



Small Business Innovation Research Small Business Technology TTransfer

Gynelle Steele | SBIR/STTR Overview - Reaching Higher: Aerospace Business Matchmaker | 7/17/18

PHASE II SUCCESS

\$365,000 additional investment for business development of the sUAS.

SNAPSHOT

Black Swift Technologies has designed a low cost sUAS that provides measurements of volumetric soil moisture content over agricultural-plot sized areas to support water management, agriculture, and fire, flood and drought hazard monitoring.

Soil Moisture sUAS

- Black Swift Technologies LLC, Boulder, Colorado

Water is critical to sustaining life, especially when it comes to the world's food supply. Pinpointing which crops on multi-acre farms need water goes a long way to conserving this precious resource. Colorado-based Black Swift Technologies (BST) created a small unmanned aircraft system (sUAS) to help NASA get a clearer picture of soil moisture through the Small Business Innovation Research (SBIR) program. Soil moisture is defined in terms of volume of water per unit volume of soil. Using BST's sUAS, NASA scientists can gather ground truth measurements for a clearer observation by getting closer to the source. This can help rule out misleading results generated by satellite imagery.



PHASE II SUCCESS

Total SBIR awards of \$885,000

SNAPSHOT

An innovative water recycling process that leverages novel microorganisms to provide cost-effective, closed-loop water purification on the International Space Station (ISS) and on Earth.

Water Recycling System for Space Exploration

- Pancopia, Hampton, VA

Water is as critical for survival in outer space as it is on Earth. In fact, 92% of the cost of sustaining human life on the ISS is attributed to making safe drinking water available. As a result, astronauts must make the most of water supplies by recycling this precious resource, which can save millions of dollars.

Pancopia developed a new biological water recycling system that can remove high levels of organic carbon and nitrogen, the two major pollutants in wastewater, at a lower cost than systems currently in use and at a faster rate.



PHASE III SUCCESS

IRIS AO products derived from SBIR funding are available for world-wide distribution by Edmund Optics - approximately \$2 million revenue generated annually from the technology developed from NASA SBIR. NASA's SBIR program invested \$875,000.

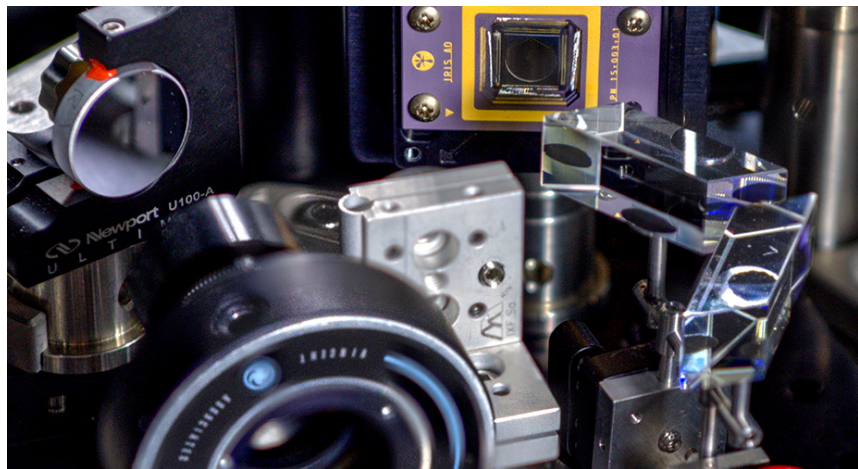
SNAPSHOT

Since the first exoplanet discovery in 1995, NASA has dedicated resources to develop deformable mirrors for powerful telescopes to determine if there are signs of life beyond Earth on planets outside our solar system.

Special Mirrors Help NASA Detect Planets

- IRIS AO, Inc., Berkley, CA

Starlight can lower the contrast in images sent back to Earth from a telescope traveling in space, making it harder to detect planets light years away. IRIS AO, Inc. helped NASA to develop deformable mirror (DM) technology that can filter out direct light from stars that limit the visibility of exoplanets. The technology is a key component of starlight blocking instruments on telescopes. The DM is used to correct optical aberrations that otherwise reduce the resolution of an image. The data collected by the telescope using the Iris AO DM can be used to determine if the target investigated in space is an exoplanet based on its orbit, and if the exoplanet has atmosphere using color spectrum imaging analysis. Iris AO has further developed DM technology for new imaging applications in critical research. For example, the National Institutes of Health and the Air Force are using Iris AO DMs for retinal imaging.



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.

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

MISSION

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

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

The SBIR / STTR Programs



Small Business Innovation Research (SBIR)

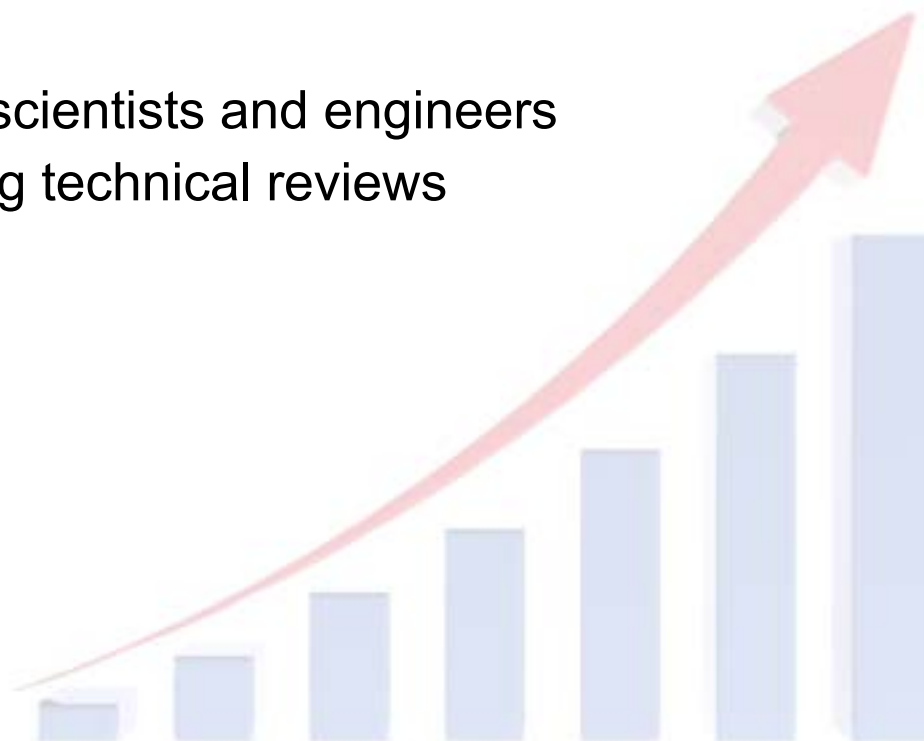
- A set-aside program for small business to engage in Federal R&D – with potential for commercialization
- For FY17, 3.2% of Federal agencies Extramural R&D budgets greater than \$100M per year

Small Business Technology Transfer (STTR)

- A sister set-aside program to facilitate cooperative R&D between small business concerns and U.S. research institutions – with potential for commercialization
- For FY17, 0.4% of the extramural research budget for all agencies with a budget greater than \$1B per year

NASA Program Background

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



Participating Federal Agencies

SBIR + STTR Programs



Department of
Defense (DoD)



Department of
Health and
Human Services
(HHS)



Department of
Energy (DoE)



National Aeronautics
and Space
Administration
(NASA)



National Science
Foundation (NSF)

SBIR Program Only



Department of
Agriculture
(USDA)



Department of
Education (DoEd)



Department of
Transportation (DoT)



Environmental
Protection
Agency (EPA)



Department of
Homeland Security
(DHS)



Department of
Commerce
(DoC)

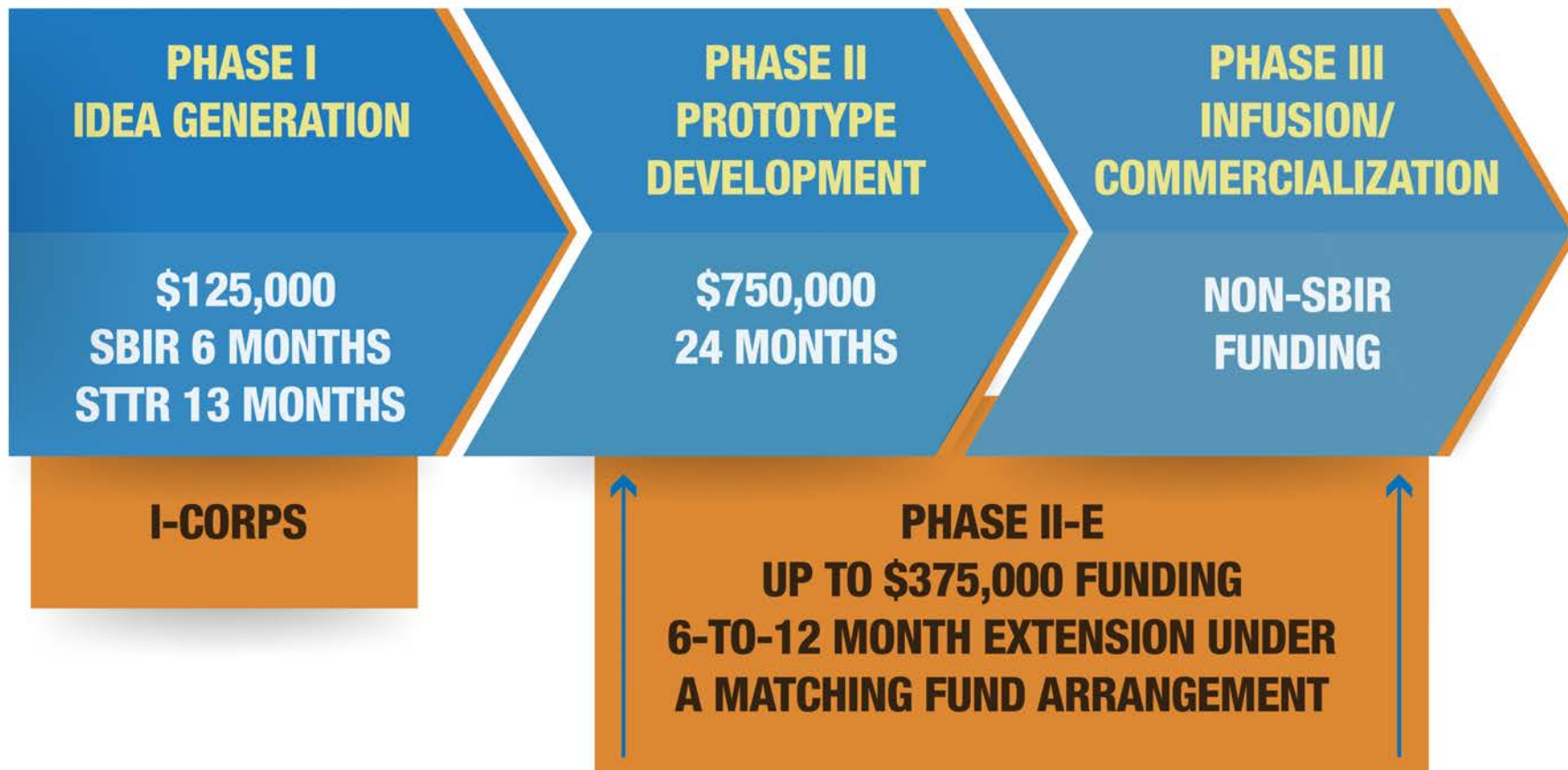
STTR Eligibility Requirements

- Must be located in the United States and at least 51% owned and controlled by one or more individuals who are citizens of, or permanent resident aliens in, the United States
- Formal Cooperative R&D effort with a U.S. Research Institution
- Minimum 40% by small business, 30% by U.S. Research Institution (still have 30% that can be shared between the two parties or used for subcontracting, etc.)
- Small business is Prime, Principal Investigator can be from Small Business Concern or Research Institution
- The U.S. research institution (RI) must be an accredited college/university, a federal research and development center, or other non-profit research organization
- Other SBIR requirements generally also apply



SBIR/STTR Program Structure

NASA SBIR/STTR PROCESS



Go to sbir.nasa.gov/guide for details

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>



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 SBIR/STTR Website <https://sbir.nasa.gov>

The NASA SBIR/STTR website is located at <https://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

The screenshot shows the NASA SBIR/STTR website homepage. At the top is the NASA logo and the text "SBIR/STTR Small Business Innovation Research / Small Business Technology Transfer". Below this is a navigation bar with links: HOME, ABOUT SBIR/STTR, SOLICITATIONS, SCHEDULE & AWARDS, HANDBOOKS, MULTIMEDIA, and CONTACT US. A search bar is also present. The main banner features a large image of a rocket engine component with the text "TETHERS UNLIMITED, INC." and "TETHERS UNLIMITED, INC." below it. To the left of the banner is a sidebar with links: 2017 INDUSTRY DAY, SELECTION AND AWARD, NATIONAL CONFERENCE, SUCCESS STORIES, and TECHNOLOGIES. Below the banner is a "Success Stories" section titled "CubeSat Thrusters Powered by Green Propellant" with a "Read More" button. At the bottom are three columns: "Proposers" (with links to SBIR/STTR Basics, SBIR/STTR Schedule, Participation Guide, SBIR/STTR Firms Library, and Model Contract), "Awardees" (with links to SBIR/STTR Schedule, SBIR/STTR Firms Library, Additional Sources of Assistance, Awardee Firm's (IR), and Training Resources), and "Demographics Data" (with links to State-based Statistics, Award Search, and FY 2012 Economic Impact Report).

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

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>



Contact us and let's innovate together

Website: **<https://sbir.nasa.gov>**

NASA Help Desk: **301.937.0888**