

COURSE 2, TUTORIAL 9

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)



Apollo astronaut Frank Borman once said, “Exploration is the essence of the human spirit.” At the National Aeronautics and Space Administration, better known as NASA, the human spirit gets a lot of exercise. For example, three SBIR companies supplied technology for the Phoenix Lander mission. The Phoenix mission landed in the Mars arctic region where the Mars Odyssey spacecraft previously identified the presence of water. A small business, Honeybee Robotics supplied the icy soil acquisition device; Yardney Technical Products provided lithium-ion batteries; and Starsys Research, now part of SpaceDev, provided key elements of the wet chemistry laboratory. Looking to the future, “the human soul starved for a challenge” will find opportunities on missions to explore deep space with the Space Launch System, with Orion, and missions to Mars.

NASA's combined annual SBIR/STTR budget is between \$190 and \$210 million dollars a year. The topics and subtopics support the needs of the four NASA Mission Directorates (MD) – these are the Aeronautics Research; the Human Exploration and Operations; the Science; and the Space Technology Mission Directorates. The topics and subtopics found in the NASA SBIR and STTR solicitations are defined by the four mission directorates, in combination with the ten NASA centers.

NASA SOLICITATION AND FOCUS AREAS

NASA releases SBIR and STTR topics once a year. Phase I proposals are due the first quarter of the calendar year. The maximum value of Phase I contracts for either SBIR or STTR awards is \$125,000. The period of performance for Phase I SBIR awards is 6 months, while the STTR Phase I award period is 13 months. Phase II contracts are for up to \$750,000

and have a maximum period of performance of 24 months. The Phase II dollar amount and the period of performance are identical for both SBIR and STTR awards.

In each solicitation, there are a wide variety of topics and subtopics organized by **Focus Areas** intended to help proposers understand NASA's needs. The most frequently occurring topics in the FY19 solicitation were mapped to 23 Focus Areas including Power and Energy Storage; Communications and Navigation; Life Support and Habitation Systems; Sensors, Detectors and Instruments; Spacecraft and Platform Subsystems - to name a few. Each topic in the SBIR/STTR solicitation involves a Lead center and one or more other centers, listed as participating centers. All of the 10 Field Centers participate in the SBIR solicitation. Each center acts as a lead for some topics and as the participating center for others.

2019 Focus Areas

- | | |
|---|---|
| <ul style="list-style-type: none"> 01. In-Space Propulsion Technologies 02. Power Energy and Storage 03. Autonomous Systems for Space Exploration 04. Robotic Systems for Space Exploration 05. Communications and Navigation 06. Life Support and Habitation Systems 07. Human Research and Health Maintenance 08. In-Situ Resource Utilization 09. Sensors, Detectors, and Instruments 10. Advanced Telescope Technologies 11. Spacecraft and Platform Subsystems 12. Entry, Descent, and Landing Systems | <ul style="list-style-type: none"> 13. Information Technologies for Science Data 14. In-Space and Advanced Manufacturing 15. Materials, Materials Research, Structures, and Assembly 16. Ground and Launch Processing 17. Thermal Management Systems 18. Air Vehicle Technology 19. Integrated Flight Systems 20. Airspace Operations and Safety 21. Small Spacecraft Technologies 22. Low Earth Orbit Platform Utilization and Microgravity Research 23. Digital Transformation for Aerospace |
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Figure 1: 2019 Focus Areas

Figure 2 shows the progression of technology development from the time of an SBIR/STTR award to commercialization or infusion. NASA, by the way, has always had a strong interest in dual-use applications of NASA-funded technologies. When a NASA funded project is successful in the commercial sector it is said to be commercialized, while NASA uses the term “infusion” to indicate the adoption of a technology by NASA in one or more of its Mission Directorates.

NASA SBIR/STTR Process



Figure 2: NASA SBIR/STTR Process

POST PHASE II INITIATIVES

Post Phase II, companies become eligible for several funding opportunities. **Phase II-E or Extended awards** are meant to encourage the advancement of innovations developed under Phase II. Firms must secure an external investor either from a

non-SBIR/STTR source within NASA or from a source external to NASA. The SBIR/STTR contribution will be up to \$125,000 or up to \$375,000 depending upon the solicitation year in which the original award was made. This award is a one-to-one

match. The period of additional performance for a Phase II-Extended award is six to twelve months. The Phase II Extended program replaces the Phase II Enhancement and Phase II-X programs, which are only available for awardees from FY 2015 Phase II SBIR solicitation. NASA's **Civilian Commercialization Readiness Pilot Program or CCRPP** is an additional funding opportunity available to small business with the purpose of accelerating the transition of SBIR and STTR funded

technologies to commercialization. The program will match between \$500,000 and \$1 million of external investment.

NASA has also partnered with the National Science Foundation (NSF) to provide the **I-Corps program**. This program offers training to select companies on technology commercialization strategies. Additional information on the NASA I-Corps program can be found on the NASA website.

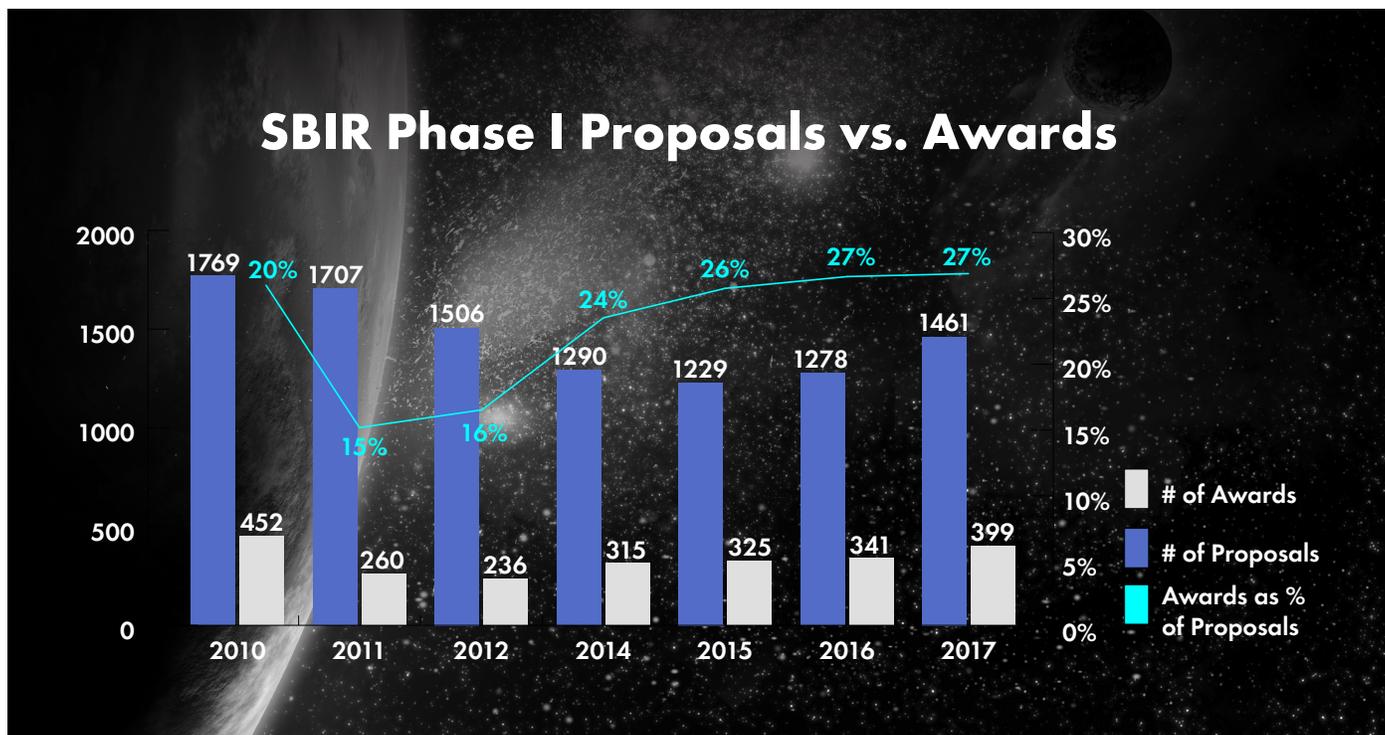


Figure 3: SBIR/STTR Phase I Proposals vs. Awards

With this as background, let's consider the likelihood of winning a NASA SBIR or STTR award. Figure 3 shows the number of proposals received by NASA annually over a period of seven years. Also depicted is the number of Phase I awards made during that period. The range varies in recent years from 15-27%, meaning that of the proposals received, 15 to 27% will win a Phase I award, depending upon the available funding.

As Carl Sagan said "Somewhere, something incredible is waiting to be known." If you are interested in learning more about the "incredible unknown", be sure to explore the NASA SBIR/STTR website, as well as NASA's Technology Area roadmaps. Videos related to the Space Launch System, Orion, and Mars exploration are listed under Tools within this tutorial.