National Aeronautics and Space Administration

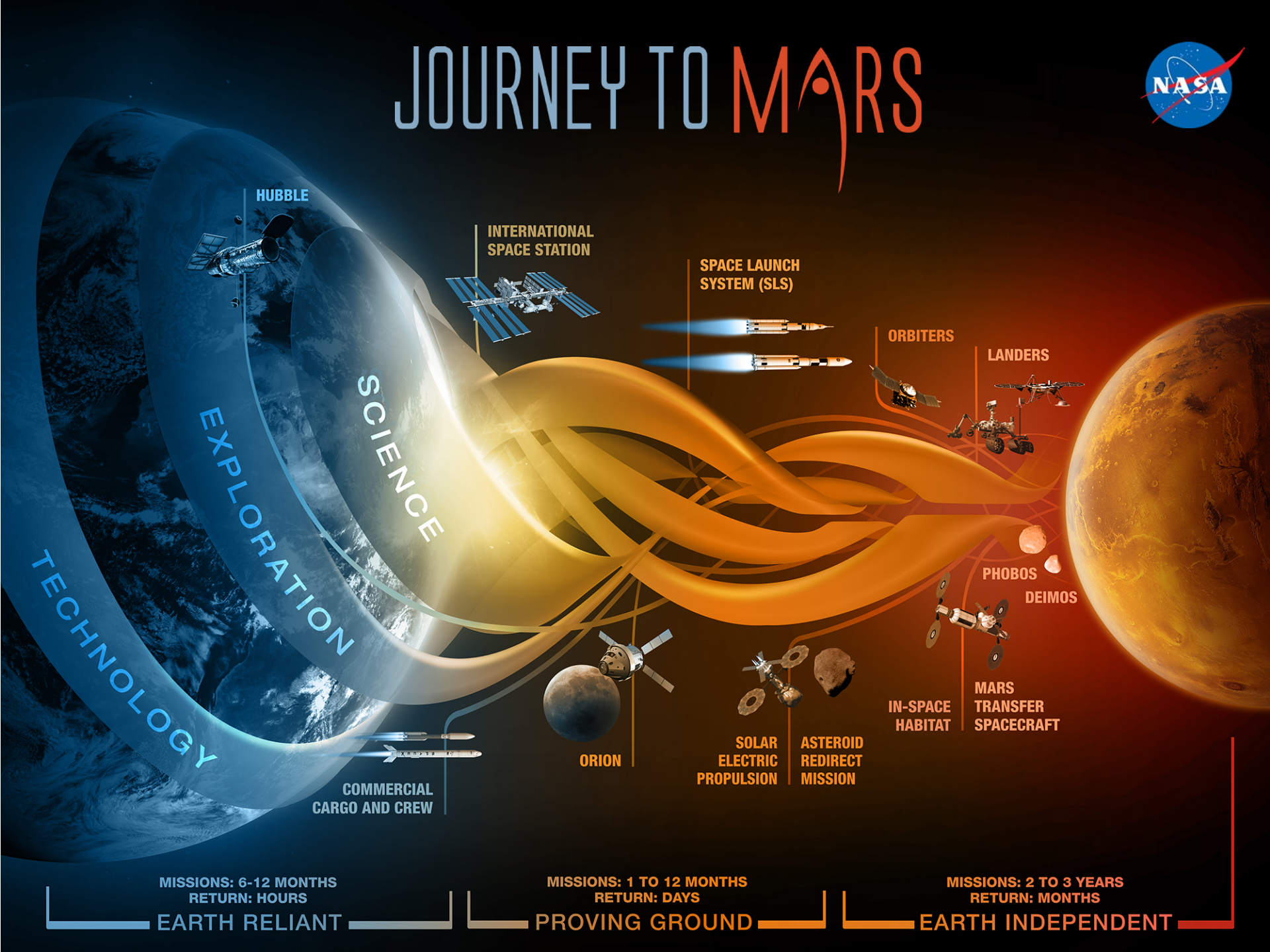
NASA

Small Business Innovation Research
Small Business Technology TRansfer

Dr. Joseph Grant
Deputy Program Executive

September 14, 2016

JOURNEY TO MARS



MISSIONS: 6-12 MONTHS
RETURN: HOURS
EARTH RELIANT

MISSIONS: 1 TO 12 MONTHS
RETURN: DAYS
PROVING GROUND

MISSIONS: 2 TO 3 YEARS
RETURN: MONTHS
EARTH INDEPENDENT

SBIR/STTR Program History

- Created by Roland Tibbetts at the National Science Foundation and signed as a Federal wide program in 1982 by Ronald Reagan

- Created in 1992 by the Small Business Research and Development Enhancement Act of 1992, **STTR seeks to bridge the gap between basic science and commercialization of resulting innovations**.

- SBIR programs have awarded over $40 billion to research-intensive American small businesses

- The 450,000 engineers and scientists involved are one of the largest STEM talent concentrations in the world

Goals of the SBIR/STTR Programs

- Stimulate technological innovation.
- Meet Federal research and development needs.
- Foster and encourage participation in innovation and entrepreneurship by socially and economically disadvantaged persons.
- Increase private-sector commercialization of innovations derived from Federal research and development (R&D) funding.
- Foster technology transfer through cooperative R&D between small businesses and research institutions.

NASA's SBIR and STTR programs have awarded over $3.3B to research-intensive American small businesses to date. Engineers and scientists from over 12,000 Firms in all 50 States, DC and Puerto Rico have participated. On average each year 1,700 NASA scientists and engineers support the program performing technical reviews.

Why SBC's Participate in SBIR/STTR?

1. Over $2.25 Billion available every year
2. Funds are NOT A LOAN - no repayment - up to $875K capital
3. Small businesses retain intellectual property rights
4. Can protect from disclosure generated data for up to 4 years
5. Provides seed money to fund high risk projects
6. Develop working relationship & credibility with government R&D
7. Fosters partnerships with large corporations and academia
8. Provides recognition and visibility for your business
9. Participation attracts venture capital and other funding sources

SBIR + STTR Programs

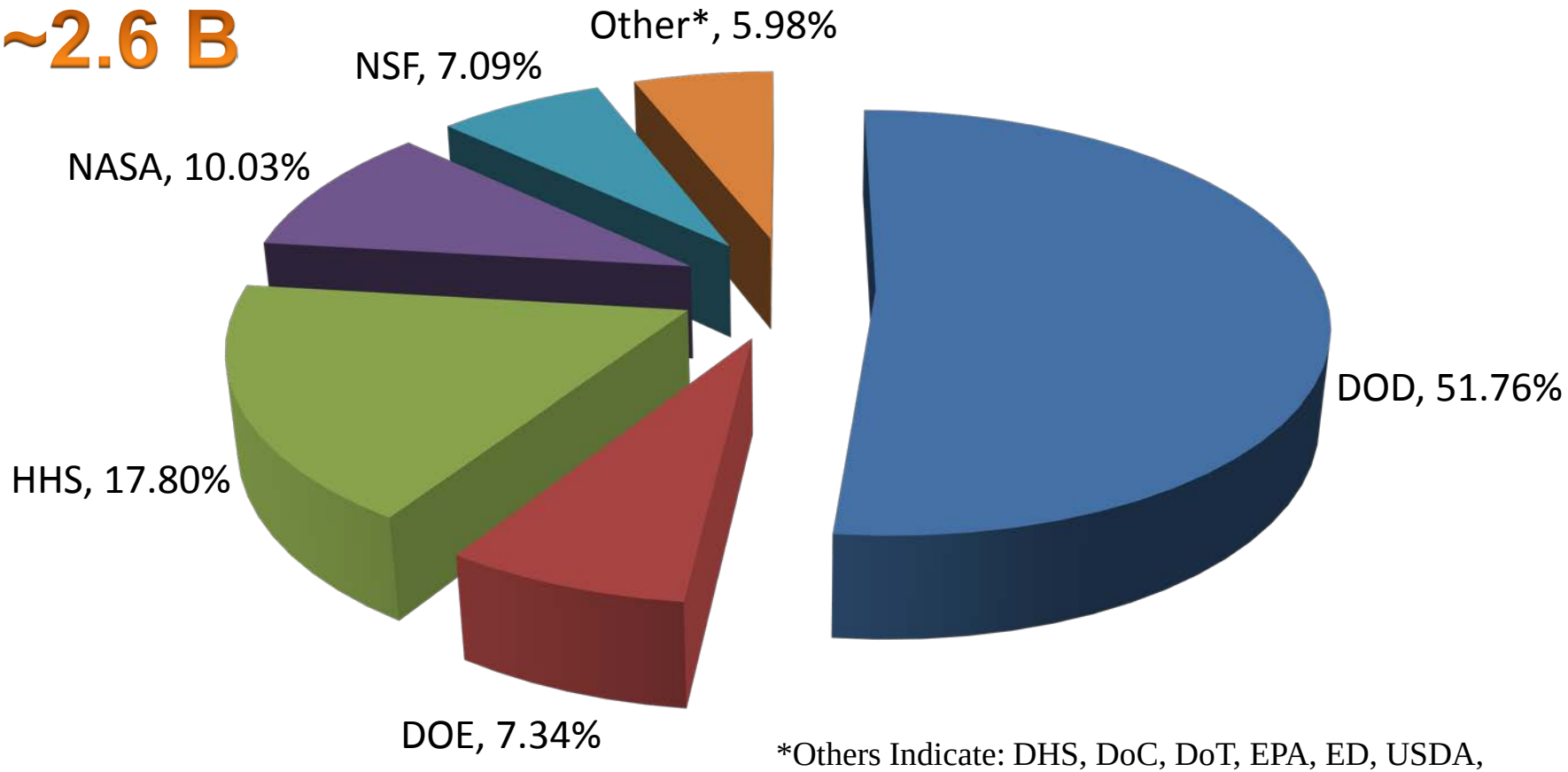
- Department of Defense (DoD)
- Department of Health and Human Services (HHS)
- Department of Energy (DoE)
- National Aeronautics and Space Administration (NASA)
- National Science Foundation (NSF)

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)

Percentage of SBIR/STTR Awards by Agency (last 4 years)

SBIR/STTR Agency Funding FY2015 ~2.6 B

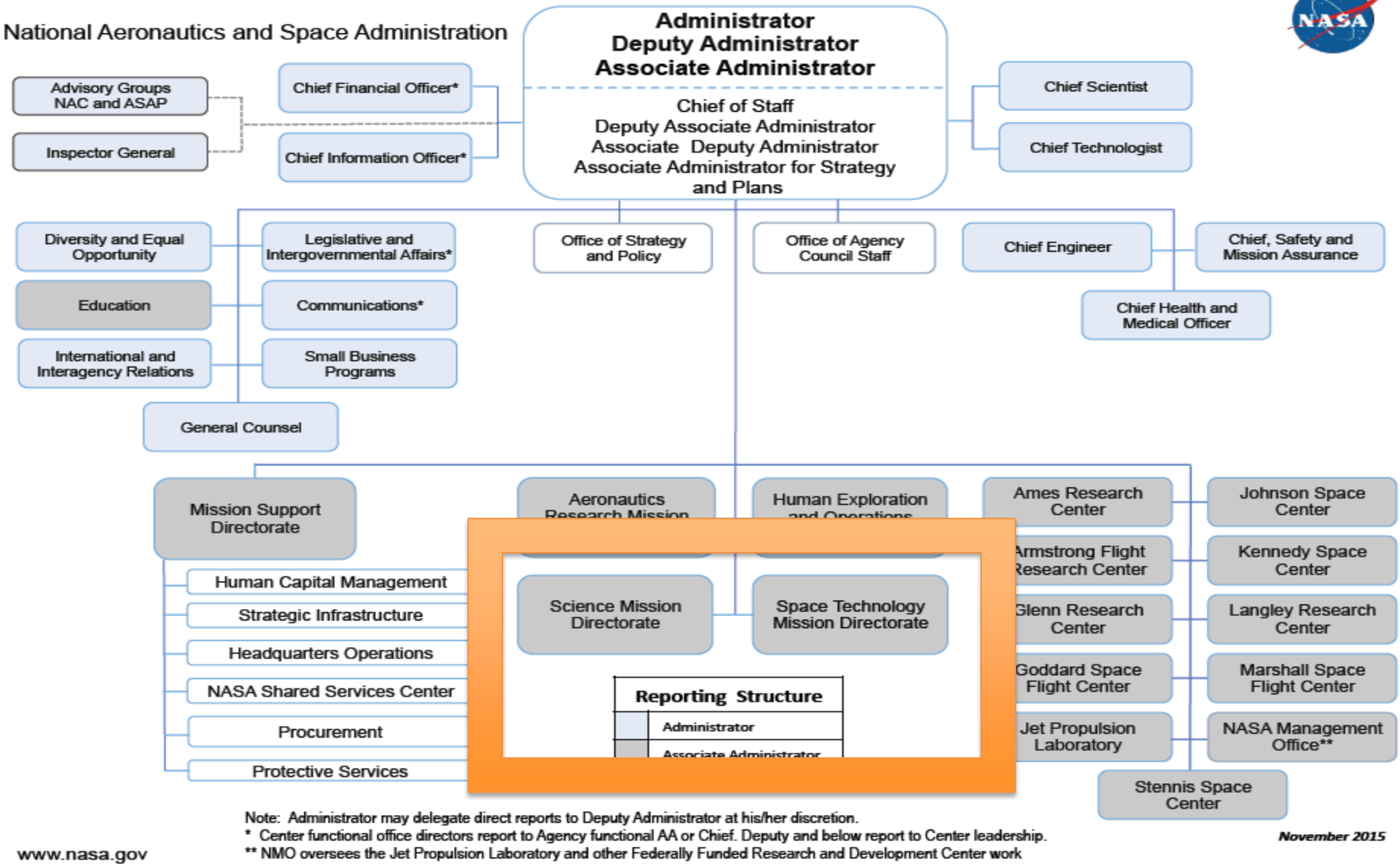


*Others Indicate: DHS, DoC, DoT, EPA, ED, USDA,

Percentages of Extramural R/R&D Budget for SBIR/STTR

	FY12	FY13	FY14	FY15	FY16	FY17
SBIR	2.6%	2.7%	2.8%	2.9%	3.0%	3.1%
STTR	0.35%	0.35%	0.40%	0.40%	0.45%	0.45%
Combined	2.95%	3.05%	3.20%	3.30%	3.45%	3.65%

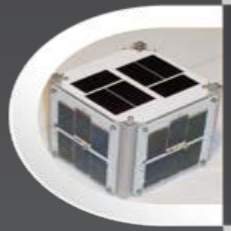
By federal law NASA is required to set aside the below percentages of its extra-mural R/R&D budget for the SBIR and STTR Programs, which increases incrementally until 2017


National Aeronautics and Space Administration
Administrator
Deputy Administrator
Associate Administrator
Chief of Staff
Deputy Associate Administrator
Associate Deputy Administrator
Associate Administrator for Strategy and Plans
Advisory Groups NAC and ASAP
Inspector General
Chief Financial Officer*
Chief Information Officer*
Chief Scientist
Chief Technologist
Diversity and Equal Opportunity
Education
International and Interagency Relations
General Counsel
Legislative and Intergovernmental Affairs*
Communications*
Small Business Programs
Office of Strategy and Policy
Office of Agency Council Staff
Chief Engineer
Chief, Safety and Mission Assurance
Chief Health and Medical Officer
Mission Support Directorate
Human Capital Management
Strategic Infrastructure
Headquarters Operations
NASA Shared Services Center
Procurement
Protective Services
Aeronautics Research Mission
Human Exploration and Operations
Science Mission Directorate
Space Technology Mission Directorate
Reporting Structure
Administrator
Associate Administrator
Ames Research Center
Armstrong Flight Research Center
Glenn Research Center
Goddard Space Flight Center
Jet Propulsion Laboratory
Johnson Space Center
Kennedy Space Center
Langley Research Center
Marshall Space Flight Center
NASA Management Office**
Stennis Space Center
Note: Administrator may delegate direct reports to Deputy Administrator at his/her discretion.
* Center functional office directors report to Agency functional AA or Chief. Deputy and below report to Center leadership.
** NMO oversees the Jet Propulsion Laboratory and other Federally Funded Research and Development Center work
November 2015
www.nasa.gov

Space Technology Programs

Transformative & Crosscutting Technology Breakthroughs

Technology Demonstration Missions
bridges the gap between early proof of concept tests and the final infusion of cost effective, revolutionary technologies into successful NASA, government and commercial space missions.

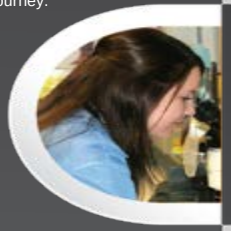


Small Spacecraft Technology Program
develops and demonstrates new capabilities employing the unique features of small spacecraft for science, exploration and space operations.

Game Changing Development
seeks to identify and rapidly mature innovative/high impact capabilities and technologies that may lead to entirely new approaches for the Agency s broad array of future space missions.

Pioneering Concepts/Developing Innovation Community

NASA Innovative Advanced Concepts (NIAC)
nurtures visionary ideas that could transform future NASA missions with the creation of breakthroughs radically better or entirely new aerospace concepts while engaging America's innovators and entrepreneurs as partners in the journey.



Space Technology Research Grants
seek to accelerate the development of push" technologies to support future space science and exploration needs through innovative efforts with high risk/high payoff while developing the next generation of innovators through grants and fellowships.

Center Innovation Fund
stimulates and encourages creativity and innovation within the NASA Centers by addressing the technology needs of the Agency and the Nation. Funds are invested to each NASA Center to support emerging technologies and creative initiatives that leverage Center talent and capabilities.

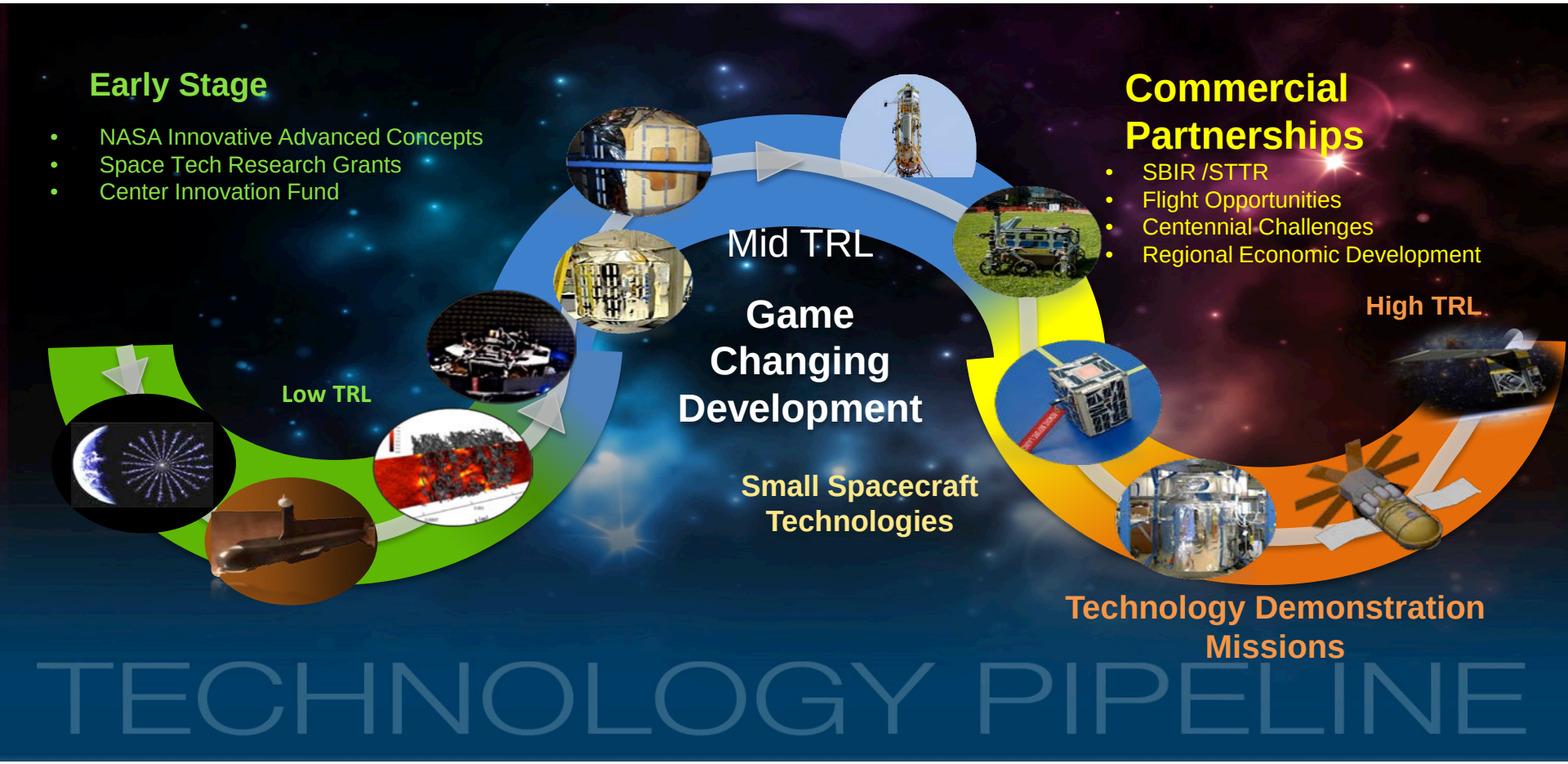
Creating Markets & Growing Innovation Economy

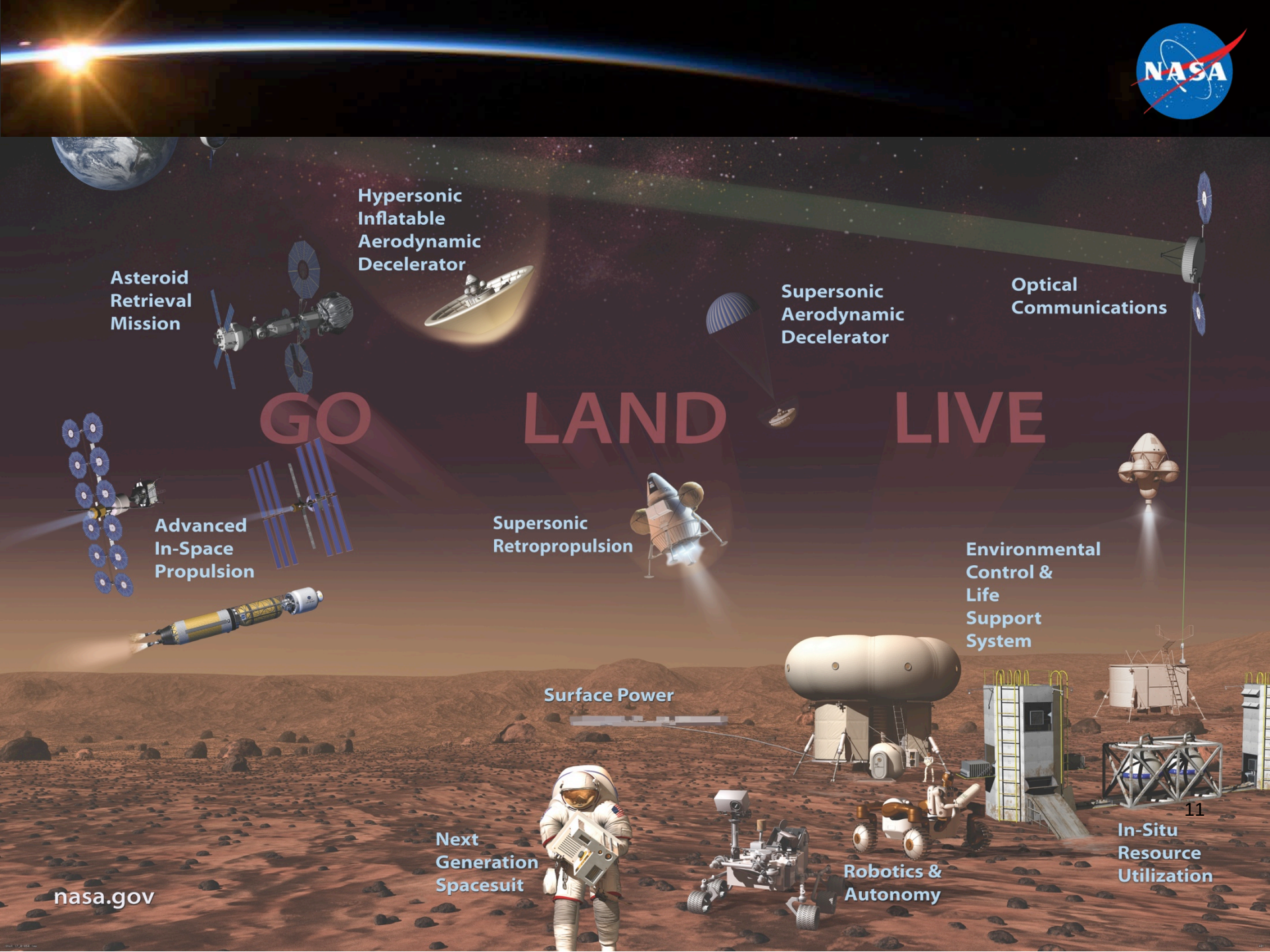
Centennial Challenges
directly engages nontraditional sources advancing technologies of value to NASA s missions and to the aerospace community. The program offers challenges set up as competitions that award prize money to the individuals or teams that achieve a specified technology challenge.

Flight Opportunities
facilitates the progress of space technologies toward flight readiness status through testing in space relevant environments. The program fosters development of the commercial industry.

Small Business Innovation Research (SBIR) and Small Business Technology

Space Technology Pipeline




Asteroid Retrieval Mission
Hypersonic Inflatable Aerodynamic Decelerator
Supersonic Aerodynamic Decelerator
Optical Communications
GO
LAND
LIVE
Advanced In-Space Propulsion
Supersonic Retropropulsion
Environmental Control & Life Support System
Surface Power
Next Generation Spacesuit
Robotics & Autonomy
In-Situ Resource Utilization
nasa.gov

Program Eligibility Criteria

Eligibility Criteria

Is your business organized as a for-profit company?

- An SBIR/STTR small business (no more than 500 employees) awardee must be a business concern – it must be organized as a for-profit concern and meet all of the other requirements for a "business concern" in 13 C.F.R. § 121.105.

Is your principal place of business located in the United States?

- All businesses that apply for the SBIR/STTR program must be for-profit companies located in the US.

Must I own a company to receive an SBIR/STTR award?

- SBIR/STTR awards go only to small, for-profit, firms that meet the above definition of an SBC. This includes sole proprietorships.

In addition:

- For SBIR, the primary employment of the principal investigator must be with the small business, and the proposing firm must perform at least 2/3rds of the R&D work in Phase I and at least 1/2 in Phase II

- For STTR, the proposing firm must perform at least 40% of the work with the collaborating research institution performing no less than 30%.

Eligibility Requirements

Small Business Innovation Research (SBIR)

1. Organized for-profit U.S. business
2. At least 51% U.S. owned by individuals and independently operated
3. 500 or fewer employees
4. PI's primary employment with small business during project
5. Intellectual Property Agreement

Small Business Technology Transfer (STTR)

1. Formal Cooperative R&D Effort with a U.S. Research Institution
2. Minimum 40% by small business, 30% by U.S. Research Institution
3. Small business is Prime, PI can be from SBC or Research Institution
4. Other SBIR Requirements Apply

Structure of the Programs

Phase I: Concept

- Award Guideline: $125K
- Duration: 6 months (SBIR)
  12 months (STTR)

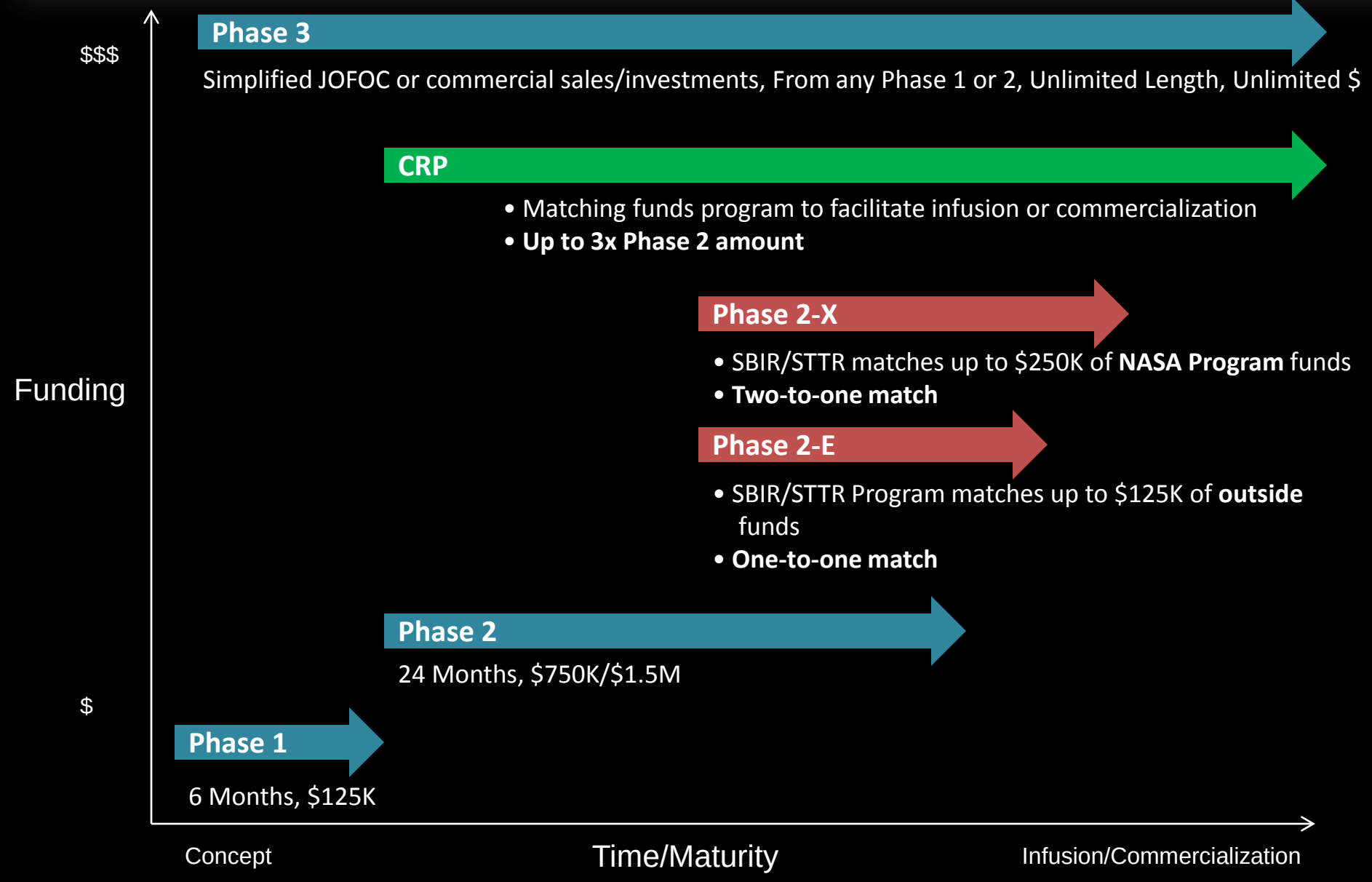
Phase II: Full Research, R&D to Prototype

- Award Guideline: $750K
- Duration: 24 months
  - Phase II-E

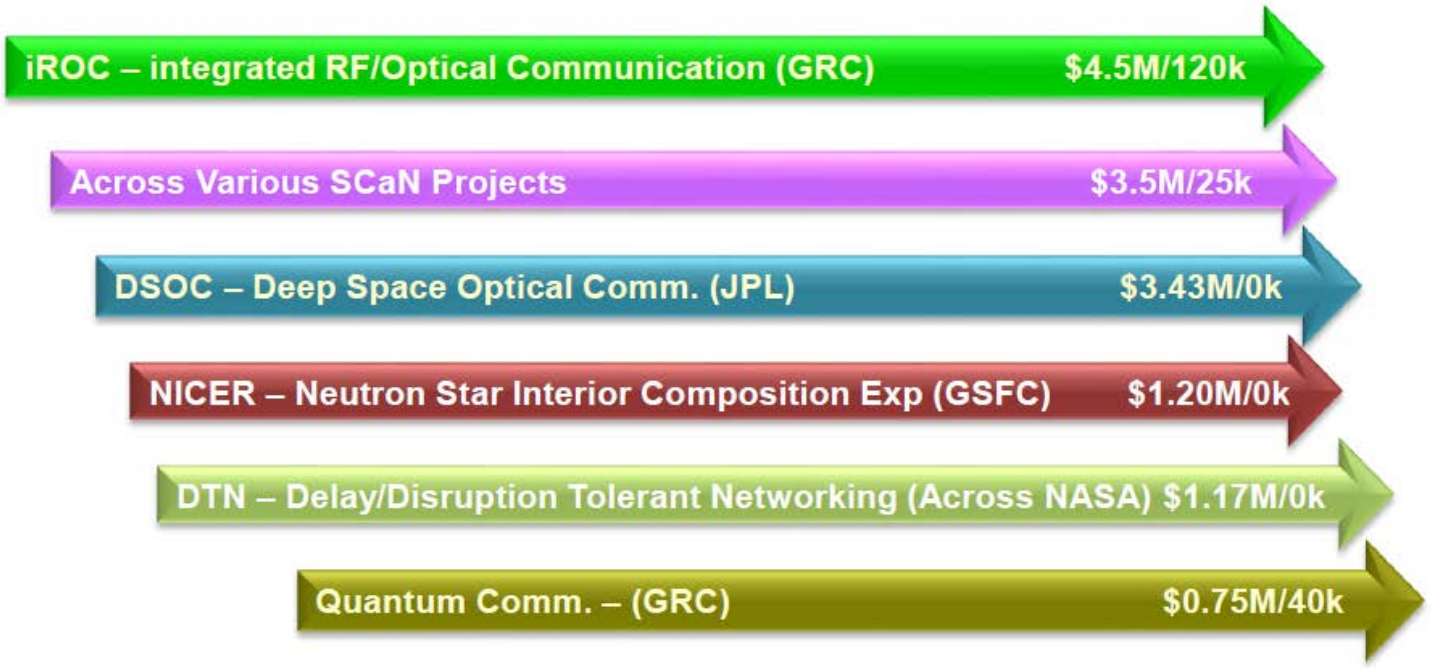
Phase III: Commercialization/Infusion

- Non-SBIR/STTR funds
  - Contract from NASA program, other agency, prime contractor

SBIR/STTR Integrated Portfolio



SBIR Technology Infusion into SCaN Projects



SCaN highly leveraged SBIR funds for these product developments

$14.55M/$0.165M (Total SBIR $ / SCaN $)

DATA Courtesy of SCaN

Post Phase II Investment Activities [2011-Present]

The table below shows data for Post Phase II Activities related to SBIR/STTR awards from 2011 to present.

This data was maintained by individual centers prior to FY16 and has not been validated. Starting in FY16, all post phase II activities where NASA investments are made will be tracked by the EHB and executed by NSSC. Efforts to validate the existing data will be undertaken in FY16.

		2011	2012	2013	2014	2015	2016	Totals
NASA	Post PII Activity	118	125	96	84	107	15	545
	Funding	$55,771,534.30	$48,559,818.90	$58,794,949.04	$29,751,600.84	$68,635,550.10	$16,235,032.63	$277,748,485.81
Non-NASA	Post PII Activity	146	176	185	158	89	42	796
	Funding	$87,370,374.00	$155,224,410.80	$126,616,065.40	$106,248,511.30	$103,528,799.60	$21,840,455.15	$600,828,616.25

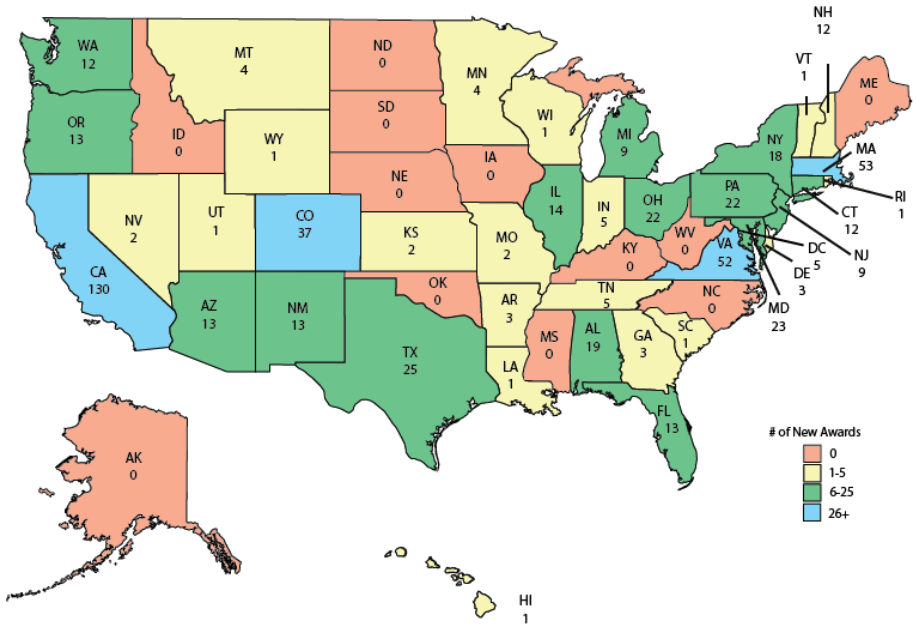
NASA SBIR/STTR Budget

Award Budget FY16:

SBIR: $161.5M **STTR:** $24.9M

- SBIR is 3.0% and STTR is .45% of extramural R&D budget in FY16 (Oct 1)
  - In FY17, NASA will increase the SBIR investment to 3.2%

Fiscal Year 2015 SBIR/STTR Awards (Phase I, II, & II-E)

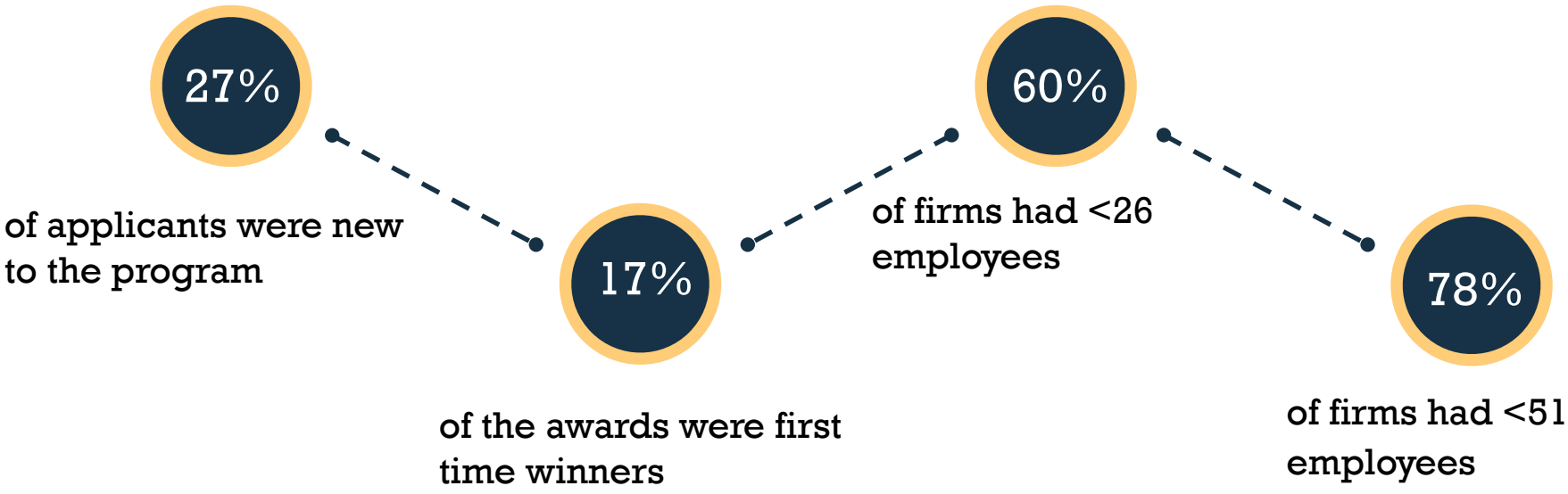


FY 15 Awards At-A-Glance:

- SBIR Awards: 325 Phase I and 119 Phase II; 7 Phase I Selects and 10 Phase II Selects
- STTR Awards: 50 Phase I and 21 Phase II
- Phase II-E Awards: 31 SBIR/STTR Phase II-Es were awarded, leveraging $5.36 M funds from non-SBIR sources

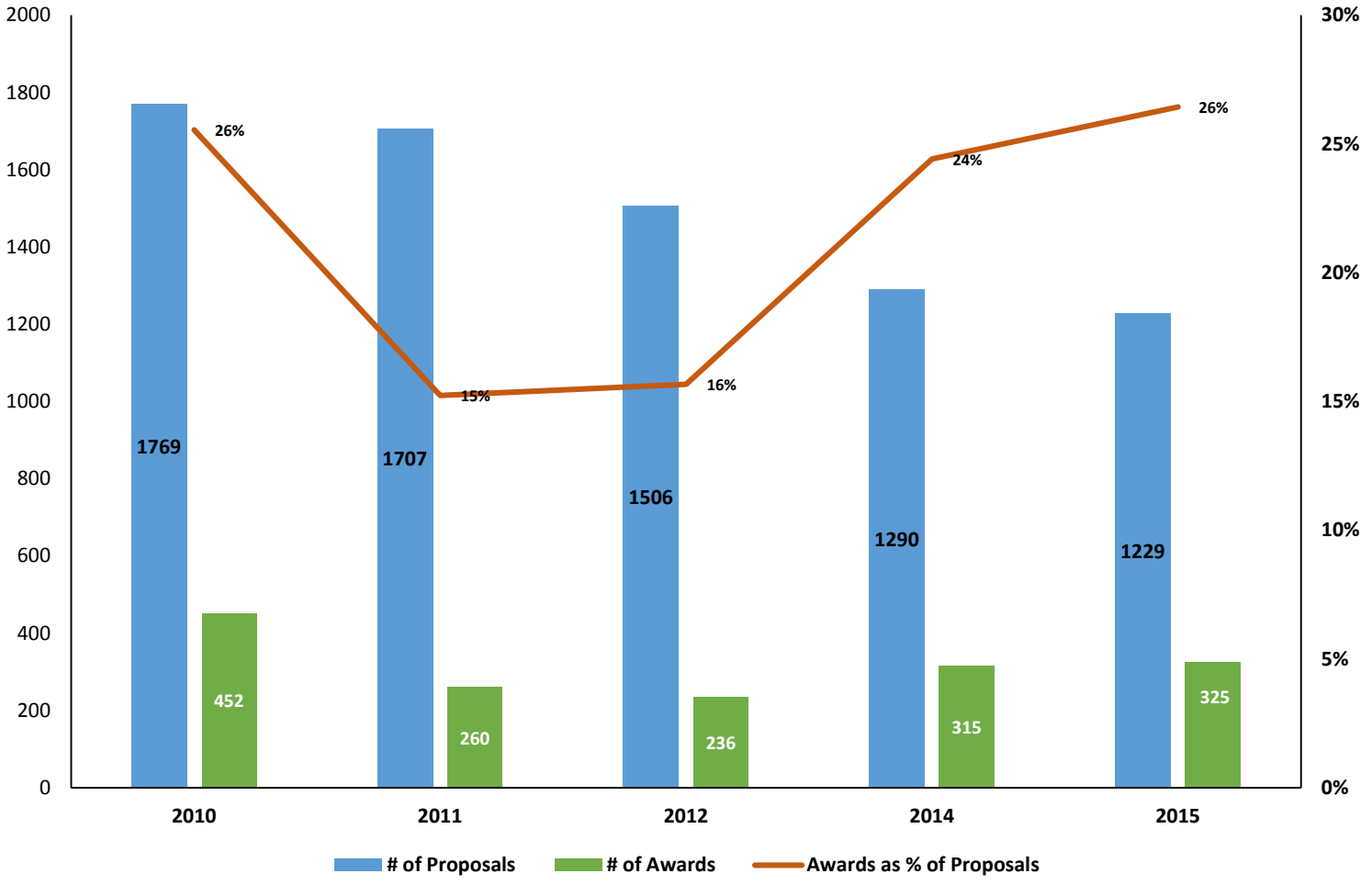
Participating Firms

FY 15 Phase I SBIR/STTR Awards



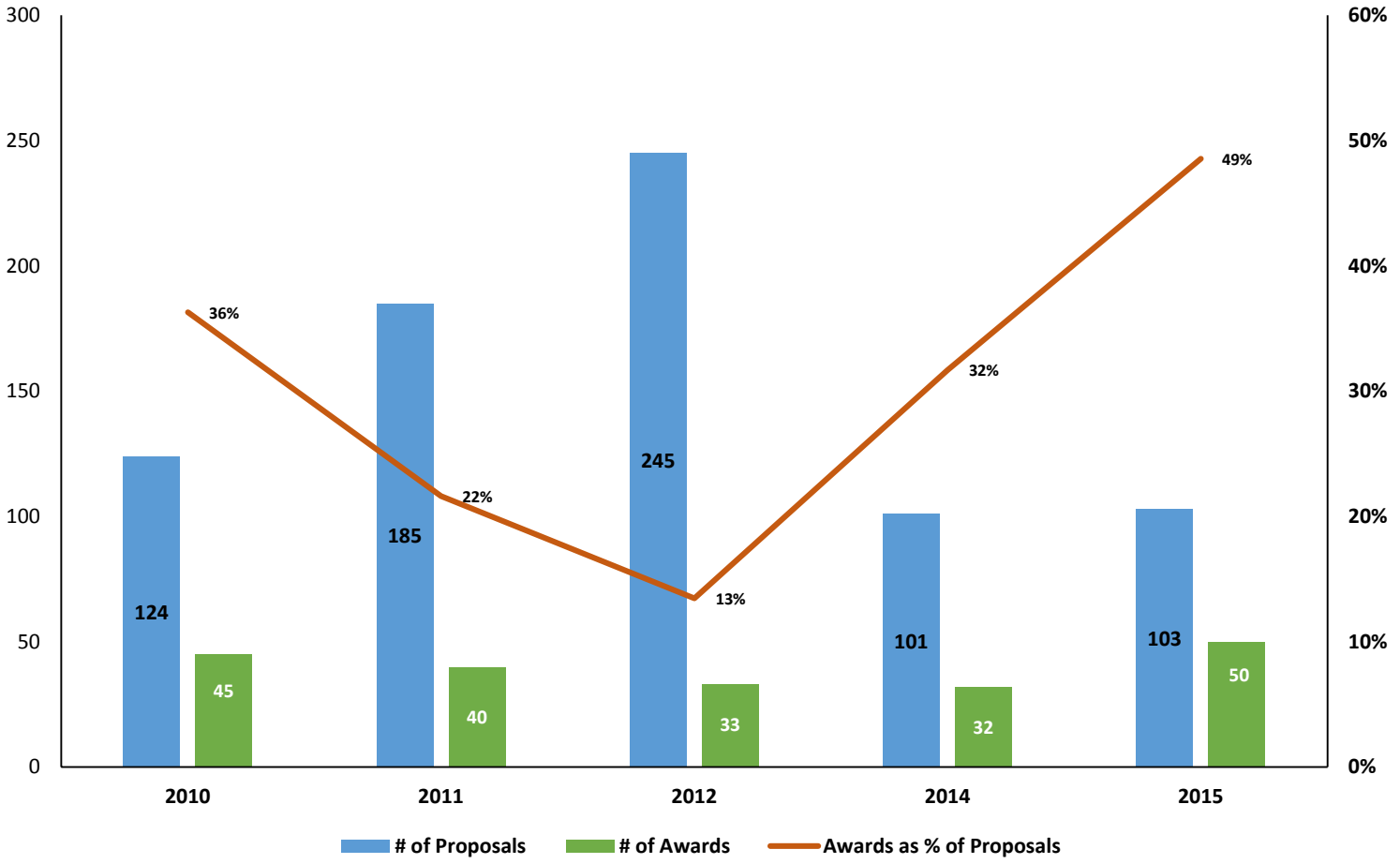
SBIR Proposals vs. Awards

Phase 1
Proposals vs. Awards for SBIR



STTR Proposals vs. Awards

Phase 1
Proposals vs. Awards for STTR



Understanding NASA's Needs

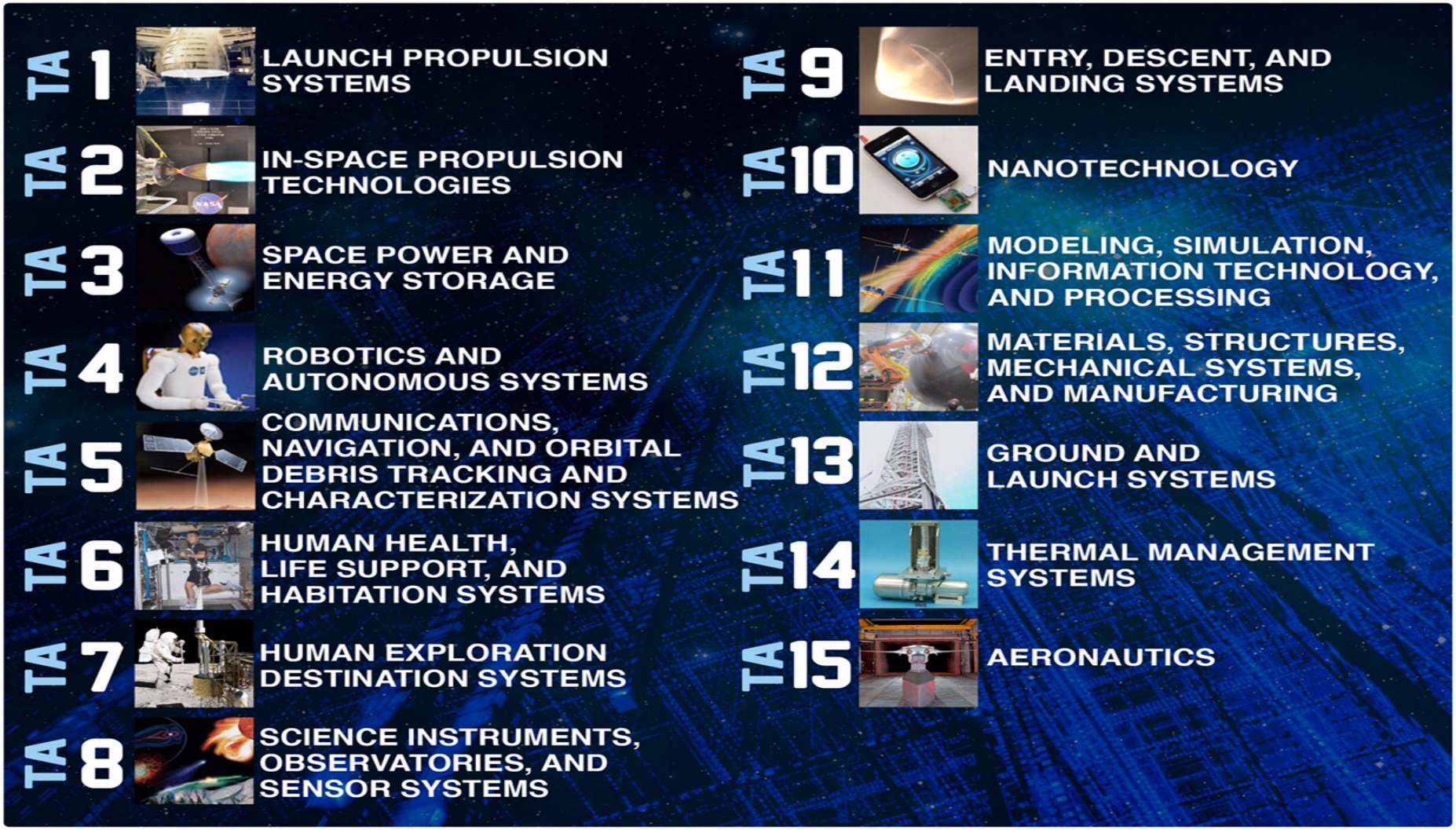
Know Your Customer

- Review last year's solicitation and review the titles and some abstracts of the winning proposals in your area of interest
- Draft Subtopics on the Web read, and comment on the text
- Talk to the people in your technical area who write subtopics and review proposals at the agency where you intend to submit your proposal
  - Find their technical emphasis, needs, and interest
  - Solve a sponsors problem
  - Align your technology/proposal to the sponsor's final needs

Suggest a Topic

- SBIR/STTR Subtopics are written for small business by researchers and managers
- Topics solicit innovative ideas to solve technical challenges
- Each topic is carefully reviewed each year
- SBIR/STTR Programs seek private sector input in selecting and refining potential topic areas for future SBIR and STTR solicitations

Space Technology Needs



Policies and Strategies :http://www.nasa.gov/directorates/spacetech/about_us/resources/index.html

Understanding Science Needs

- In Science – "Decadal Surveys" and NASA-developed implementation documents
  - Planetary Science
    - http://solarsystem.nasa.gov/multimedia/download-detail.cfm?DL_ID=742
  - Astronomy and Astrophysics
    - http://science.nasa.gov/astrophysics/special-events/astro2010-astronomy-and-astrophysics-decadal-survey/
    - Heliophysics (Solar and Space Physics)
    - http://www.nap.edu/catalog.php?record_id=13060
    - http://www.nasa.gov/mission_pages/sunearth/news/decadal-2012.html
    - http://science.nasa.gov/media/medialibrary/2010/03/31/Heliophysics_Roadmap_2009_tagged-quads.pdf
  - Earth Science
    - http://science.nasa.gov/earth-science/decadal-surveys/
    - http://esto.nasa.gov/

Understanding Human Exploration Needs

- In Human Exploration and Operations Mission Directorate
  - https://www.nasa.gov/sites/default/files/atoms/files/heomd2015goals.pdf
  - http://www.nasa.gov/sites/default/files/files/FY2014_NASA_SP_508c.pdf
- In Aeronautics Research
  - National Aeronautics R&D Plan
    - 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

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

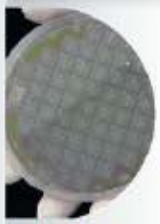
Creates future humanoid robotics, autonomy and remote operations technologies to substantially augments the capability of future human space flight missions.

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 exo-planets by direct observation and advances in the surface materials as well as control systems for large space optics.

SBIR & STTR Topic Areas

Small Business Innovation Research (SBIR)

Aeronautics Research Mission Directorate (ARMD)

- Topic A1 Aviation Safety
- Topic A2 Unmanned Aircraft Systems
- Topic A3 Air Vehicle Technology
- Topic A4 Ground and Flight Test Techniques and Measurement

Human Exploration and Operations Mission Directorate (HEOMD)

- Topic H1 In-Situ Resource Utilization
- Topic H2 Space Transportation
- Topic H3 Life Support and Habitation Systems
- Topic H4 Extra-Vehicular Activity Technology
- Topic H5 Lightweight Spacecraft Materials and Structures
- Topic H6 Autonomous & Robotic Systems
- Topic H7 Entry, Descent, and Landing Technologies
- Topic H8 High Efficiency Space Power Systems
- Topic H9 Space Communications and Navigation (SCaN)
- Topic H10 Ground Processing & ISS Utilization
- Topic H11 Radiation Protection
- Topic H12 Human Research and Health Maintenance
- Topic H13 Non-Destructive Evaluation

Science Operations (SMD)

- Topic S1 Sensors, Detectors and Instruments
- Topic S2 Advanced Telescope Systems
- Topic S3 Spacecraft and Platform Subsystems
- Topic S4 Robotic Exploration Technologies
- Topic S5 Information Technologies

Space Technology (STMD)

- Topic Z1 Space Technology for Cross-Cutting Applications Topic
- Topic Z2 Cross Cutting Advanced Manufacturing Processes for Large Scale Bulk Metallic Glass Systems for Aerospace Applications

Small Business Technology Transfer (STTR)

- Topic T1 Launch Propulsion Systems
- Topic T2 In-Space Propulsion Technologies
- Topic T3 Space Power and Energy Storage
- Topic T4 Robotics, Tele-Robotics and Autonomous Systems
- Topic T5 Communication and Navigation
- Topic T6 Human Health, Life Support and Habitation Systems
- Topic T7 Human Exploration Destination Systems
- Topic T8 Science Instruments, Observatories and Sensor Systems
- Topic T9 Entry, Descent and Landing Systems
- Topic T10 Nanotechnology
- Topic T11 Modeling, Simulation, Information Technology and Processing
- Topic T12 Materials, Structures, Mechanical Systems and Manufacturing
- Topic T13 Ground and Launch Systems Processing
- Topic T14 Thermal Management Systems
- Topic T15 Aeronautics

Proposal Evaluation

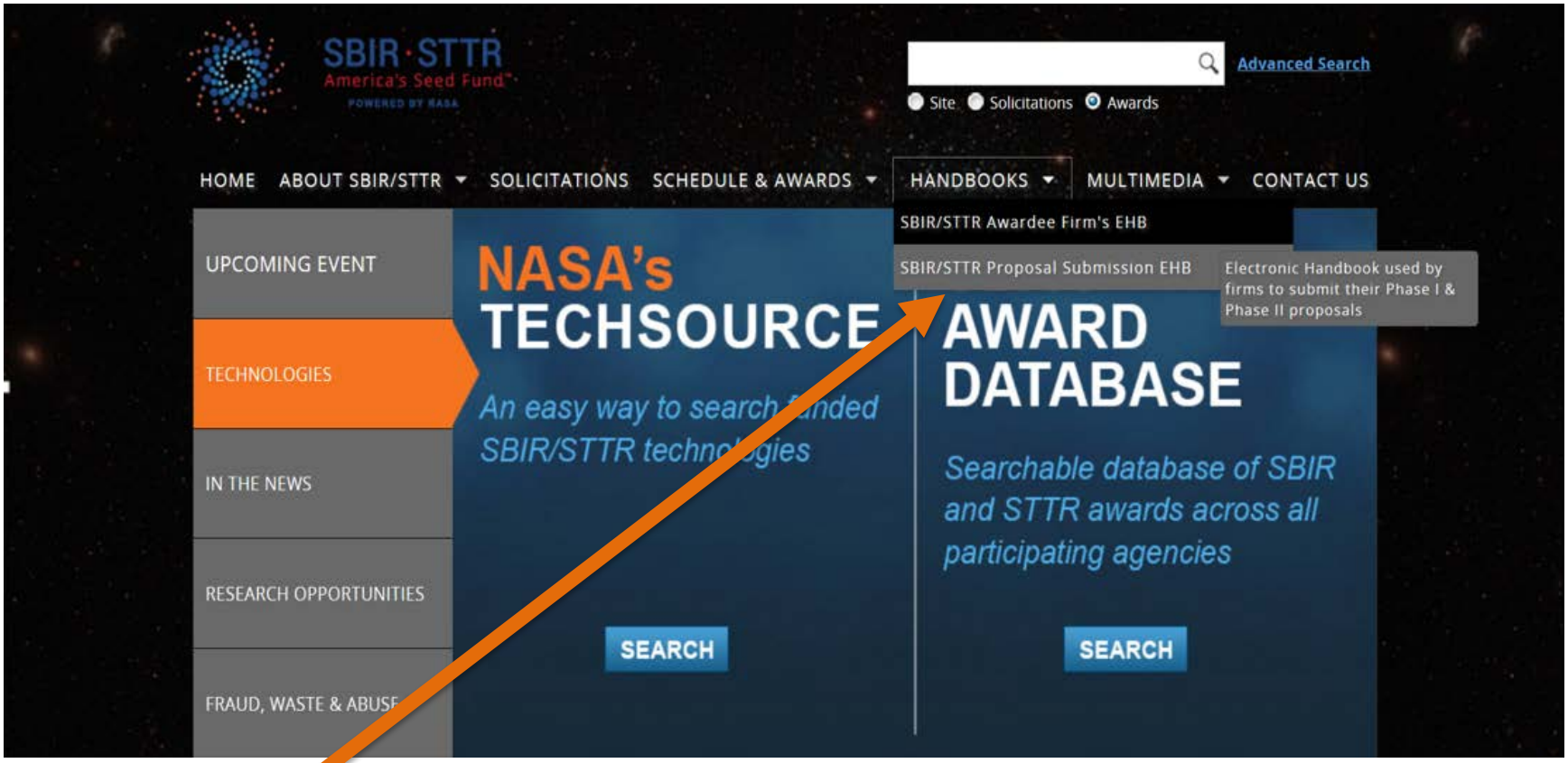
Proposals are evaluated on these factors:

1. Scientific/Technical Merit and Feasibility
2. Experience, Qualifications and Facilities
3. Effectiveness of the Proposed Work Plan
4. Commercial Potential and Feasibility
5. Price Reasonableness

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, phoneetc

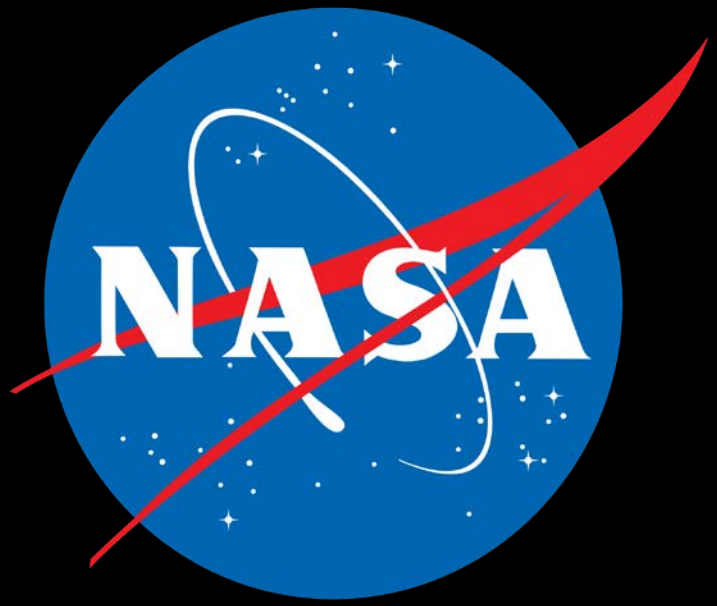
Proposal Submission



Click on 2nd link to submit Proposal and follow on-screen instructions

Contact NASA SBIR/STTR

www.sbir.nasa.gov



Dr. Joseph Grant
Deputy Program Executive

NASA Help Desk: 301.937.0888

Email: sbir@reisystems.com

Submission Process

Submission Requirements

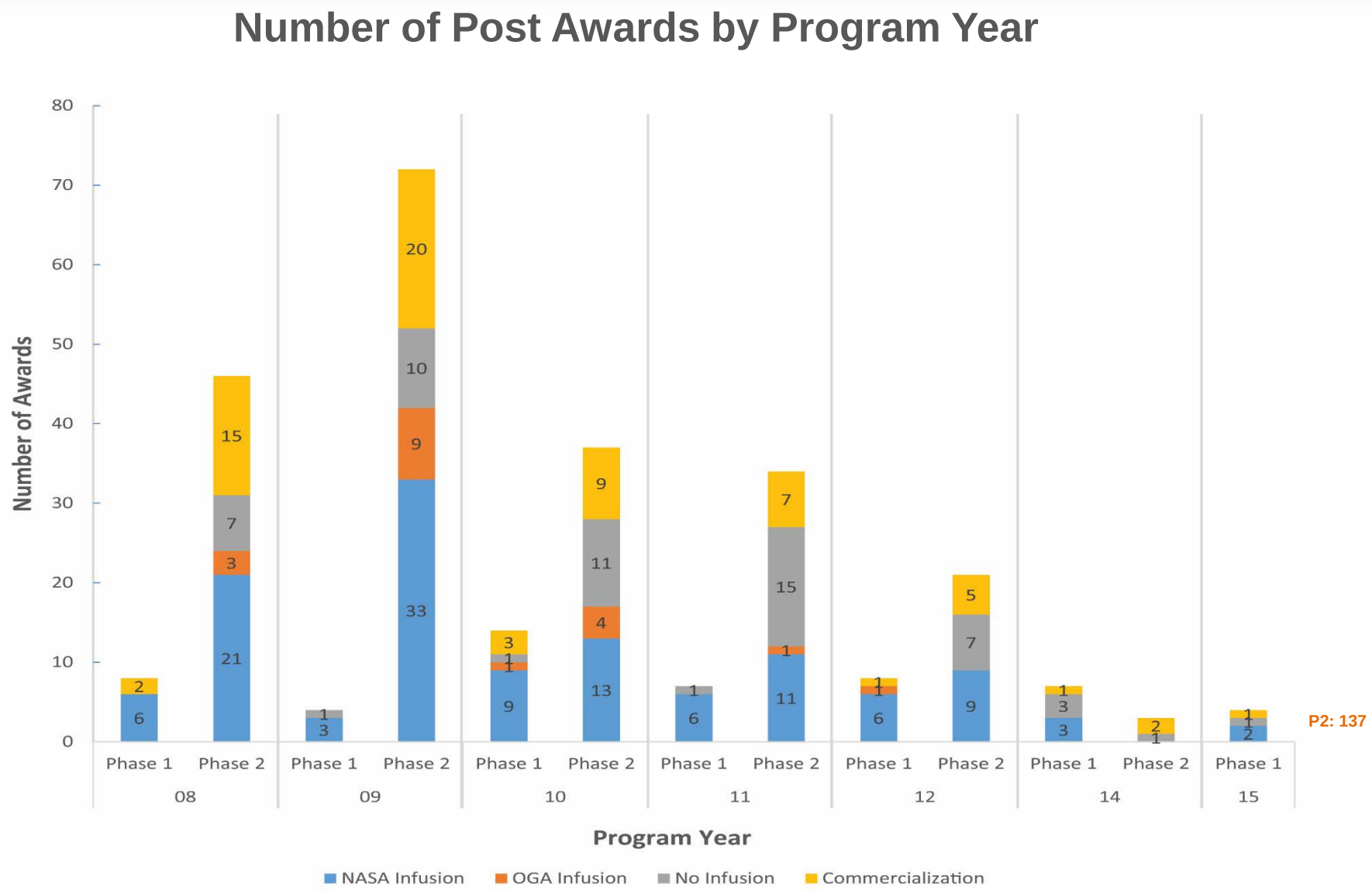
NASA uses electronically supported business processes for the SBIR/STTR programs. The firm must have Internet access and an e-mail address. Paper submissions are not accepted.

Link: http://sbir.nasa.gov

Submission Process

SBCs must register in the Electronic Handbook (EHB) to begin the submission process. The Proposal Submission EHB will guide the firms through the steps for submitting an SBIR/STTR proposal.

Types of Post Awards



P2: 137

Required Registrations

SBA Company Registry

- All applicants to the program are required to complete their registration at SBA's Company Registry prior to submitting an application.
  Link: https://www.sbir.gov/registration

NAICS Registration

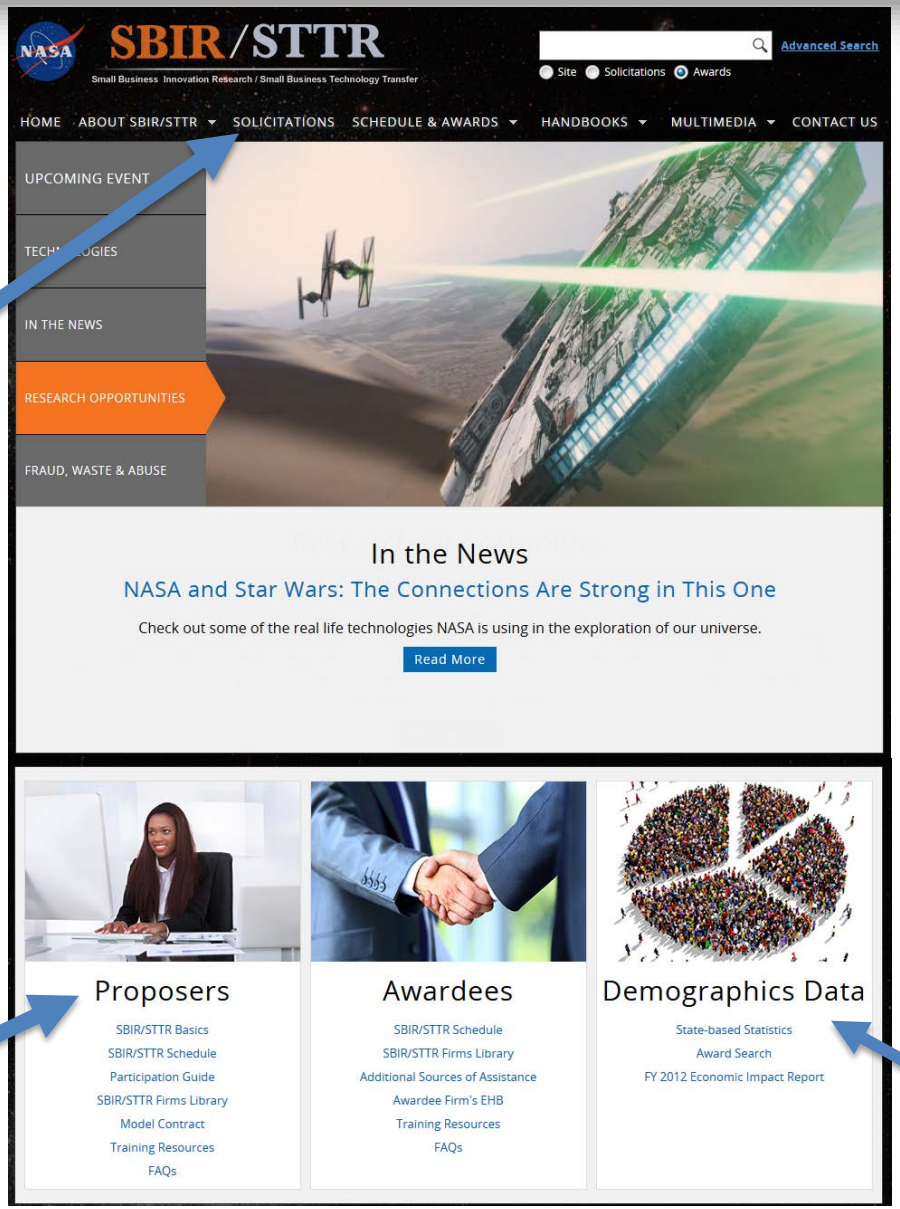
- SBIR/STTR firms are required to register under a *North American Industry Classification System* (*NAICS* code), which classifies the economic sector, industry and country of their business. Registration in SAM requires a NAICS code. To identify your firm's NAICS code(s), please visit www.census.gov/eos/www/naics.

SAM Registry

- To participate in the SBIR/STTR program, firms must register in the System for Award Management (SAM) database prior to proposal submission. For new firms, the registration process may take up to five business days to complete. Please visit www.sam.gov for more information and to register or update your registration.

SBIR/STTR Homepage

Access the PY 2016 Solicitations (Next release date November 2017)



Information for NEW firms available under "Proposers"

SBIR/STTR program analytics

Requirements for Contracting

5.1.2 Requirement for Contracting

To simplify making contract awards and to reduce processing time, all contractors selected for Phase I and Phase II contracts shall ensure that:

(1) All information in your proposal is current, e.g., your address has not changed, the proposed PI is the same, etc. If changes have occurred since submittal of your proposal, notify contracting officer immediately.

(2) Your firm is registered with System for Award Management (SAM).

(3) Your firm is in compliance with the VETS 100 requirement. Confirmation of that the report has been submitted to the Department of Labor is current shall be provided to the contracting officer within 10 business days of the notification of selection for negotiation.

(4) Your firm HAS NOT proposed a Co-Principal Investigator.

(5) STTR selectees should provide a copy of their executed Allocation of Rights Agreement to the contracting officer within 10 business days of receiving notification of selection for negotiation.

(6) Your firm is required to provide timely responses to all communications from the NSSC Contracting Officer.

(7) All proposed cost is supported with documentation such as a quote, previous purchase order, published price lists, etc. All letters of commitment are dated and signed by the appropriate person. If a University is proposed as a subcontractor or a RI, the signed letter shall be on the University letterhead from the Office of Sponsored Programs. If an independent consultant is proposed, the signed letter should not be on a University letterhead. If the use of Government facility or equipment is proposed, your firm shall submitted a signed letter from the Government facility stating the availability, cost if any, and authorizing the use of it, and a signed letter from your firm justifying the need to use the facility.

From the time of proposal notification of selection for negotiation, until the award of a contract, all communications shall be submitted electronically to NSSC-SBIR-STTR@nasa.gov.

SBA Firm Registry

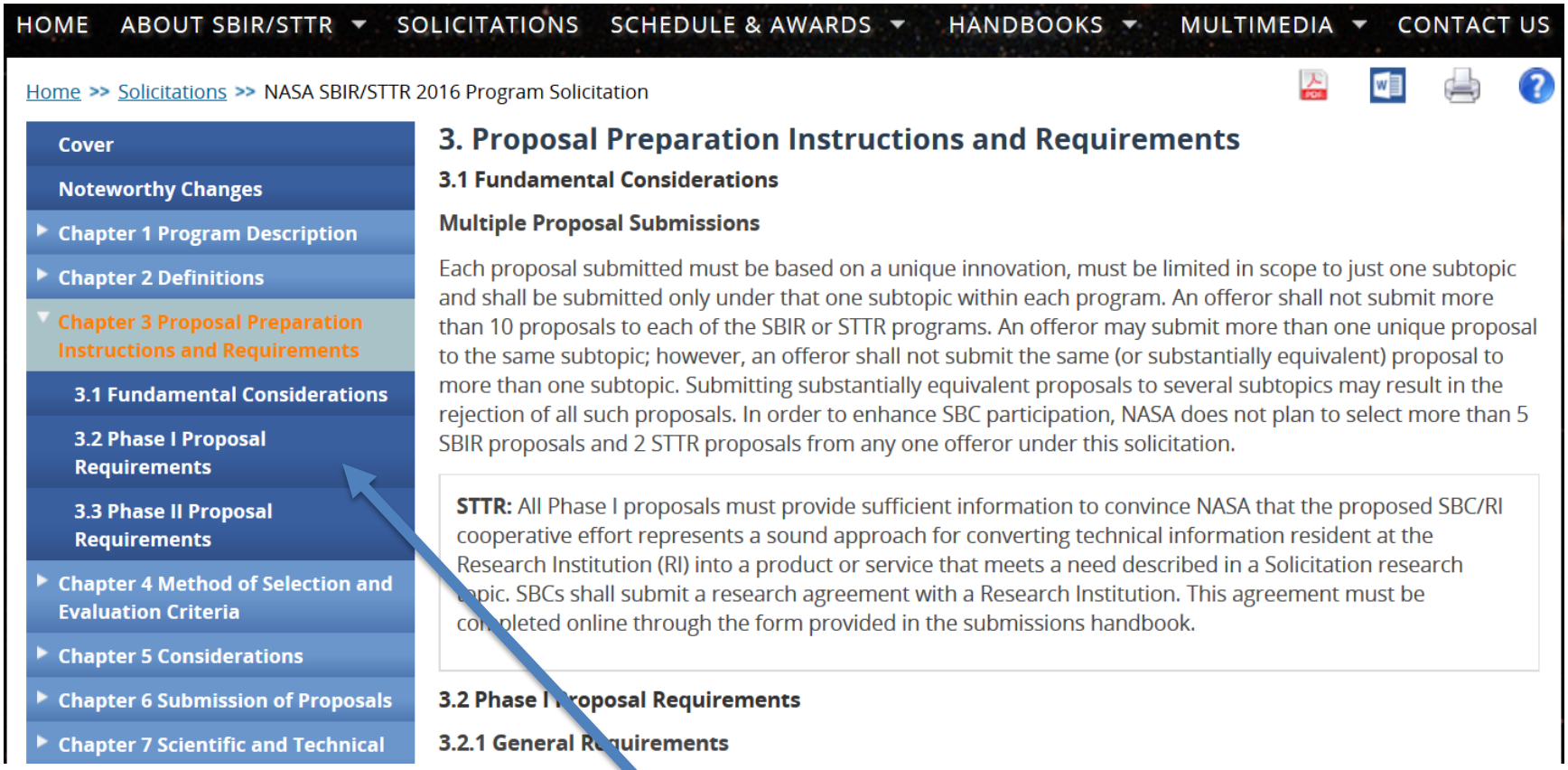
5.14 Required Registrations and Submissions

5.14.1 Firm SBA Firm Registry

SBA maintains and manages a Company Registry at (http://www.SBIR.gov) to track ownership and affiliation requirements for all companies applying to the SBIR Program. The SBIR policy directive requires each small business concern (SBC) applying for a Phase I or Phase II award to register in the Company Registry prior to submitting an application. A PDF document with the SBC registration information is available for download by the SBC upon successful registration. This PDF document must be saved by the SBC for inclusion in applications submitted to SBIR agencies. All SBCs must report and/or update ownership information to SBA prior to each SBIR application submission or if any information changes prior to award.

From the NASA SBIR/STTR Proposal Submission Electronic Handbook (EHB), the SBC must provide their unique SBC Control ID that gets assigned by SBA upon completion of the Company Registry registration, as well as upload the PDF document validating their registration. This information is submitted to NASA via a Firm level form in the Activity Worksheet and is applicable across all proposals submitted by the SBC for that specific solicitation.

Proposal Requirements



Click on 3.2 for Phase I Proposal Requirements

Reasons for Application Being Rejected

- ☐ **L**- Late Proposal(Sect. 6.3)
- ☐ **X**- Exceeds 25 Page Limit(Sect. 3.2.2)
- ☐ **F**- Font Size less than 10 Points(Sect. 3.2.2)
- ☐ **M**- Margins less than 1 inch(Margins less than 1 inch (Sect. 3.2.2))
- ☐ **D**- Duplicates/Similar Proposal(s)(Sect.3.1)

Duplicates Proposal(s)#:: _____ (format:xx.xx-xxxx eg:A1.01-0000)

- ☐ **W**- Withdrawn(Sect. 6.5)

Withdrawn Notice Date: _____ (format: mm/dd/yyyy eg: 07/30/2010)

- ☐ **N**- Incomplete Proposal: Form((Forms A, B, C, Firm Level Forms,Parts 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, Briefing Chart) (Sect.3.2.4))

(Please fill the missing parts in the box below): _____

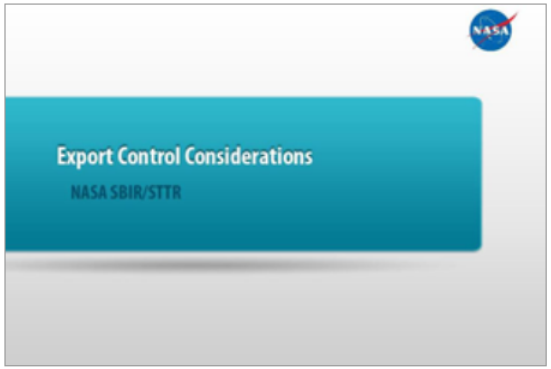
Fraud, Waste and Abuse

HOME | ABOUT SBIR/STTR | SOLICITATIONS | SCHEDULE & AWARDS | HANDBOOKS | MULTIMEDIA | CONTACT US

Home >> Training Resources

Training Resources

ITAR Training



This instructional ITAR training module familiarizes firms participating in the SBIR and STTR programs with ITAR and Export Control regulations.

Fraud, Waste, and Abuse Training

Recipients of an SBIR/STTR award are expected to report known cases of Fraud, Waste, and Abuse to the NASA Office of Inspector General (OIG). This training module defines fraud, waste, and abuse; provides examples of each; and gives instructions on what to do if you suspect fraudulent activity, waste, or abuse.

RELATED LINKS

- Solicitations
- Participation Guide
- Program Contacts
- Sources of Assistance
- FAQs

Click on Multimedia →Training Resources →FWA Training