial life. Using a robotic arm, it could dig up to half a meter into the Red Planet to collect samples and return them to onboard instruments for analysis. Besides verifying the existence of water-ice in the Martian subsurface, Phoenix discovered traces of the chemical perchlorate, a possible energy source for microbes and a potentially valuable future resource for human explorers.

As planned, the Phoenix lander ended communications in November 2008, about six months after landing, when its solar panels ceased operating in the dark Martian winter.

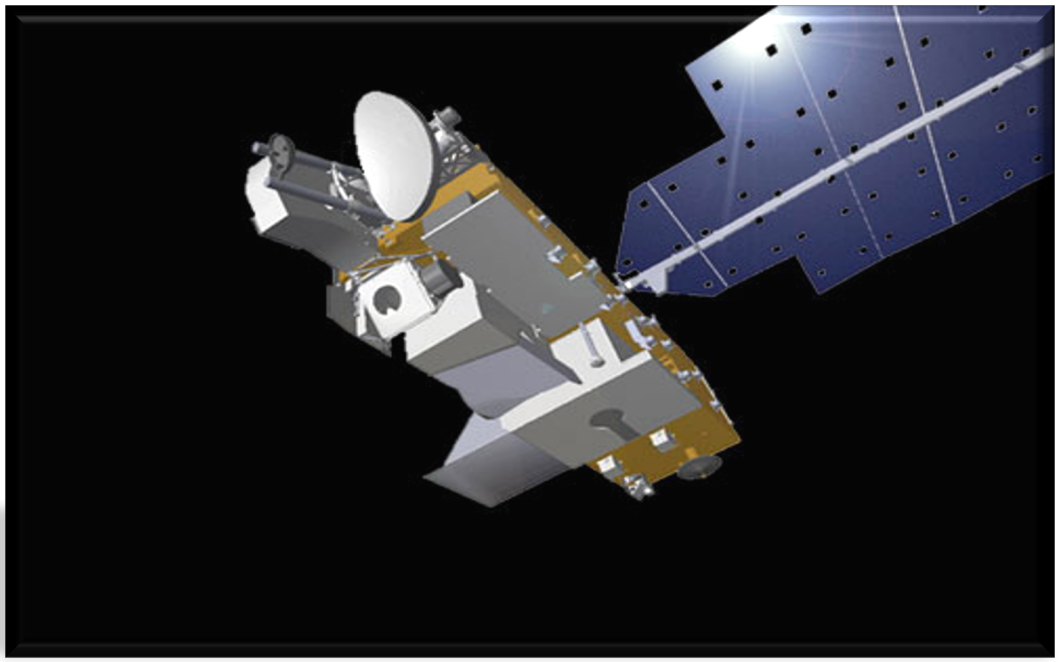
JPL SBIR/STTR Program in Space – Aura Mission

Composite Optics provided light weight, large aperture reflector of graphite reinforced composite material with high surface accuracy for the Microwave Limb Sounder (MLS)

DeMaria Electrooptics Under a $6.5 million contract with JPL, the company provided a terahertz radiometer for the MLS

Spaceborne supplied two correlator chips that make the analog to digital signal conversion and clean up the signal received by MLS

Lightwave Electronics provided two diode pumped solid state lasers for Tropospheric Emission Spectrometer (TES)



Seaspace Corporation
Developed low cost system that makes it possible for universities and other purchasers to receive the data transmissions from Aura

ABOUT THE MISSION

Aura (formerly EOS/Chem-1) is the chemistry mission of NASA with the overall objective to study the chemistry and dynamics of Earth's atmosphere from the ground through the mesosphere. The mission monitors the complex interactions of atmospheric constituents from both natural and man-made sources, such as biomass burning that effect the creation and depletion of ozone. The Aura mission provides global surveys of several atmospheric constituents which can be classified into anthropogenic sources (CFC types), radicals (e.g., ClO, NO, OH), reservoirs (e.g., HNO, HCl), and tracers (e.g., N2O, CO2, H2O). Temperature, geopotential heights, and aerosol fields will also be mapped.

JPL SBIR/STTR Points of Contact

- For complete program overview and current information, go to http://sbir.nasa.gov/

- JPL Contacts
  - Science Mission Directorate Liaison
    - Dr. Carol Lewis
    - (818) 354 3767
    - Carol.R.Lewis@jpl.nasa.gov
  - JPL Center Technology Transfer Lead
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- Visit JPL's SBIR page at http://sbir.jpl.nasa.gov/

Contact us and let's innovate together

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NASA Help Desk

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