National Aeronautics and Space Administration

NASA and Small Business: Partnering Today to Create the Industry of Tomorrow

Jason L. Kessler | NASA SBIR/STTR Program Executive | April 14, 2021

NASA SBIR/STTR Program

nasa.sbir.gov

AGENDA

- Earth Observation Renaissance
- Overview of the NASA SBIR/STTR Program
- NASA's Place in the Commercial Space Industry
- Success Stories
- How Do I Get Involved?

Earth Observation Renaissance

Earth Observation Renaissance: Then and Now

1999: LIMITED OPTIONS

- Space Shuttle Cost | $1.5B/launch or $55k/kg
- Ikonos | Weighed 800 kg with 3.2m multispectral resolution
- NASA DAACs

NOW: UNBOUNDED POTENTIAL

- Falcon 9 Cost | $62M/launch or $2,700/kg
- Rocket Lab | Dedicated smallsat launch capability
- Astra | Smallsat market competition & SBIR company
- Dove | Weighs under 5kg with 3m multispectral resolution
- Cloud Services | Co-located data storage and processing

Overview of the NASA SBIR/STTR Program

MISSION

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

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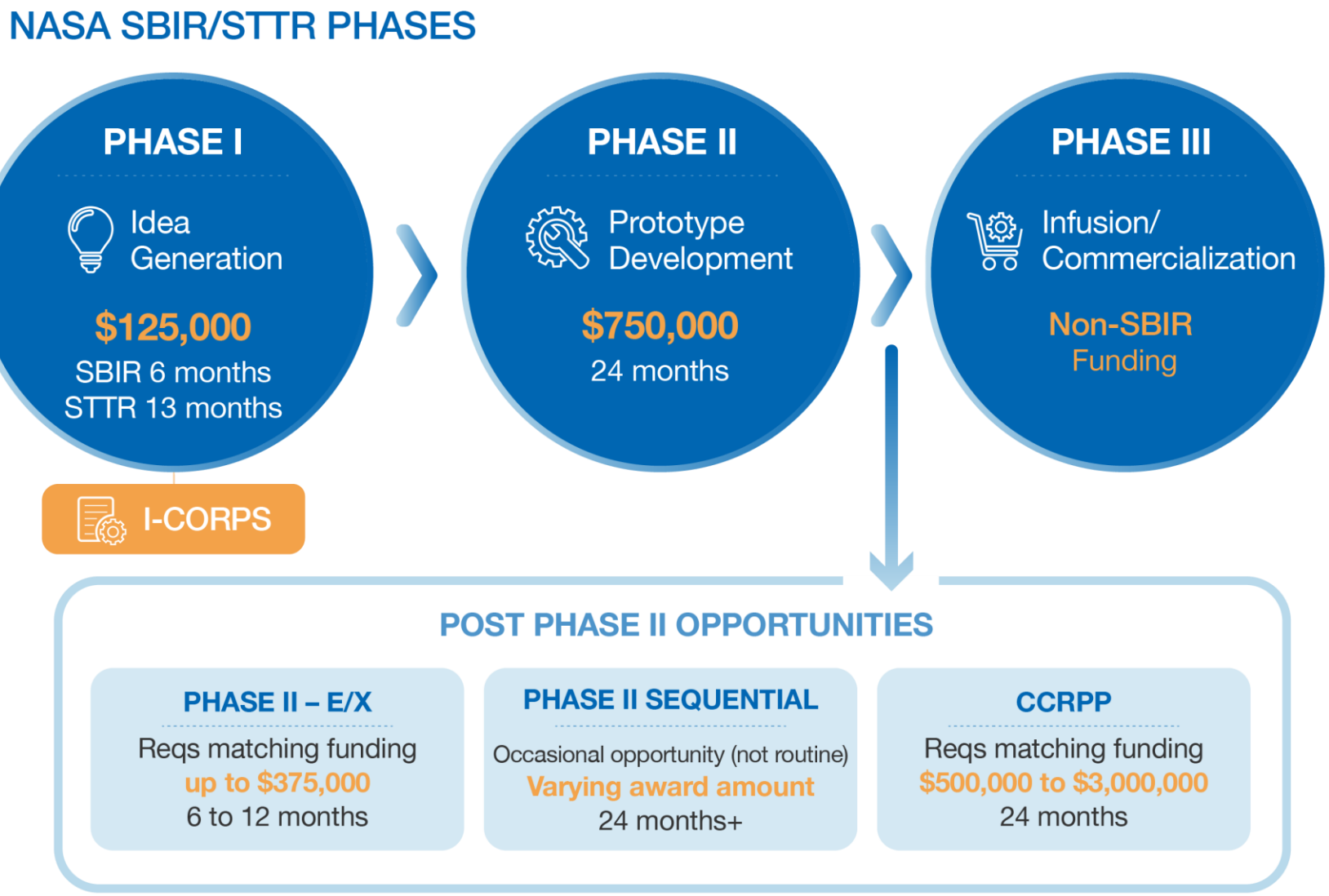
VISION

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

NASA SBIR/STTR Program | Opportunities



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NASA’s Place in the Commercial Space Industry

What word describes NASA's place in the industry?

"Stimulate"

- Providing Early-Stage Funding…
  - Phase I Concepts
    - High Risk
    - High Potential
  - **Program Goal:** Provide pre-venture capital to promising concepts

- …To Expand What's Possible
  - Post-Phase II/Phase III Products
    - Low Risk
    - High Potential
  - **Program Goal:** Support innovative products with strong customer and investor backing

NASA SBIR/STTR Program | Impact

As a program under STMD, the NASA SBIR/STTR program funds the research, development, and demonstration of innovative technologies that fulfill NASA needs.

NASA's SBIR/STTR program has **awarded more than $3.75 billion** to research-intensive American small businesses

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

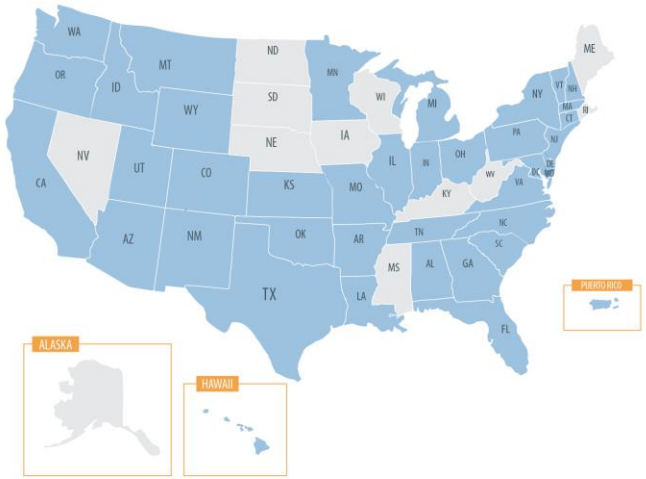
2021 Phase I Awards

National Aeronautics and Space Administration

NASA SBIR/STTR PROGRAM
2021 Phase I Awards by the Numbers

NASA Provides $45 Million Boost to U.S. Small Businesses

289 small businesses and **47** research institutions across **38** states, D.C., and Puerto Rico selected to receive funding that supports technology development for NASA missions



19% of the research institutions partnering with small businesses for STTR are classified as Minority Serving Institutions (MSIs)

91
companies selected for their first SBIR/STTR award

198
companies with previous awards selected

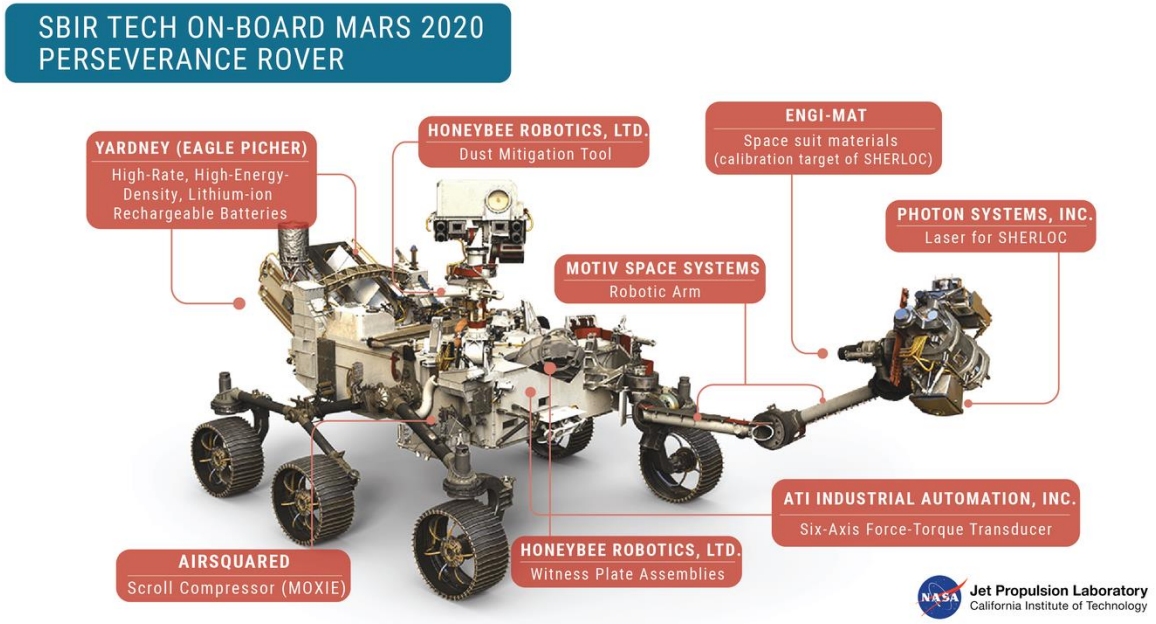
27% of the companies are from underrepresented groups, including minority- and women-owned businesses

365 proposals
selected for Phase I funding

308 SBIR & 57 STTR
proposals selected

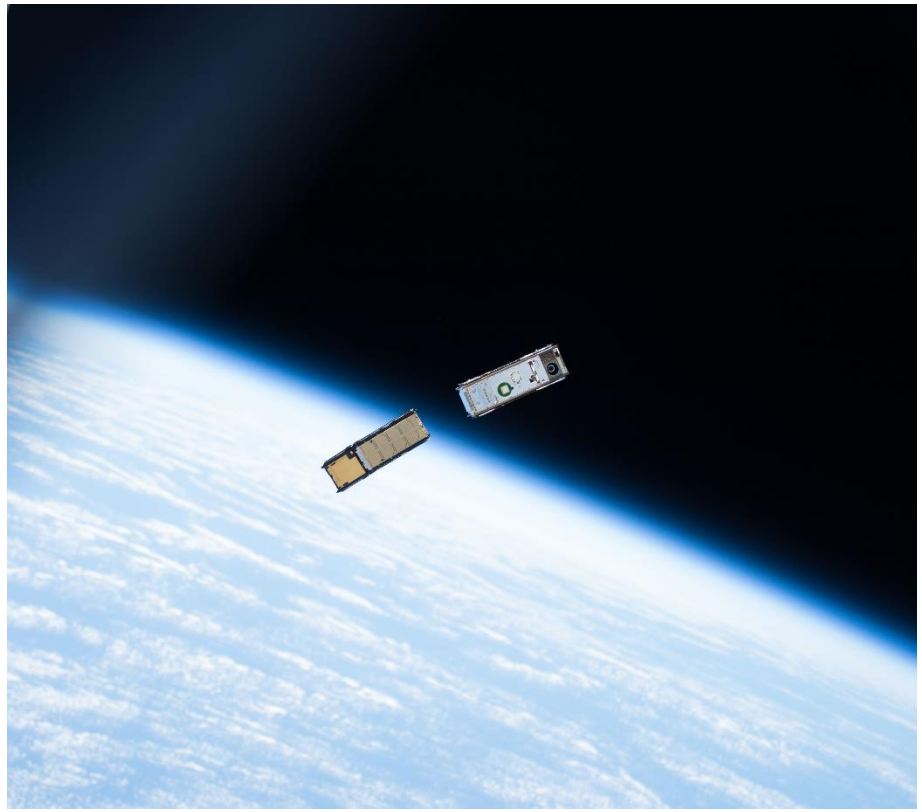
Our Program Participants Go Far

- Mars Perseverance Rover
  - Landed on Mars February 18th, kicking off a new chapter in NASA's exploration of the Red Planet
  - Featured technologies from **seven NASA SBIR/STTR award recipients**
  - These small businesses are based in:
    - Air Squared, Inc. | Colorado
    - ATI Industrial Automation, Inc. | North Carolina
    - Engi-Mat | Kentucky
    - Honeybee Robotics, Ltd. | New York
    - Motiv Space Systems, Inc. | California
    - Photon Systems, Inc. | California
    - Yardney Technical Products, Inc. | Rhode Island



Success Stories

Success Story | Virginia Diodes, Inc.



[Read more about VDI's success on nasa.sbir.gov]

CubeSat Measures World's First Ice Cloud Map to Support Climate Research

PHASE III SUCCESS:

VDI's commercial sales of terahertz components and systems directly attributed to NASA-funded SBIR research are in excess of $45M.

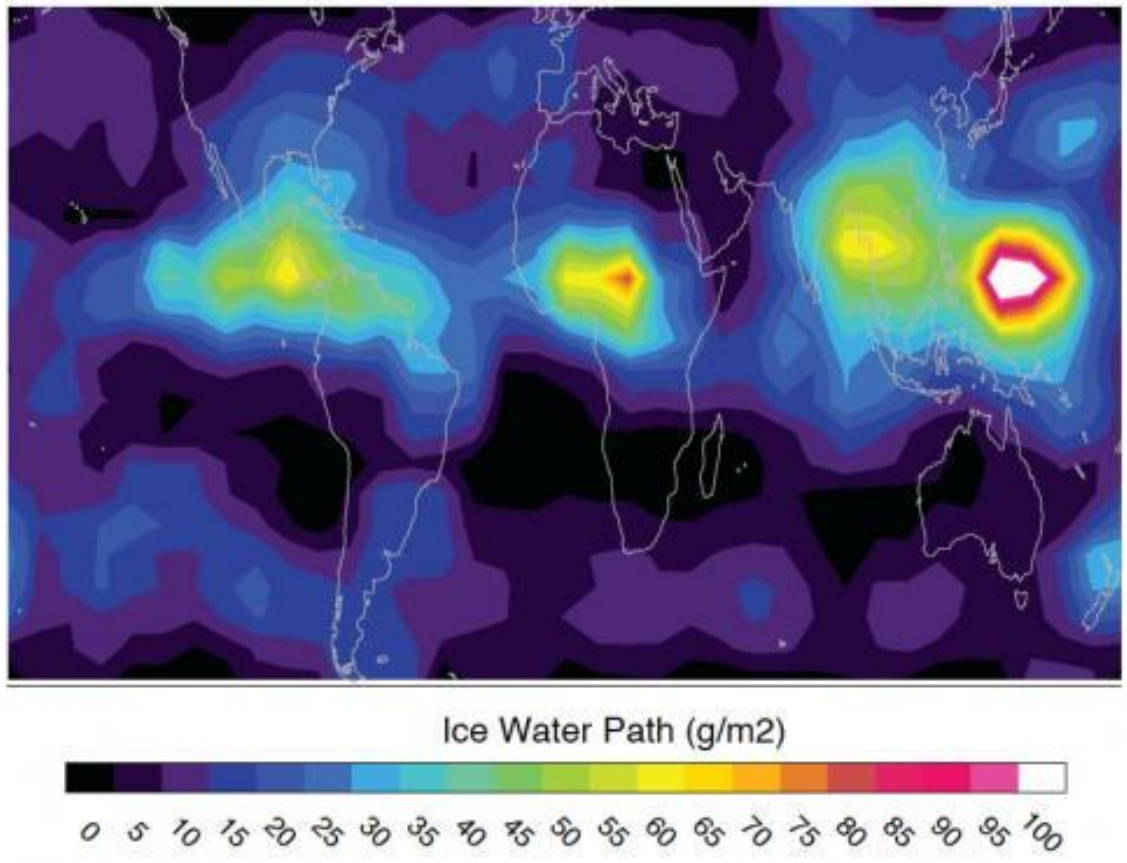
SNAPSHOT:

Virginia Diodes, Inc. received NASA SBIR Awards to fund research and development for a lesser developed region of the electromagnetic spectrum—terahertz waves. Their work led to funding from NASA ESTO, and the resulting CubeSat (named IceCube) captured the world's first ice cloud map, which will contribute to our understanding of Earth's climate.

Success Story | Virginia Diodes, Inc.

The SBIRs allow us to really focus on technology and push us to work hard on research and new ideas. It's money to research, which is really how we're able to come up with new solutions.

– **Dr. Thomas Crowe**
VDI CEO and President



Global cloud ice map generated by IceCube in 2017

Success Story | Made In Space

[Read more about Made In Space's success on sbir.nasa.gov]

Bringing Additive Manufacturing to Space

POST-AWARD SUCCESS:

Made In Space received more than $4M in post-Phase II and follow-on funds from NASA and the Air Force. The company also received a $73.7M NASA contract for OSAM-2 and was acquired in 2020 by Redwire.

SNAPSHOT:

Made In Space received its first NASA SBIR/STTR award in 2011 for an ISS Additive Manufacturing Facility for On-Demand Fabrication in Space; in 2015, the company transitioned its SBIR technology to launch the first Additive Manufacturing Facility on the ISS. Made in Space has since received a $73.7M contract from NASA to develop and demonstrate On-Orbit Servicing, Manufacturing and Assembly 2 (OSAM-2), and in 2020 was acquired by Redwire, a developer of next generation space systems and infrastructure.

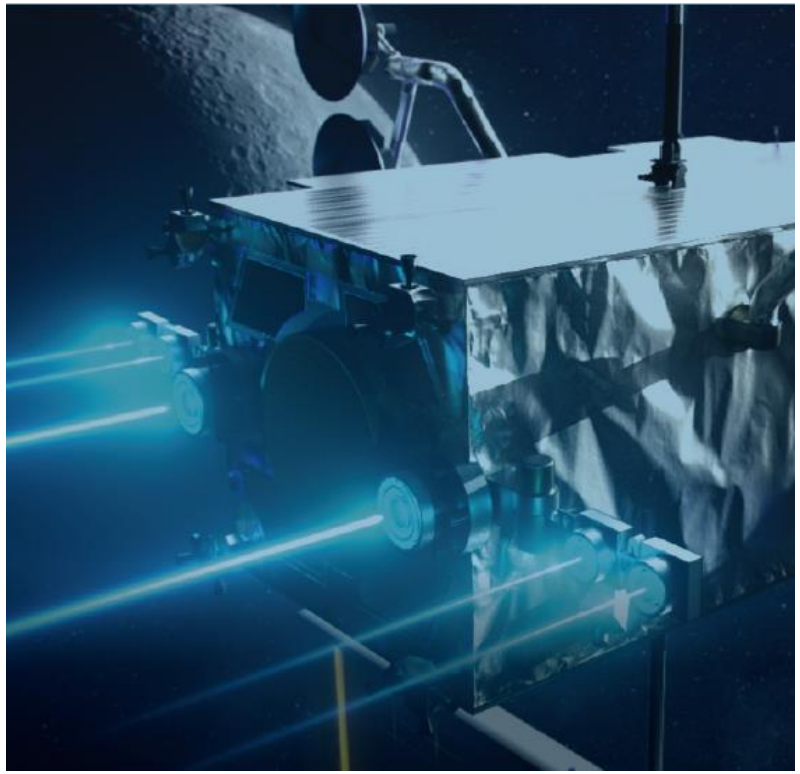
Success Story | Made In Space

We really went from bootstrapping and relying on internal investments, to somebody having faith in us. The SBIR program believed in us and thought we could pull this off – and we haven't let them down yet.

– Mike Snyder
Made In Space Chief Engineer

Made In Space's 3D printer on the International Space Station
Photo courtesy of NASA

Success Story | Gateway



[Read more about this NASA SBIR/STTR success story on nasa.sbir.gov]

Power and Propulsion for Gateway

NASA SBIR/STTR Firms:

Two NASA SBIR/STTR awardees—Deployable Space Systems and Busek Company, Inc.—were selected on a team to support NASA's Gateway with technology developed in part with SBIR/STTR awards.

SNAPSHOT:

NASA’s Gateway in lunar orbit will play a critical role in the Artemis program, which aims to land the first woman and the next man on the Moon by 2024. The development of the Power and Propulsion Element for Gateway is being led by Maxar Technologies with contributions from two NASA SBIR/STTR awardees—Deployable Space Systems (now a Redwire subsidiary) and Busek Company, Inc.—both of which initially developed their Gateway contributions with support from the NASA SBIR/STTR program.

Success Story | Gateway

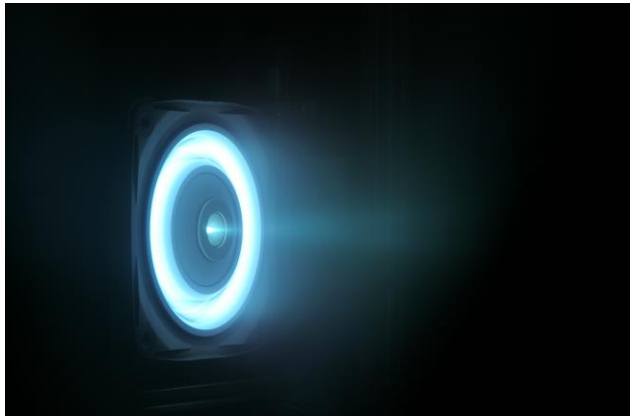
The NASA SBIR/STTR program was essential to DSS being able to do what we did. It gave us exposure in the industry and funding to be able to develop and test this technology.

– Steve White
Deployable Space Systems Vice President

The heights we strive to reach would not be possible without the SBIR program, the ongoing support from NASA's Science Technology Mission Directorate, and our collaboration with NASA's Glenn Research Center and NASA's Jet Propulsion Laboratory.

– Vlad Hruby
Busek President

DSS is contributing its Roll Out Solar Array technology to supply power to Gateway



Busek develops Hall thrusters that will provide Gateway with high-efficiency propulsive capability

From NASA to Nasdaq

Ventions, LLC

- 2005 | Founded
- 2008 | Received first NASA SBIR/STTR award
- 2008 – 2016 | Received 13 SBIR/STTR awards
  - 9 Phase I, 1 Phase II, 1 Phase II-E, 2 Phase III
- 2016 | Incorporated as **Astra**
- 2021 | Will go public later this year through a merger with a special-purpose acquisition company (SPAC)

How Do I Get Involved?

Find Your Place in the NASA SBIR/STTR Program

- **Small Business**
  - Looking for Funding
- **Research Institution**
  - Looking for Small Business Partner
- **NASA Agency Representative**
  - Looking for Beneficial Technology
- **Other Government Agency Representative**
  - Looking for Beneficial Technology
- **Mid-to-Large Business**
  - Looking for Suppliers or Subcontractors
- **Investor**
  - Looking to Provide Support

What do I do next?

Who do I talk to?

Next Steps for Small Businesses

What do I do next?

Visit sbir.nasa.gov and read our 2021 solicitation to get an idea of what to expect in 2022:
https://sbir.nasa.gov/solicitations

Visit sbir.gov to learn basics applicable to any agency's SBIR/STTR program:
https://www.sbir.gov/tutorials

Who do I talk to?

Reach out to the SBIR Technology Transition Point of Contact at the NASA Center closest to you.

Link:
https://sbir.nasa.gov/contacts

Next Steps for Research Institutions

What do I do next?

Visit sbir.nasa.gov and read our 2021 solicitation to get an idea of what to expect in 2022.

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Next Steps for NASA Agency Representatives

What do I do next?

Check out the Center Capabilities PDF in our Resource Library under “General Information” to determine which NASA Center is working on your area(s) of interest:
https://sbir.nasa.gov/resource-library

Search our existing portfolio of SBIR/STTR technologies and firms:
https://sbir.nasa.gov/advanced_search

Learn about investment cost-matching programs you may be able to take advantage of:
https://sbir.nasa.gov/content/post-phase-ii-initiatives

Who do I talk to?

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Link:
https://sbir.nasa.gov/contacts

Next Steps for Other Government Agency Reps

What do I do next?

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Who do I talk to?

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Next Steps for Mid-to-Large Businesses

What do I do next?

Check out the Selection Announcements to determine which small businesses are working on your area(s) of interest:
https://sbir.nasa.gov/prg_sched_anncmnt

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Next Steps for Investors

What do I do next?

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Questions?

Visit our website:
www.sbir.nasa.gov