



# Overview of the SBIR & STTR Programs

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# Congressional Objectives

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- **Stimulate technological innovation**
- **Use small business to meet federal R&D needs**
- **Foster and encourage participation by minorities and disadvantaged persons in technological innovation**
- **Increase private-sector commercialization innovations derived from federal R&D**



# Why Participate in SBIR/STTR?

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



# SBIR/STTR: 3-Phase Program

- **Phase 1**

- Feasibility study
- \$100K award
- 6 months duration (SBIR)
- 12 months duration (STTR)

SBIR	FY03	FY04	FY05	FY06	FY07
Millions of \$	107.3	107.5	110.0	105.6	106.6
Phase 1 Awards	267	312	291	267	259
Phase 2 Awards	155	139	142	186	130

- **Phase 2**

- Technology Development
- 2-Year Award
- \$600K (SBIR/STTR)

STTR	FY03	FY04	FY05	FY06	FY07
Millions of \$	6.4	12.9	13.2	12.3	12.8
Phase 1 Awards	45	40	35	27	25
Phase 2 Awards	18	26	17	22	18

SBIR is 2.5% of extramural R&D, STTR is 0.3% of extramural R&D.

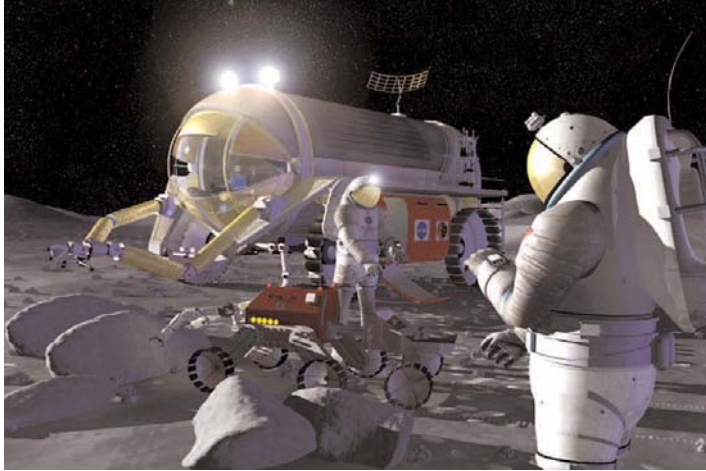
- **Phase 3**

- Technology Infusion/Commercialization Stage
- Use of non-SBIR Funds
- Ability to award sole-source contracts without Justification for Full and Open Competition (JOFOC) based on specific SBIR authority – NASA and NASA primes.

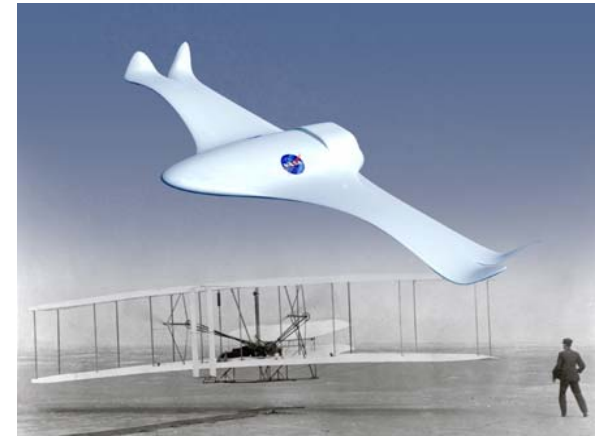


# Solicitations Support the Technology Needs of NASA Mission Directorates

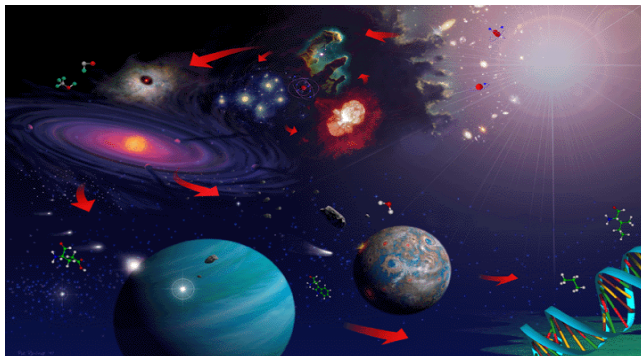
## Exploration Systems



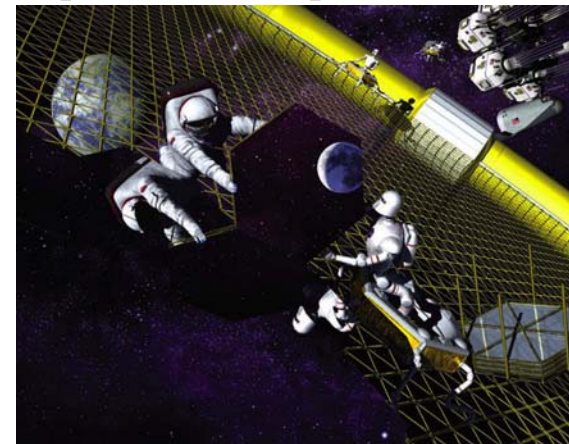
## Aeronautics Research



## Science



## Space Operations





# NASA Strategic Approach

**Ultimate objective is to achieve infusion of critical technologies into NASA's Mission Directorates**

- flight programs/projects
- ground or test systems
- or other uses to advance NASA's mission

**Every technology development investment dollar is critical to the ultimate success of NASA's mission. Therefore SBIR strategy is to:**

- Ensure alignment and integration with Mission Directorate priorities
- Ensure investments are complementary with technologies being pursued by
  - Mission Directorate programs and projects
  - prime contractors
  - other agency SBIR/STTR investments

**Accordingly, Mission Directorates establish high priority needs and identify existing gaps**

- High priority needs are developed into topics for the annual solicitation
- Subtopics may be clustered to support the development and maturation of critical technologies for infusion into NASA projects



# NASA Mission Directorate Interests

## Aeronautics Research Mission Directorate

( [www.aeronautics.nasa.gov](http://www.aeronautics.nasa.gov) )

- **Aviation Safety and Security**
- **Vehicle Systems**
- **Airspace Systems**
- **Aeronautics Test Technology**

## Exploration Systems Mission Directorate

( [www.exploration.nasa.gov](http://www.exploration.nasa.gov) )

- **Moon Initiative Technology Support**
- **Power**
- **Propulsion**
- **Biological Sciences**



# NASA Mission Directorate Interests

## Science Mission Directorate

([www.science.hq.nasa.gov](http://www.science.hq.nasa.gov))

- **Earth Science**
- **Solar System Exploration**
- **Telescopes**
- **Sensors and Detectors**
- **Helioscience**
- **Spacecraft Technologies**

## Space Operations Mission Directorate

([www.hq.nasa.gov/osf](http://www.hq.nasa.gov/osf))

- **Communications**
- **Operations**



# SBIR/STTR Program Focus on Infusion

- 10 Infusion-focused offices
- 4 Primary Admin Offices
- Alignment with MD objectives
- Decision Support for MDs on technology gaps & priorities
- Cross cutting areas that involve multiple MDs assigned to single office
- Technology Infusion Managers at all Centers
- Technology Readiness Level (TRL) now being tracked as part of SBIR/STTR

<b>SBIR Primary Offices</b>	<b>Mission Directorate Focus</b>	<b>Cross Cutting Programs</b>
<b>Glenn Research Center</b>	<b>ARMD</b>	<b>• Comm</b>
<b>Langley Research Center</b>	<b>ESMD</b>	
<b>Jet Propulsion Laboratory</b>	<b>SMD</b>	
<b>Ames Research Center</b>	<b>SOMD</b>	<b>• SmallSats • Human Life Sciences</b>



# SBIR/STTR Administrative Points of Contact (By Mission Directorate)

## **Aeronautics Research Mission Directorate**

**Glenn Research Center** - Aeropropulsion and communications technologies  
**Gynelle Steele**, 216-433-8258, [Gynelle.C.Steele@nasa.gov](mailto:Gynelle.C.Steele@nasa.gov)

## **Exploration Systems Mission Directorate**

**Langley Research Center** - Aviation and space research  
**Bob Yang**, 757-864-8020, [Robert.L.Yang@nasa.gov](mailto:Robert.L.Yang@nasa.gov)

## **Science Mission Directorate**

**Jet Propulsion Laboratory** - Robotic exploration of the solar system  
**Andrew Gray**, 818-354-4906, [Andrew.A.Gray@jpl.nasa.gov](mailto:Andrew.A.Gray@jpl.nasa.gov)

## **Space Operations Mission Directorate**

**Ames Research Center** - Research of new technologies  
**Dr. Rich Pisarski**, 650-604-0149, [Ryszard.L.Pisarski@nasa.gov](mailto:Ryszard.L.Pisarski@nasa.gov)



# SBIR/STTR Technical Information Points of Contact (SBIR Technology Integration/Infusion Managers)

[Ames Research Center](#) - Research of new technologies

**Kim Hines**, 650-604-5582, [kimberly.k.hines@nasa.gov](mailto:kimberly.k.hines@nasa.gov)

[Dryden Flight Research Center](#) - Flight research

**Laguduva Kubendran**, 661-276-2989, [Laguduva.R.Kubendran@nasa.gov](mailto:Laguduva.R.Kubendran@nasa.gov)

[Glenn Research Center](#) - Aeropropulsion and communications technologies

**Marla Perez-Davis**, 216-433-6755, [Marla.E.Perez-Davis@nasa.gov](mailto:Marla.E.Perez-Davis@nasa.gov)

**James Stegeman**, 216-433-3389, [James.D.Stegeman@nasa.gov](mailto:James.D.Stegeman@nasa.gov)

[Goddard Space Flight Center](#) - Earth, the solar system, and Universe observations

**Dr. Jim Chern**, 301-286-5836, [Jim.Chern@nasa.gov](mailto:Jim.Chern@nasa.gov)

[Jet Propulsion Laboratory](#) - Robotic exploration of the solar system

**Andrew Gray**, 818-354-4906, [Andrew.A.Gray@jpl.nasa.gov](mailto:Andrew.A.Gray@jpl.nasa.gov)

[Johnson Space Center](#) - Human space exploration

**Kevin Lee**, 281-483-5013, [Kevin.W.Lee@nasa.gov](mailto:Kevin.W.Lee@nasa.gov)

[Kennedy Space Flight Center](#) - Prepare and launch missions around the Earth and beyond

**Joni Richards**, 321-867-2225, [Joni.M.Richards@nasa.gov](mailto:Joni.M.Richards@nasa.gov)

[Langley Research Center](#) - Aviation and space research

**Kimberly Graupner**, 757-864- 8618, [Kimberly.Graupner@nasa.gov](mailto:Kimberly.Graupner@nasa.gov)

[Marshall Space Flight Center](#) - Space transportation and propulsion technologies

**Lynn Garrison**, 256-544-6719, [Virginia.B.Garrison@nasa.gov](mailto:Virginia.B.Garrison@nasa.gov)

[Stennis Space Center](#) - Rocket propulsion testing and remote sensing technology

**Ray Bryant**, 228-688-3964, [James.R.Bryant@nasa.gov](mailto:James.R.Bryant@nasa.gov)

Visit <http://sbir.nasa.gov/SBIR/pgminfo.htm#office> for the latest program contact information



# NASA FY07 Solicitation

## Aeronautics Mission Directorate

### TOPIC A1 Aviation Safety

A1.01 Mitigation of Aircraft Aging and Durability-related Hazards

A1.02 Crew Systems Technologies for Improved Aviation Safety

A1.03 Aviation External Hazard Sensor Technologies

A1.04 Adaptive Flight Control

A1.05 Data Mining for Integrated Vehicle Health Management

A1.06 Sensing and Diagnostic Capability

A1.07 Advanced Health Management for Aircraft Subsystems

A1.08 Prediction of Aging Effects

A1.09 Integrated Avionics Systems for Small Scale Remotely Operated Vehicles

A1.10 Adaptive Structural Mode Suppression

A1.11 Universal Enabling IVHM Technologies in Architecture, System Integration, Databases, and Verification and Validation

A1.12 Technologies for Improvement Design and Analysis of Flight Deck Automation

A1.13 On-Board Flight Envelope Estimation for Unimpaired and Impaired Aircraft



# NASA FY07 Solicitation

## Aeronautics Mission Directorate

### TOPIC A2 Fundamental Aeronautics

- A2.01 Materials and Structures for Future Aircraft
- A2.02 Combustion for Aerospace Vehicles
- A2.03 Aero-Acoustics
- A2.04 Aeroelasticity
- A2.05 Aerodynamics
- A2.06 Aerothermodynamics
- A2.07 Flight and Propulsion Control and Dynamics
- A2.08 Experimental Capabilities and Flight Research
- A2.09 Aircraft Systems Analysis, Design and Optimization
- A2.10 Rotorcraft

### TOPIC A3 Airspace Systems

- A3.01 Next Generation Air Transportation System - Airspace
- A3.02 Next Generation Air Transportation - Airportal

### TOPIC A4 Aeronautics Test Technologies

- A4.01 Test Measurement Technology
- A4.02 Test Techniques and Facility Development



# Aeronautics Research Mission Directorate

## Fundamental Aeronautics

- **Subsonic: Fixed Wing** – Research emphasis is on developing technologies for improving performance (reduced fuel burn), reducing noise, and reducing emissions for subsonic aircraft. A major product will be fast and effective physics based multi-disciplinary analysis and design tools with quantified levels of uncertainty that enable virtual expeditions through the design space for conventional and unconventional vehicles.
- **Subsonic: Rotary Wing** - Physics-based multi-disciplinary analysis and design tools and technologies that enable increased civil competitiveness of rotorcraft, including improved efficiency, productivity, and environmental acceptance.
- **Supersonics** – Tools and technology for the supersonic flight regime including: highly efficient airframes and engines, light weight and durable material and structures for high temperature, sonic boom modeling, airport noise, high altitude emissions, aeroservoelasticity, entry/descent/landing in planetary atmospheres, and integrated systems for multidisciplinary design and analysis.
- **Hypersonics** – Development of physics-based multi-disciplinary analysis and design optimization predictive capabilities, incorporating uncertainties. Highly Reliable Reusable Launch Systems (HRRLS) and High Mass Mars Entry Systems (HMMES) have been chosen to focus technology and methods development efforts.

## Aviation Safety Program

- **Integrated Vehicle Health Management** – Airframe health management; propulsion health management; environmental health management; system architectural framework; validation and predictive capability assessment
- **Integrated Intelligent Flight Deck** – Tailored flexible operator-automation management; adaptive displays and interaction; decision associate technology; intelligent information management
- **Integrated Resilient Aircraft Control** – Resilient flight control; resilient propulsion control; resilient airframe control; resilient vehicle mission management; safety-critical systems V&V
- **Aircraft Aging & Durability** – Detection and characterization of aging related hazards; prediction of life, strength and durability of systems with degradation; Mitigation of aging related hazards

## Airspace Systems

- **Next Generation Air Transportation System (NGATS): Airspace** – Adaptive air/ground automation concepts & technologies; airspace modeling and simulation; systems analysis and integration; experimental and validation
- **NGATS: Airportal** – Adaptive air/ground automation concepts & technologies; airportal modeling and simulation; system analysis and integration; experimentation and validation

## Aeronautics Test Program

- **Test Technology Development** – Aeronautics test technology for wind tunnels and aeropropulsion test facilities that improves data quality, facility productivity, facility cost, test capability, and integration with computational.
- **University Research** - Provide experience to graduate students in the use of large aeronautics test facilities while carrying out valuable aeronautics research.



# NASA FY07 Solicitation

## Exploration Mission Directorate

### TOPIC X1 Avionics and Software

- X1.01 Automation for Vehicle and Habitat Operations
- X1.02 Reliable Software for Exploration Systems
- X1.03 Radiation Hardened/Tolerant and Low Temperature Electronics and Processors
- X1.04 Integrated System Health Management

### TOPIC X2 Sensors for Autonomous Systems

- X2.01 Autonomous Rendezvous and Docking Sensors
- X2.02 Autonomous Precision Landing and Hazard Detection and Avoidance

### TOPIC X3 Environmental Control and Life Support (ECLS)

- X3.01 Spacecraft Cabin Atmospheric Resource Management and Particulate Matter Removal
- X3.02 Water Processing and Waste Management Systems
- X3.03 Spacecraft Cabin Environmental Monitoring and Control
- X3.04 Spacecraft Fire Protection

### TOPIC X4 Extra Vehicular Activity (EVA)

- X4.01 Space Suit Pressure Garment and Airlock Technologies
- X4.02 Space Suit Life Support Systems
- X4.03 Space Suit Displays, Cameras, Controls, and Integrated Systems



# NASA FY07 Solicitation

## Exploration Mission Directorate

### TOPIC X5 Lunar In Situ Resource Utilization (ISRU)

- X5.01 Oxygen Production from Lunar Regolith
- X5.02 Lunar Regolith Excavation and Material Handling
- X5.03 Lunar Volatile Resource Prospecting and Collection

### TOPIC X6 Structures, Materials and Mechanisms

- X6.01 Lightweight Structures
- X6.02 Low Temperature Mechanisms
- X6.03 Advanced Radiation Shielding Materials
- X6.04 Advanced Composite Materials

### TOPIC X7 Lunar Operations

- X7.01 Supportability
- X7.02 Human Systems Interaction
- X7.03 Surface Mobility and Transportation
- X7.04 Surface System Dust Mitigation

### TOPIC X8 Energy Generation and Storage

- X8.01 Fuel Cells for Surface Systems
- X8.02 Advanced Space Rated Batteries
- X8.03 Nuclear Surface Power
- X8.01 Fuel Cells for Surface Systems
- X8.02 Advanced Space Rated Batteries
- X8.03 Nuclear Surface Power



# NASA FY07 Solicitation

## Exploration Mission Directorate

### TOPIC X9 Propulsion and Cryogenic Systems

X9.01 Cryogenic Propellant Storage and Distribution for Space Exploration Applications

X9.02 Cryogenic Propellant Mass Gauging and Liquid Acquisition for Low Gravity Applications

X9.03 Cryogenic and Non-Toxic Storable Propellant Space Engines

X9.04 Launch Vehicle Propulsion and Pyrotechnic Technologies

### TOPIC X10 Protection Systems

X10.01 Detachable, Human-rated, Ablative Environmentally Compliant TPS

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X10.01 Detachable, Human-rated, Ablative Environmentally Compliant TPS

### TOPIC X11 Thermal Management

X11.01 Thermal Control for Surface Systems and Spacecraft

### TOPIC X12 Exploration Crew Health Capabilities

X12.01 Health Preservation in the Space Environment

X12.02 Crew Exercise Systems

X12.03 Exploration Medical Capability



# NASA FY07 Solicitation

## Exploration Mission Directorate

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### TOPIC X13 Space Human Factors and Food Systems

**X13.01 Space Human Factors Assessment Tools**

**X13.02 Advanced Food Technologies**

### TOPIC X14 Space Radiation

**X14.01 Small Personal Dosimetry**

**X14.02 Charged Particle Spectroscopy**

**X14.03 Neutron Spectroscopy**



# Exploration Systems Mission Directorate

- **Structures, Materials, and Mechanisms** – Lightweight composite structures for vehicles and habitats, lightweight tanks for cryogenic propellants, inflatable structures for the lunar surface, multifunctional materials, and low-temperature mechanisms.
- **Protection** – Ablative, human-rated thermal protection system materials, lightweight radiation shielding, dust and contaminant mitigation.
- **Propulsion and Cryogenics** – Main engines and reaction control system thrusters for the Lunar Lander, and cryogenic propellant storage systems.
- **Thermal Control** – Advanced radiators, heat pumps, sublimators, and evaporators for thermal control of vehicles, habitats, and EVA suits.
- **Power** – Lithium-ion and lithium-sulfur batteries, regenerative fuel cells, and technologies for solar and nuclear surface power systems.
- **Avionics & Software** - Radiation hardened and low-temperature electronics, low-power high performance processors, integrated systems health management, automated rendezvous and docking sensors, autonomous precision landing, catastrophic event flight data recorders, reliable software development tools.
- **Communications** – Smart telemetry systems, adaptive S-Band transponders and antennas.
- **Environmental Control & Life Support** – Atmospheric management, environmental monitoring and control, advanced air and water recovery systems, fire detection and suppression.
- **Crew Support & Accommodations** – Technologies for advanced EVA surface suits, including life support, power, thermal control, flexible displays, and materials; crew health care systems; habitability systems.
- **In-Situ Resource Utilization** – Regolith excavation and material handling, oxygen production from regolith, polar volatile collection and separation.
- **Robotics and Operations** – Advanced robotic systems for lunar outpost assembly and maintenance, surface mobility systems, human-system interaction, and supportability technologies such as electronics/wiring inspection and repair.

\*\* It is recommended that the Technology Projects should focus on the delivery of products that can be incorporated into ground-based demonstrations of systems and operational scenarios in analog environments.



# NASA FY07 Solicitation

## Science Mission Directorate

### TOPIC S1 Sensors, Detectors, and Instruments

S1.01 Lidar System Components

S1.02 Active Microwave Technologies

S1.03 Passive Microwave Technologies

S1.04 Sensor and Detector Technology for Visible, IR, Far IR and Submillimeter

S1.05 Detector Technologies for UV, X-Ray, Gamma-Ray and Cosmic-Ray Instruments

S1.06 Particles and Field Sensors and Instrument Enabling Technologies

S1.07 Cryogenic Systems for Sensors and Detectors

S1.08 In Situ Airborne, Surface, and Submersible Instruments for Earth Science

S1.09 In Situ Sensors and Sensor Systems for Planetary Science

### TOPIC S2 Advanced Telescope Systems

S2.01 Precision Spacecraft Formations for Telescope Systems

S2.02 Proximity Glare Suppression for Astronomical Coronagraphy

S2.03 Precision Deployable Optical Structures and Metrology

S2.04 Optical Devices for Starlight Detection and Wavefront Analysis

S2.05 Optics Manufacturing and Metrology for Telescope Optical Surfaces



# NASA FY07 Solicitation

## Science Mission Directorate

### TOPIC S3 Spacecraft and Platform Subsystems

- S3.01 Avionics and Electronics**
- S3.02 Thermal Control Systems**
- S3.03 Power Generation and Storage**
- S3.04 Propulsion Systems**
- S3.05 Terrestrial Balloon Technology**

### TOPIC S4 Low-Cost Small Spacecraft and Technologies

- S4.01 NanoSat Launch Vehicle Technologies**
- S4.02 Secondary and Tertiary Launch Technologies**
- S4.03 Low-Cost, Rapid Spacecraft Design and Multi-Subsystem Functionality**
- S4.04 Project Management, Systems Engineering and Mission Assurance Tools**
- S4.05 Smart, Autonomous Command and Data Handling System, Algorithms and Data Management**
- S4.06 Advanced Avionics**
- S4.07 Mini-Micro Thrusters, LOX / Hydrocarbon Propulsion, and Attitude Control Systems**
- S4.08 Low-cost Assembly, Integration, and Testing**
- S4.09 Autonomous Multi-Mission Virtual Ground and Spacecraft Operations**



# NASA FY07 Solicitation

## Science Mission Directorate

### TOPIC S5 Robotic Exploration Technologies

- S5.01 Extreme Environments Technology
- S5.02 Planetary Entry, Descent and Landing Technology
- S5.03 Sample Collection, Processing, and Handling Devices
- S5.04 Surface and Subsurface Robotic Exploration
- S5.05 Planetary Balloons and Aerobots

### TOPIC S6 Information Technologies

- S6.01 Modeling, Simulation and Analysis Technologies
- S6.02 Technologies for Large-Scale Numerical Simulation
- S6.03 On-Board Data Processing and Control
- S6.04 Data Analyzing and Processing Algorithms
- S6.05 Data Management - Storage, Mining and Visualization
- S6.06 Spatial and Visual Methods for Search, Analysis and Display of Science Data



# Science Mission Directorate

- **New Remote Sensing Technologies** – to better see, detect, and measure the Earth, the sun, the solar system, and the universe
- **Large, Lower Cost, Lightweight Mirrors and Space-Deployable Structures** – for the next generation of large telescopes and antennas
- **Novel Platforms** – including power and propulsion technologies, that can take instruments to new vantage points
- **Intelligent Distributed Systems** – that enable advanced communications, efficient data processing and transfer, and autonomous operations of land- and space-based assets
- **Information Synthesis** – to derive useful knowledge from extremely large data sets through visualization, advanced simulations, analysis, and seamlessly linked models

**Note: It is recommended that the Technology Projects focus on the delivery of products that can be incorporated into airborne and/or ground-based demonstrations.**



# NASA FY07 Solicitation

## Space Operations Mission Directorate

### TOPIC O1 Space Communications and Navigation

- O1.01 Coding, Modulation, and Compression
- O1.02 Precision Spacecraft and Lunar/Planetary Surface Navigation and Tracking
- O1.03 Communication for Space-Based Range
- O1.04 Antenna Technology
- O1.05 Reconfigurable/Reprogrammable Communication Systems
- O1.06 Miniaturized Digital EVA Radio
- O1.07 Transformational Communications Technology
- O1.08 Long Range Optical Telecommunications
- O1.09 Long Range Space RF Telecommunications
- O1.10 Surface Networks and Orbit Access Links
- O1.11 Software for Space Communications Infrastructure Operations

### TOPIC O2 Space Transportation

- O2.01 Optical Tracking and Image Analysis
- O2.02 Space Transportation Propulsion System and Test Facility Requirements and Instrumentation
- O2.03 Automated Collection and Transfer of Launch Range Surveillance/Intrusion Data

### TOPIC O3 Processing and Operations

- O3.01 Crew Health and Safety Including Medical Operations
- O3.02 In-helmet Speech Audio Systems and Technologies
- O3.03 Vehicle Integration and Ground Processing
- O3.04 Mission Operations



# Space Operations Mission Directorate

- **Space Communications** – Optical communications, spacecraft RF including antennas and ground based Earth stations, surface networks, access links, navigation and timing, reprogrammable communications systems, communications systems for EVAs, advanced antenna technology and transmit array concepts, communications in support of launch services; novel operational projects that have a high return-on-investment; proposed project should be aligned with the Space Communications and Navigation Architecture as being developed by the agency.
- **Space Transportation** – Technologies to enable a safer and more reliable space transportation capability including automated collection of range data, automated tracking and identification of objects, instrumentation for space transportation system testing, integrated system health monitoring for ground support equipment, facilities, and ground/spacecraft system interfaces, and technologies that reduce the cost of ground operations including new and innovative technology solutions for assembly, test, integration and processing of spacecraft; end-to-end launch services; specifically corrosion prevention, detection, and mitigation of corrosion in spaceport facilities and ground support equipment; non-destructive evaluation / non-intrusive inspection technologies; and operationally effective propellant loading, servicing, and storage.
- **Space Operation** – Technologies that optimize crew health and performance using innovative technologies for procedure management of crew medical officer responses to in-flight medical issues, technologies that optimize the performance of ground operations, technologies that enable innovative use of operational assets for flight testing of developmental hardware and software.



# SBIR Program Eligibility Checkpoints

- U.S. small business, organized for-profit
- At least 51% U.S. owned and independently operated
- Business must be located in the U.S.
- P.I.'s primary employment is with the small business during the project.



# How to Win

- Start early and do your homework
- Review last year's solicitation along with the titles and abstracts of the winning proposals in your area of interest
- Talk to the NASA POCs in your technical area:
  - Find technical emphasis, needs, and interest
  - Align your technology/proposal to meet the need
- Prepare your proposal in accordance with the solicitation instructions or your proposal may be rejected administratively. Note that each Agency's administrative requirements may differ.
- Address all areas that will be scored in the evaluation
- Don't underestimate the importance of commercialization
- Lay out the evaluation criteria and write to satisfy the reviewers
- Don't pad the proposal to get to the 25 page limit



## How to Win

- Don't subcontract Government facilities or equipment with SBIR funds
- Comply with Conflict of Interest rules
- If appropriate, form a team with universities or other companies
- Get advice from your local small business advisory resources
- Get an independent review of your proposal prior to submission
- Submit your proposal electronically prior to the final 24 hour rush.
- Mark appropriate proposals as "proprietary" never "confidential". Mark only those pages that must be protected.
- Submit your proposal electronically prior to the last 24 hours



# Some Important Facts to Remember

- Eligibility is determined at time of award
- No appendices allowed in Phase I
- The PI is not required to have a Ph.D.
- The PI is required to have expertise to oversee project scientifically and technically
- Applications may be submitted to different agencies for similar work
- Awards may not be accepted from different agencies for duplicative projects



# Questions

- Is NASA interested in my technology?  
Review last year's solicitation for potential areas of interest ([sbir.nasa.gov](http://sbir.nasa.gov)).
- What is NASA doing in this area of technology?
  - Call SBIR points of contact at the four NASA Centers that lead the subtopic that is closest to your interests and have them put you in touch with a technical person working in the subject area.
  - Calls must be made before solicitation opens.
- Does my proposal need to fit into a specific subtopic?
  - Yes, proposals that are not responsive to the solicitation may be classified "nonresponsive" and rejected.



# Questions

- What should my proposal look like ?  
A sample proposal is available at [sbir.nasa.gov](http://sbir.nasa.gov) –  
Procurement info – Contract Admin & Closeout - NASA  
SBIR/STTR Firms Library.
- Should I consider using consultants and subcontractors?  
Yes, but remember limitations (1/3 of research work for  
SBIR), and no NASA Personnel.
- Can I submit the same proposal to different subtopics if it  
applies?  
No, you risk having all proposals disqualified.



## Nature of NASA SBIR Contracts

- SBIR contracts are fixed price contracts to be completed on a best effort basis.
- Contractors own resulting intellectual property (data, copyrights, patents, etc.).
- Government has royalty-free rights for government use of intellectual property.
- Government protects data from public dissemination for four years after contract ends.



# Submission Process

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- All proposals are submitted electronically via the Internet
- Make sure your proposal is received on time - late proposals are rejected
- Proposals are screened for administrative completeness and turned over to the managing NASA Center for technical review



# Selection Process

## ➔ NASA Phase I Evaluation Criteria:

1. Scientific/Technical Merit and Feasibility (50%)
2. Experience, Qualifications and Facilities (25%)
3. Effectiveness of the Proposed Work Plan (25%)
4. Commercial Potential and Feasibility (adjectival)



# Selection Process

## ➔ NASA Phase II Evaluation Criteria:

1. Scientific/Technical Merit and Feasibility (50%)
2. Experience, Qualifications and Facilities (25%)
3. Effectiveness of the Proposed Work Plan (25%)
4. Commercial Potential and Feasibility (critical)
  - Commercial Potential of the Technology
  - Commercial Intent of the Offeror
  - Capability of the Offeror to Realize Commercialization



# Selection Process

- ➔ General Consideration in Proposal Ranking:
1. Will it meet NASA's technical need.
  2. Is it the best solution in the trade space.
  3. Can it be produced and qualified in the needed project timeframe.
  4. Probability that Company Can Successfully Commercialize Technology (Phase III).



# Selection Process

- ➔ All proposals are submitted electronically via the internet.
- ➔ Proposals are screened for administrative completeness and then sent to the managing NASA Center for technical review.
- ➔ All proposals are reviewed by NASA personnel at Centers.
- ➔ Source Selection Official makes final selections.

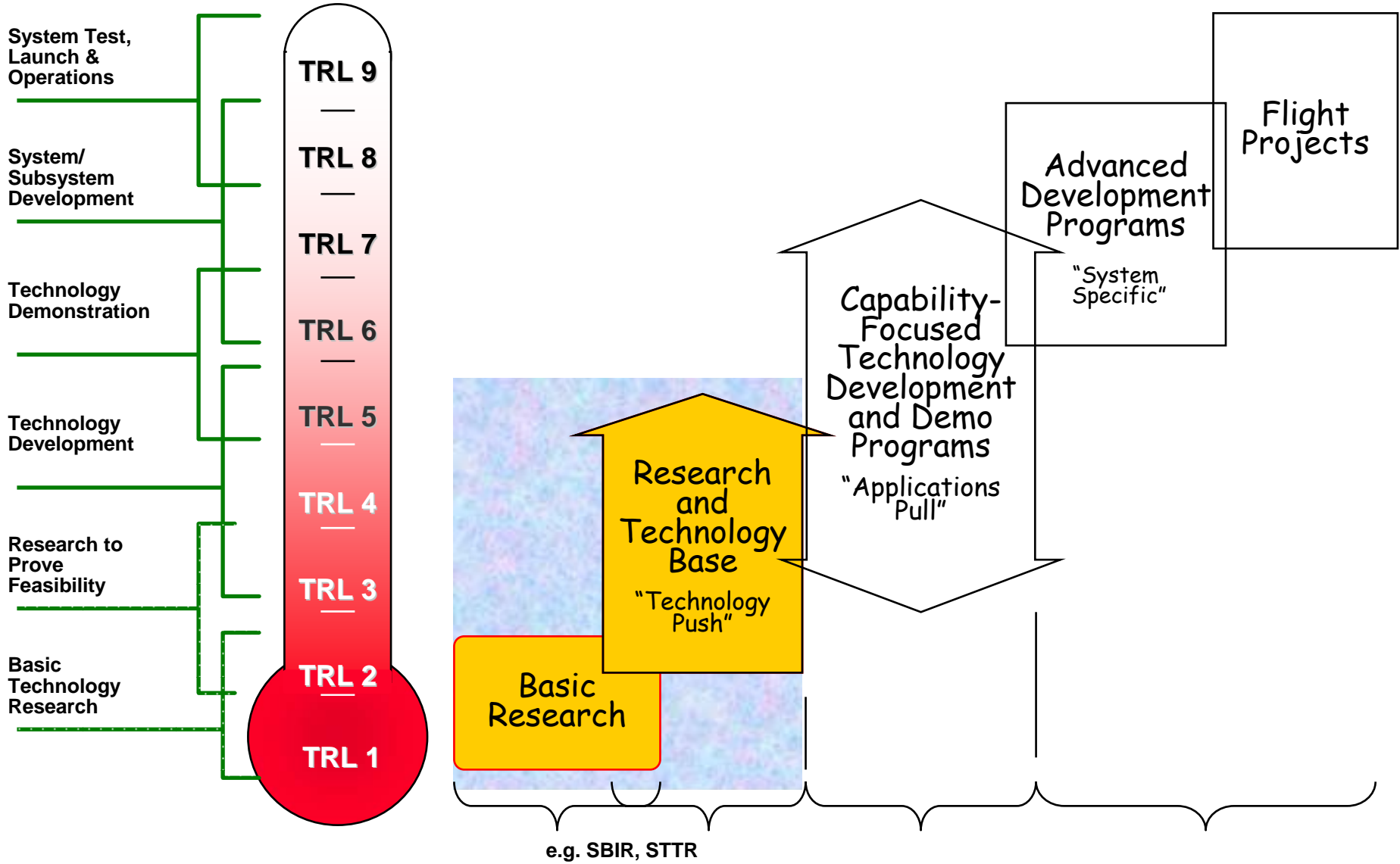


# Program Changes in 2007

- **The Program is now tracking the maturity of technologies funded by SBIR/STTR through use of Technology Readiness Levels (TRLs).**
  - TRLs range from one (1) to nine (9), with one (1) being a conceptual idea, six (6) being a prototype demonstrated in the relevant environment, and nine (9) being a fully operational mature technology.
  - For infusion purposes, this is very important information to know because projects generally avoid technologies that are not at least TRL six (6) by their preliminary design review.
  - Tracking TRLs will also provide insight into the progress that technologies are making, and over time, the performance of different firms for successful maturing technologies.



# SBIR and STTR Technology Readiness Levels





# Technology Readiness Level (TRL) Descriptions

Technology Readiness Level - (TRL)	Definition	Hardware Description	Software Description	Exit Criteria
1	Basic principles observed and reported	Scientific knowledge generated underpinning hardware technology concepts/applications.	Scientific knowledge generated underpinning basic properties of software architecture and mathematical formulation.	Peer reviewed publication of research underlying the proposed concept/application
2	Technology concept or application formulated	Invention begins, practical application is identified but is speculative, no experimental proof or detailed analysis is available to support the conjecture.	Invention begins, practical application is identified but is speculative, no experimental proof or detailed analysis is available to support the conjecture. Underlying Algorithms are clarified and documented.	Documented description of the application/concept that addresses feasibility and benefit
3	Analytical and/or experimental critical function or characteristic proof-of-concept	Analytical studies place the technology in an appropriate context and laboratory demonstrations, modeling and simulation validate analytical prediction.	Development of limited functionality to validate critical properties and predictions using non-integrated software components	Documented analytical/experimental results validating predictions of key parameters
4	Component or breadboard validation in laboratory	A low fidelity system/component breadboard is built and operated to demonstrate basic functionality and critical test environments and associated performance predictions are defined relative to the final operating environment.	Key, functionally critical, software components are integrated, and functionally validated, to establish interoperability and begin architecture development. Relevant Environments defined and performance in this environment predicted.	Documented test performance demonstrating agreement with analytical predictions. Documented definition of relevant environment.
5	Component or breadboard validation in a relevant environment	A mid-level fidelity system/component breadboard is built and operated to demonstrate overall performance in a simulated operational environment with realistic support elements that demonstrates overall performance in critical areas. Performance predictions are made for subsequent development phases.	End to End Software elements implemented and interfaced with existing systems conforming to target environment, including the target o software environment. End to End Software System, Tested in Relevant Environment, Meets Predicted Performance. Operational Environment Performance Predicted.	Documented test performance demonstrating agreement with analytical predictions. Documented definition of scaling requirements
6	System/subsystem model or prototype demonstration in a relevant environment	A high-fidelity system/component prototype that adequately addresses all critical scaling issues is built and operated in a relevant environment to demonstrate operations under critical environmental conditions.	Prototype software partially integrated with existing hardware/software systems and demonstrated on full-scale realistic problems.	Documented test performance demonstrating agreement with analytical predictions
7	System prototype demonstration in space	A high fidelity engineering unit that adequately addresses all critical scaling issues is built and operated in a relevant environment to demonstrate performance in the actual operational environment and platform (ground, airborne or space).	Prototype software is fully integrated with operational hardware/software systems demonstrating operational feasibility.	Documented test performance demonstrating agreement with analytical predictions
8	Actual system completed and flight qualified through test and demonstration	The final product in its final configuration is successfully demonstrated through test and analysis for its intended operational environment and platform (ground, airborne or space).	The final product in its final configuration is successfully [demonstrated] through test and analysis for its intended operational environment and platform (ground, airborne or space).	Documented test performance verifying analytical predictions
9	Actual system flight proven through successful mission operations	The final product is successfully operated in an actual mission.	The final product is successfully operated in an actual mission.	Documented mission operational results



# Program Changes in 2007

- **Science Mission Directorate added New Low-Cost Small Spacecraft and Technologies topic to portfolio**
  - Topic has subtopics which include;
    - nanosat launch vehicles and technologies,
    - secondary and tertiary launch technologies,
    - low-cost, rapid spacecraft design and multi-subsystem functionality, and
    - mission assurance tools.
- **Initiated option for NASA "Phase II Enhancement" (Phase II-E) funding**
  - The objective of the Phase II-E option is to provide incentive for Phase 3 awards by providing a cost share extension of the Phase II contract.
  - Under this option, NASA will match with SBIR/STTR funds up to \$150,000 of non-SBIR/non-STTR investment (Phase III contract) from a NASA project, NASA contractor, or third party commercial investor.
  - Phase II-E will assist a NASA program/project or third party investor to accelerate and/or enhance the infusion of the Phase II research into a NASA application or into a commercial product.



# Partnership Connections – Innovative Partnerships Program (IPP) Publications



<http://www.techbriefs.com/>

Electronics & Computers  
Semiconductors & ICs  
Mechanics  
Information Sciences  
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Manufacturing & Prototyping  
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Bio-MedicalTest & Measurement

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[http://www.sti.nasa.gov/spinoff/  
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index.html](http://ipp.nasa.gov/innovation/index.html)

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## For Further Information

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1. For administrative information specific to the SBIR Program refer to SBIR website:  
[SBIR.NASA.GOV](http://SBIR.NASA.GOV)
2. For information relative to other opportunities with NASA refer to the IPP home page:  
[IPP.NASA.GOV](http://IPP.NASA.GOV)



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