Purpose of SBIR/STTR Programs

- Stimulate technological innovation
- Encourage participation in innovation and entrepreneurship by minority and disadvantaged persons
- Use small businesses to meet federal research and development needs
- Foster technology transfer through cooperative R&D between small businesses and research institutions
- Increase private-sector commercialization of innovations derived from Federal research and development funding
NASA’s annual funding for SBIR and STTR Programs ranges between $150-170 million per year.
SBIR/STTR Agency Funding ~2.6 B

*Others Indicate: DHS, DoC, DoT, EPA, ED, USDA,
Only firms qualifying as Small Business Concerns (SBC) are eligible to participate in these programs.

Socially and economically disadvantaged and women-owned SBCs are particularly encouraged to propose.

R/R&D must be performed in the United States.

50% of the Principal Investigator’s (PI) total employment shall be with the SBC under the SBIR Program, while under the STTR Program, either the SBC or Research Institute (RI) shall employ the PI.
Small Business Concern Eligibility

- is organized for profit, with a place of business located in the United States, which operates primarily within the United States or which makes a significant contribution to the United States economy through payment of taxes or use of American products, materials or labor
- is in the legal form of an individual proprietorship, partnership, limited liability company, corporation, joint venture, association, trust or cooperative; except that where the form is a joint venture, there can be no more than 49 percent participation by business entities in the joint venture
- is at least 51 percent owned and controlled by one or more individuals who are citizens of, or permanent resident aliens in, the United States: except in the case of a joint venture, where each entity to the venture must be 51 percent owned and controlled by one or more individuals who are citizens of, or permanent resident aliens in, the United States
- has, including its affiliates, not more than 500 employees.
- Visit the SBA website if you have questions about eligibility http://www.sba.gov
• The awards are always to a small business
  – In SBIR, a research institution, e.g. a university may participate with the small business
  – In STTR, a research institute must participate with the small business
3-Phase Program

- **Phase 1**
  - Feasibility study, 6 months duration
  - $125K (maximum allowable $150K)

- **Phase 2**
  - Technology or Prototype Development/Demonstration, 2-Year Contract Award
  - $750K (maximum allowable $1 million)

- **Phase 2 Extended and eXpanded, or Phase 2-E and Phase 2-X**
  - Funding to “bridge the gap” to a Phase 3 opportunity
  - Requires non-SBIR/STTR matching funding

- **Phase 3**
  - Technology Infusion/Commercialization Stage
  - Ability to award sole-source contracts without further need for Justification Other than Full and Open competition; (No JOFOC) based on specific SBIR authority
### General: 3 Phase Program

<table>
<thead>
<tr>
<th>Phase 1 Contracts</th>
<th>SBIR/STTR</th>
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<tbody>
<tr>
<td>Maximum Contract Value</td>
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<tr>
<td>Period of Performance</td>
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<table>
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<tr>
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<td>Maximum Contract Value</td>
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<td>Period of Performance</td>
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### Select Phase 1 Contracts

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<tr>
<td>Maximum Contract Value</td>
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<td>6 months</td>
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### Select Phase 2 Contracts

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<tr>
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<td>Period of Performance</td>
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* $$ is double that of the regular SBIR/STTR Phase 2 Contract Value
### Phase 2-Enhancement (2-E)

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<tr>
<th>Phase 2-E</th>
<th>Minimum non-SBIR/STTR Funding Required for Eligibility for Matching in Phase 2-E</th>
<th>Corresponding SBIR/STTR Program Contribution</th>
<th>Anticipated Period of Additional Performance</th>
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<tr>
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<td>$25,000</td>
<td>$25,000</td>
<td>6-12 Months</td>
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<tr>
<td></td>
<td>Maximum non-SBIR/STTR Funding to be Matched by SBIR/STTR Program in Phase 2-E</td>
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<tr>
<td></td>
<td>$125,000</td>
<td>$125,000</td>
<td>6-12 Months</td>
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### Phase 2-eXpanded (2-X)

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<tr>
<th>Phase 2-X</th>
<th>Minimum Funding Required from non-SBIR/STTR NASA Source for Eligibility for Matching in Phase 2-X</th>
<th>Corresponding SBIR/STTR Program Contribution</th>
<th>Anticipated Period of Additional Performance</th>
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<tbody>
<tr>
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<td>$75,000</td>
<td>$150,000</td>
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<td>Maximum Funding Amount from non-SBIR/STTR NASA Source to be Matched in Phase 2-X</td>
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<tr>
<td></td>
<td>$250,000</td>
<td>$500,000</td>
<td>12-24 Months</td>
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</table>
SBIR/STTR Technology Award Stages

Phase I
- General
- Select

Phase II
- General
- Select
- Phase II-E
- Phase II-X

Phase III
- Non-SBIR: Contract from NASA Program or Center
- SBIR: CRP

Concept → Infusion or Commercialization
Commercialization Readiness Pilot

CRP
• Allowed as result of re-authorization legislation
• Goal: Enable technology maturation for infusion and commercialization
• NASA programs and industry act as Sponsors
  – Sponsors must illustrate how they intend to conduct critical risk reduction or test-and-demonstration activities, which if not conducted would limit commercialization opportunities
  – SBIR/STTR Program will be able to provide matching funding for technology maturation, in partnership with Sponsors that provide other matching funds
• Matching funds from sponsor are required for the CRP
FY14 Limited Pilot

• Executed limited pilot effort for a CRP in FY 2014, which will expand in FY 2015
  – High priority NASA technology needs driven by NASA programs and missions
  – Currently examining process used in FY14

• Anticipate a user guide and forms on NASA SBIR website in FY15

• NASA Advocate was required in FY14, and will be required in the future
  – Advocate must present a SBIR/STTR Technology Maturation Plan (STMP) to the SBIR/STTR Program
  – the STMP must identify detailed technology development objectives and deliverables, funding needs, schedule, opportunities and plans for infusion or commercialization
As mentioned earlier, we are examining the process used in FY14 for enhancement and streamlining purposes.

You may find additional information and future updates at:

- http://sbir.nasa.gov/node/54467
Phase I Proposals vs Awards

SBIR Phase 1
- # of Proposals
- # of Awards

STTR Phase 1
- # of Proposals
- # of Awards
Phase II Proposals vs awards

SBIR
Phase 2
- # of Proposals
- # of Awards

STTR
Phase 2
- # of Proposals
- # of Awards

PY 2009
PY 2010
PY 2011
PY 2012

# of Proposals

# of Awards
Percent selected by size category

- 14% first-time proposer/first-time selectees
- 24% first-time selectees
Part of new focus a **Space Technology At NASA**
- One of 9 Programs within Space Technology Mission Directorate – tackling new technology development challenges across all “Technology Readiness Levels”

**SBIR & STTR**
- Topics/Subtopics developed to support the needs of NASA’s other Mission Directorates – Science, Human Exploration & Operations, Aeronautics Research
- Topics/Subtopics developed to support mid- to long-term technology development needs identified in NASA’s “Space Technology Roadmaps” or the National Aeronautics R&D Plan

**NASA Centers Play Critical Role**
- All SBIR/STTR projects are managed at one of NASA’s 10 Centers – home to NASA’s development projects, research facilities, and Subject Matter Experts
NASA Innovative and Advanced Concepts (NIAC) – “Study innovative, technically credible, advanced concepts that could one day ‘Change the Possible’ in aerospace”

Space Technology Research Grants and Fellowships – Graduate student research fellowships and grants to academia, NASA field centers and not-for-profit R&D laboratories

Center Innovation Fund (CIF) – stimulate innovation within the NASA Centers support emerging technologies and creative initiatives - NASA scientists and engineers lead projects, partnerships with other agencies, academia and private industry are encouraged.

Centennial Challenges – Prize Competitions

Small Business Innovative Research (SBIR)/Small Business Technology Transfer (STTR)

Small Spacecraft Technology Program - Accelerate the development of small spacecraft capabilities for NASA, commercial, and other space sector users.

Flight Opportunities - Create multiple paths through which innovative technologies may be matured from concept to flight by facilitating low-cost access to suborbital environments

Game Changing Development (GCD) – Develop technologies that produce “dramatic” impacts for NASA’s Space Exploration and Science Missions; a balanced approach of guided technology development efforts and competitively selected efforts

Technology Demonstration Missions (TDM) - Seeks to mature laboratory-proven technologies to flight-ready status; system-level technology solutions are given the opportunity to operate in the actual space environment

http://www.nasa.gov/directorates/spacetech/home/index.html#.U8_ltBYbbtU
How does NASA define subtopics?

- Mission Directorates
- Mission and program specific needs
- NASA SBIR Solicitation
- Space Technology Mission Directorates
- Space tech not covered by other MDs
- NASA STTR Solicitation
- Center Chief Technologists
- Specific center objectives aligned to NASA missions
Space Technology Technical Areas

- LAUNCH PROPULSION SYSTEMS
- IN-SPACE PROPULSION TECHNOLOGIES
- SPACE POWER & ENERGY STORAGE
- ROBOTICS, TELE-ROBOTICS & AUTONOMOUS SYSTEMS
- COMMUNICATION & NAVIGATION
- HUMAN HEALTH, LIFE SUPPORT & HABITATION SYSTEMS
- HUMAN EXPLORATION DESTINATION SYSTEMS
- SCIENCE INSTRUMENTS, OBSERVATORIES & SENSOR SYSTEMS
- ENTRY, DESCENT & LANDING SYSTEMS
- NANOTECHNOLOGY
- MODELING, SIMULATION, INFORMATION TECHNOLOGY & PROCESSING
- MATERIALS, STRUCTURES, MECHANICAL SYSTEMS & MANUFACTURING
- GROUND & LAUNCH SYSTEMS PROCESSING
- THERMAL MANAGEMENT SYSTEMS
Space Technology Future Thrust Areas

**High Power Solar Electric Propulsion**
- Deep space human exploration, science missions and commercial applications with investments in advanced solar arrays, high-power Hall thrusters and power processing units.

**Space Optical Comm.**
- Substantially increase the available bandwidth for near Earth space communications currently limited by power and frequency allocation restrictions, and increase the communications throughput for deep space mission.

**Advanced Life Support & Resource Utilization**
- Technologies for human exploration mission including Mars atmospheric in-situ resource utilization, near closed loop air revitalization and water recovery, EVA gloves and radiation protection.

**Mars Entry Descent and Landing Systems**
- Permits more capable science missions, eventual human missions to Mars including, hypersonic and supersonic aerodynamic decelerators, a new generation of compliant TPS materials, retro-propulsion technologies, instrumentation and modeling capabilities.

**Space Robotic Systems**
- Creates future humanoid robotics, autonomy and remote operations technologies to substantially augments the capability of future human space flight missions.

**Lightweight Space Structures**
- Targets substantial increases in launch mass, and allow for large decreases in needed structural mass for spacecraft and in-space structures.

**Deep Space Navigation**
- Allows for more capable science and human exploration missions using advanced atomic clocks, x-ray detectors and fast light optical gyroscopes.

**Space Observatory Systems**
- Allows for significant increases in future science capabilities including, AFTA/WFIRST coronagraph technology to characterize exoplanets by direct observation and advances in the surface materials as well as control systems for large space optics.
Understanding NASA Needs

- **In Science** – “Decadal Surveys” and NASA-developed implementation documents
  - Planetary Science
  - Astronomy and Astrophysics
    - [http://science.nasa.gov/media/medialibrary/2013/04/15/secure-mpPlan_R2_15Apr2013.pdf](http://science.nasa.gov/media/medialibrary/2013/04/15/secure-mpPlan_R2_15Apr2013.pdf)
  - Heliophysics (Solar and Space Physics)
  - Earth Science
    - [http://esto.nasa.gov/](http://esto.nasa.gov/)

- **In Aeronautics Research**
  - National Aeronautics R&D Plan
    - [http://www.whitehouse.gov/sites/default/files/microsites/ostp/aero-rdplan-2010.pdf](http://www.whitehouse.gov/sites/default/files/microsites/ostp/aero-rdplan-2010.pdf)
  - Various Detailed NASA Aeronautics Research documents
    - [http://www.aeronautics.nasa.gov/programs.htm](http://www.aeronautics.nasa.gov/programs.htm)
Key Successes: Curiosity Rover

- Yardney Technical Products, Pawcatuck CT: Lithium ion batteries
- Creare, Hanover NH: Space-qualified vacuum pump
- Starsys Research, Boulder CO: Gearboxes for robotic arm
- Honeybee Robotics, New York NY: Dust removal tool
- inXitu, Campbell, CA: Chemistry and Mineralogy experiment (CheMin) instrument
- Grammatech, Ithaca NY: Software for rover operations
NASA WEB SITES
&
ELECTRONIC HANDBOOK
NASA SBIR Website

http://sbir.nasa.gov
Solicitation Topics

View by Mission Directorate Technology Area

Legend  Subtopic has been amended

The SBIR Program Solicitation topics and subtopics are developed by the NASA Mission Directorates and Centers in coordination with the NASA SBIR/STTR programs.

There are four Mission Directorates (MDs):

- **Aeronautics Research**
  NASA's Aeronautics Research Mission Directorate (ARMD) expands the boundaries of aeronautical knowledge for the benefit of the Nation and the broad aeronautics community, which includes the Agency’s partners in academia, industry, and other government agencies. ARMD is conducting high-quality... [Read more]

- **Human Exploration and Operations**
  The Human Exploration and Operations Mission Directorate (HEOMD) is chartered with the development of the core transportation elements, key systems, and enabling technologies required for beyond-Low Earth Orbit (LEO) human exploration that will provide the foundation for the next half-century of... [Read more]

- **Science**
  NASA leads the nation on a great journey of discovery, seeking new knowledge and understanding of our planet, Earth, our Sun and solar system, and the universe out to its farthest reaches and back to its earliest moments of existence. NASA’s Science Mission Directorate (SMD) and the nation’s... [Read more]

- **Space Technology**
  The Space Technology Mission Directorate (STMD) enables a new class of missions by drawing on talent from the NASA workforce, academia, small businesses, and the broader space enterprise to deliver innovative solutions that dramatically improve technological capabilities for NASA and the Nation. The... [Read more]
Solicitation Topics

There are four Mission Directorates (MDs):

- **Aeronautics Research**
  NASA’s Aeronautics Research Mission Directorate (ARMD) expands the boundaries of aeronautical knowledge for the benefit of the Nation and the broad aeronautics community, which includes the Agency’s partners in academia, industry, and other government agencies. ARMD is conducting high-quality,... Read more>>

  - **Topic A1 Aviation Safety**
    The Aviation Safety Program conducts fundamental research and technology development of known and predicted safety concerns as the nation transitions to the Next Generation Air Transportation System (NextGen). Future challenges to maintaining aviation safety arise from expected significant increases... Read more>>

  - **Topic A2 Unmanned Aircraft Systems**
    The Integrated Systems Research Program (ISRP) conducts research at an integrated system-level on promising concepts and technologies and explores, assesses and/or demonstrates their benefits in a relevant environment. The integrated system-level research in this program will be coordinated with... Read more>>

  - **Topic A3 Air Vehicle Technology**
    The Air Vehicle Technology topic solicits cutting-edge research in aeronautics to overcome technology barriers and challenges in developing highly efficient aircraft systems of the future, with reduced impact to the environment. The primary objective is the development of innovative design tools,... Read more>>

  - **Topic A4 Ground and Flight Test Techniques and Measurement**
    The Aeronautics Test Program (ATP) supports the experimental modeling and simulation requirements of NASA’s Aeronautics Research Mission Directorate from takeoff speeds through Mach 10. It ensures the long-term availability and health of NASA’s major wind tunnels/ground test facilities and flight... Read more>>
YOU MUST FIRST BE REGISTERED WITH THE SMALL BUSINESS ADMINISTRATION AT: http://www.sbir.gov/registration
This Electronic Handbook (EHB) is designed to help you prepare and submit proposals using a paperless process. Please visit the NASA SBIR/STTR Firms Library to view templates and samples of all potential deliverables, including those required for proposal submissions. Then return to this EHB to submit your proposals. Refer to Background to learn more about the NASA SBIR/STTR Programs. If you have not done so yet, please read “What’s New” which lists the significant differences from last year.

We strongly encourage you to start using the Handbook early in the process of submitting your SBIR and/or STTR proposals.

WARNING! This is a US Government System for the use of authorized users only. By accessing and using the computer system you are consenting to system monitoring, including the monitoring of keystrokes. Unauthorized use of, or access to, this computer system may subject you to disciplinary action and criminal prosecution.

ATTENTION
Proposals are due by 5:00 p.m. ET on 07/31/2014. Submissions after the deadline will be considered LATE and handled accordingly.
Please review the proposal instructions outlined in the Solicitation and read the Form instructions (opens in new window) carefully before proceeding. You can also view the NASA SBIR/STTR Firms Library for proposal samples. For security reasons, we recommend that you logout (see link on top right) when your session is over.

Firms are required to complete the Certifications, Audit Information, and Commercial Metrics Survey sections that are applicable across all proposals submitted to this Solicitation. In addition, if your firm has received more than 15 Phase II awards in the prior 5 fiscal years, you must complete the Prior Awards Addendum. These are all accessible via the left-hand menu or via the Status section below.

For each individual proposal submission, Firms are required to electronically complete Forms A, B, C and the briefing chart; upload the Technical Proposal; and electronically endorse the submission. To start a proposal click on “Start New Proposal”. Once the proposal has been initiated, updates can be made via the Activity Worksheet below.

**Note:** The designated Firm Admin, typically the first person to register your Firm, is the only individual authorized to update the Firm level certifications and forms identified below.

**Status of Required Firm Level Forms**

- Certifications: Complete
- Audit Information: Incomplete
- Prior Awards Addendum: Complete
- Commercial Metrics Survey: Not Started

**Legend:**
- ☐ Not Started
- ☑ Complete
- ❌ Incomplete
- ☐ Optional

Listed below are all the proposals you have started.

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<th>Description</th>
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<tr>
<td>Briefing Chart</td>
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Provide Access to Official/Others | Endorse Proposal (To be endorsed by SBC Official, Principal Investigator) | Print Forms
Please read the instructions (opens in new window) carefully before proceeding. If you used the browser’s BACK button to come to this page, please reload/refresh now.

**Labor Costs and Information:** Enter the labor description and cost for each person who will be working on the proposed research effort. Please note that each employee’s contribution to the project must be identified in the technical proposal. Do not include labor costs for employees who are not directly contributing to the project. Costs for these should be included in the Overhead or G&A sections of this proposed budget.

Please detail the labor used for each year of the proposed research effort separately below.

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<thead>
<tr>
<th>Category</th>
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<th>Years of Experience</th>
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Welcome to NASA SBIR/STTR Firm Library

The NASA SBIR/STTR Firm Library contains templates and samples of all potential proposal and contract deliverables for Phase I and Phase II. This library should be utilized by the Firms to aid in the preparation of their deliverables. Firms must submit their deliverables via the Electronic Handbooks (EHBs). Click here to access the Awardee Firm’s Contract Administration and Closeout Electronic Handbook.

<table>
<thead>
<tr>
<th>Links</th>
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<tr>
<td>Phase I Proposal</td>
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<tr>
<td>Phase I Draft Model Contracts</td>
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<td>Phase I Contract Interim Deliverables</td>
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Thank you!