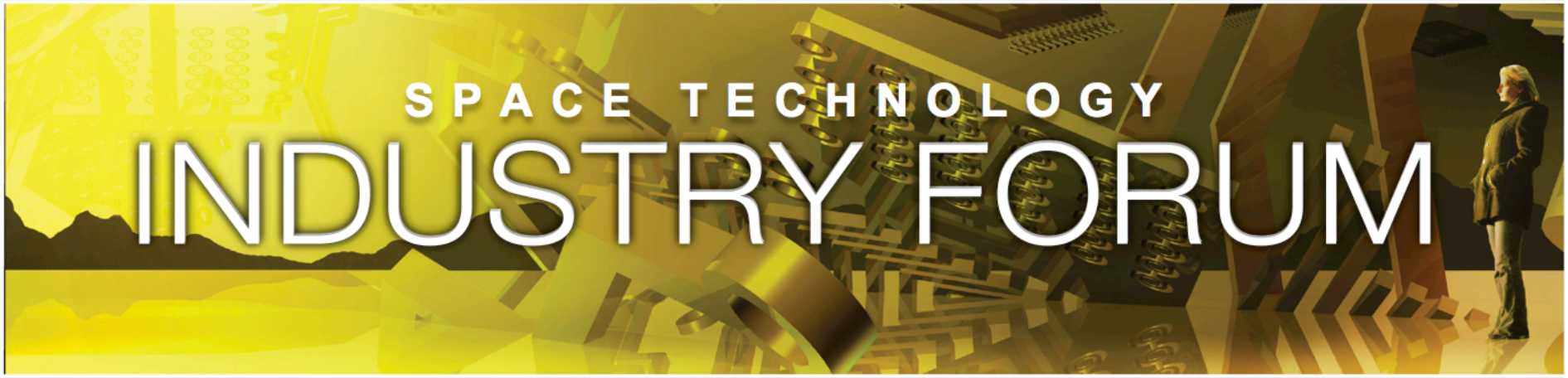
National Aeronautics and Space Administration

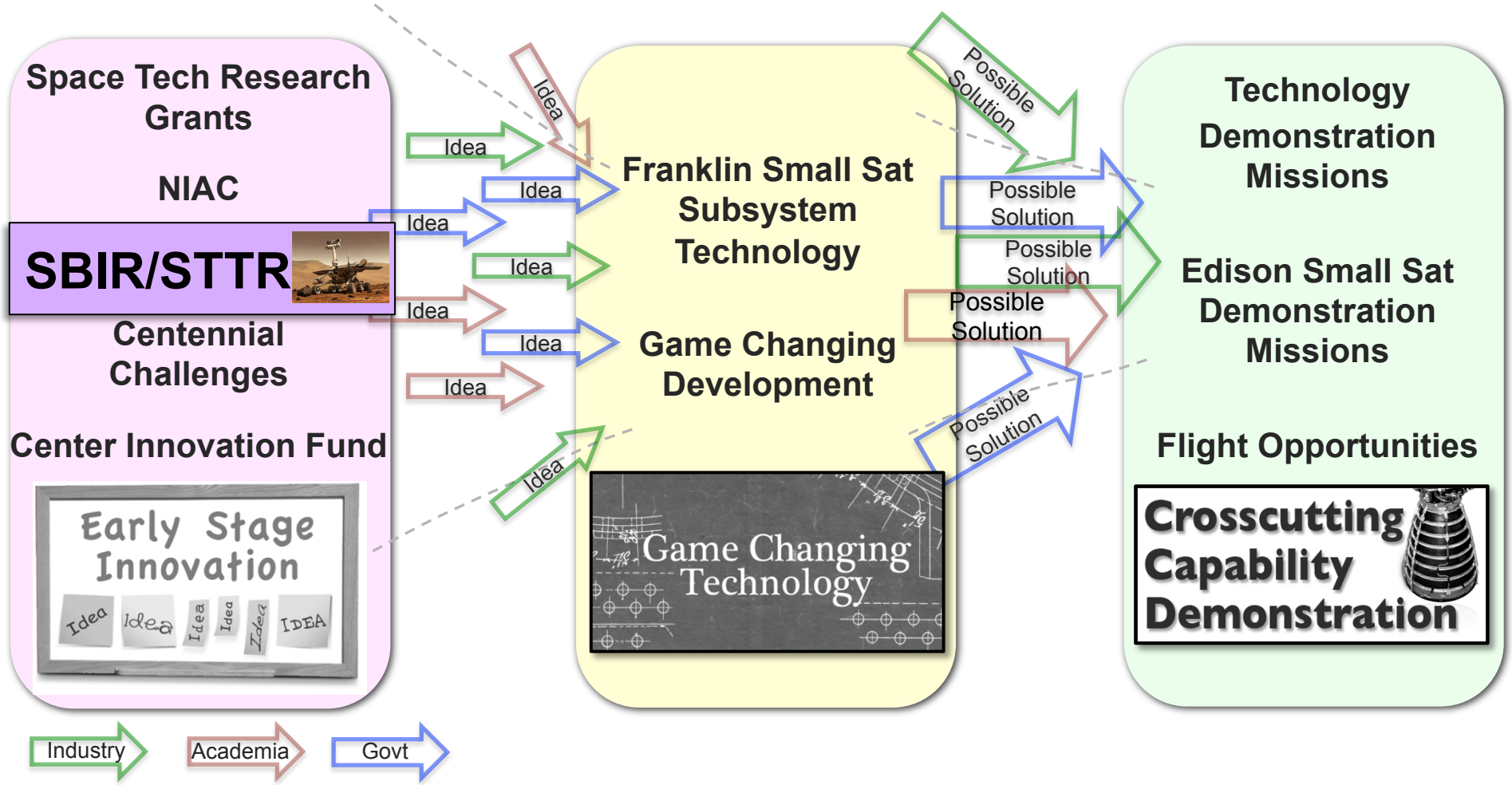
OFFICE OF THE CHIEF TECHNOLOGIST



The Small Business Innovation Research (SBIR) & the Small Business Technology Transfer Programs (STTR)

Carl G Ray
Program Executive
July 13, 2010

OCT Program Overview



1	2	3	4	5	6	7

Technology Readiness Level (TRL)

Small Business Innovation Research (SBIR) & Small Business Tech Transfer Research (STTR) Program

- The **Small Business Innovation Research (SBIR)** program awards contracts to small and disadvantage business concerns **providing opportunities to participate in Federal Research activities** and encourage entrepreneurship that results in **technology to meet NASA's needs as well as new commercial products and services.**

- The **Small Technology Transfer Research (STTR)** program requires cooperative research and development between small businesses and research institutions such as a university. The objective is **to take technologies out of research institutions and develop them to not only meet NASA's needs but also new commercial products and services**.

To engage small businesses in our Nation's space enterprise and infuse their technologies across NASA mission programs

SBIR/STTR Participating Agencies

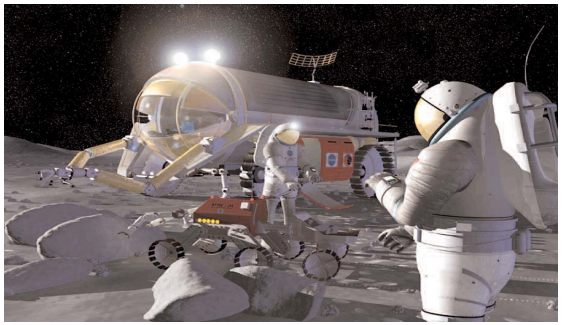
- DOD SBIR/STTR
- HHS SBIR/STTR
- NASA SBIR/STTR
- DOE SBIR/STTR
- NSF SBIR/STTR
- HLS SBIR/STTR
- USDA SBIR
- DOC SBIR
- EPA SBIR
- DOT SBIR
- ED SBIR

TOTAL ~ $2.6 B
FY 2010

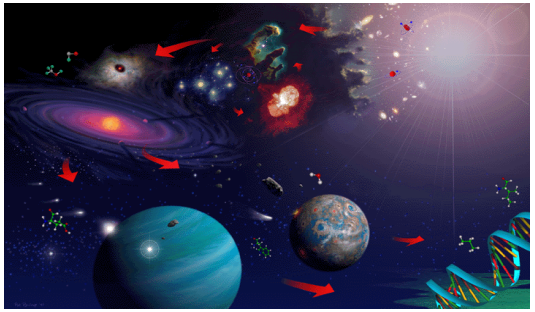
NASA SBIR/STTR Program Environment

- The SBIR/STTR programs are long-standing engines of innovation for this country. Now as an integral part of Space Technology Program, they will continue to build on their rich history and invest in both ideas and small companies across the Nation.
- The Center Chief Technologists will enhance the coordination between the SBIR/STTR programs and Mission Directorates on topic development, selection and reporting processes .

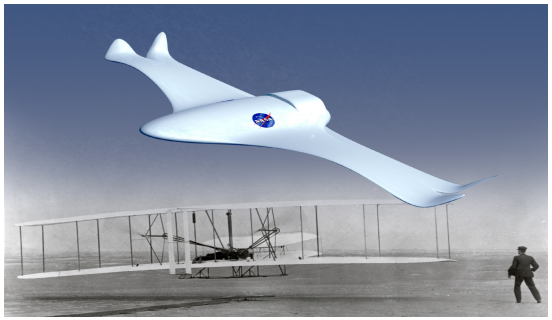
Exploration Systems



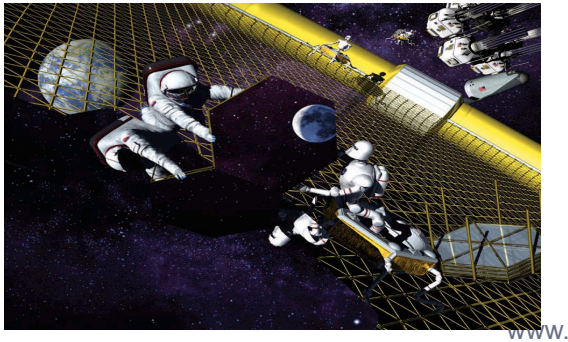
Science



Aeronautics



Space Operations



SBIR/STTR (Small Business Innovation Research / Small Business Technology Transfer) - Overview

- **Level II Program Office: ARC**

- **Level III Program Points of Contact : All NASA Centers**

- **Objective:** To engage and provide opportunity to small businesses to participate in Federal Research activities and encourage cooperative research and development with non-profit research institutions, respectively such as a university; with a primary objective of developing and facilitating the transfer of technology from research institutions through the entrepreneurship of small business contracts that result in technology to meet NASA's needs.

- **Awards:**

  - Consistent with pending reauthorization, current authorization provides for SBIR funding at a minimum of 2.5 percent of NASA's extramural research and development expenditures.
  - STTR is a separately funded activity. STTR is smaller than SBIR, with funding set at a minimum of 0.3 percent of the extramural research and development budget.

- **Collaboration:** The percentage of new firms participating in NASA's SBIR/STTR programs each year has been in the 30-50% range, yielding new applicants each year. New participants have submitted between 20-35% of the total number of proposals in any given year.

SBIR/STTR: 3-Phase Program

- **Phase 1**
  - Feasibility study
  - $100K Contract Award
  - 6 months duration (SBIR)
  - 12 months duration (STTR)

- **Phase 2**
  - Technology Development
  - 2-Year Contract Award
  - $750K (SBIR/STTR)
  - $150K Phase-2E/Phase 3 Bridge Option (New program Feature)

- **Phase 3**
  - Technology Infusion/Commercialization Stage
  - Use of non-SBIR Funding Agreements
  - Ability to award sole-source contracts without need for justification other than full and open competition; based on specific SBIR authority – NASA and NASA primes.

SBIR 2010 Solicitation Topics

Aeronautics Research

Topic	Topic Title
A1	Aviation Safety (15)
A2	Fundamental Aeronautics (10)
A3	Airspace Systems (2)
A4	Aeronautics Test Technologies (2)
A5	Integrated System Research Project (ISRP) (2)

Science

Topic	Topic Title
S1	Sensors, Detectors and Instruments (11)
S2	Advanced Telescope Systems (5)
S3	Spacecraft and Platform Subsystems (10)
S4	Low-Cost Small Spacecraft and Technologies (2)
S5	Robotic Exploration Technologies (6)
S6	Information Technologies (5)

Space Operations

Topic	Topic Title
O1	Space Communications (6)
O2	Space Transportation (5)
O3	Processing and Operations (3)
O4	Navigation (3)

Exploration Systems

Topic	Topic Title
X1	In Situ Resource Utilization (2)
X2	Advanced Propulsion (4)
X3	Life Support and Habitation Systems (4)
X4	Extra-Vehicular Activity Technology (3)
X5	Lightweight Spacecraft Materials and Structures (5)
X6	Autonomous Systems and Avionics (2)
X7	Human-Robotic Systems (1)
X8	High-Efficiency Space Power Systems (5)
X9	Entry, Descent, and Landing (EDL) Technology (2)
X10	Cryogenic Propellant Storage and Transfer (1)
X11	Exploration Crew Health Capabilities (1)
X12	Exploration Medical Capability (4)
X13	Behavioral Health and Performance (1)
X14	Space Human Factors and Food Systems (2)
X15	Space Radiation (2)
X16	In-flight Biological Sample Preservation and Analysis (1)

***Number of Subtopics under each Topic ( )**
***127 Subtopics Total**

Proposal Review & Selection Criteria

- Proposal Review
  - Factor 1: scientific/technical merit and feasibility (50%)
  - Factor 2: experience, qualifications and facilities (25%)
  - Factor 3: effectiveness of the proposed work plan (25%)
  - Factor 4: commercial merit and feasibility (adjectival)

- Other Factors
  - NASA Project/Mission Alignment
  - NASA Priority and Infusion Potentials
  - Champion Advocacy (NASA, Other Government)
  - Commercial potential

SBIR/STTR: Projected Number Awards

Approximate Number of Projected Awards

SBIR	FY11	FY12	FY13	FY14	FY15
Millions of $	139.3	139.7	132.4	135.3	143.2
Phase 1 Awards	360	330	325	335	360
Phase 2 Awards	160	135	128	130	136
Phase 2E Awards	30	30	24	28	34

STTR	FY11	FY12	FY13	FY14	FY15
Millions of $	18.9	19.0	18.1	18.5	19.6
Phase 1 Awards	38	36	32	32	35
Phase 2 Awards	23	20	19	20	21
Phase 2E Awards	3	2	2	2	2

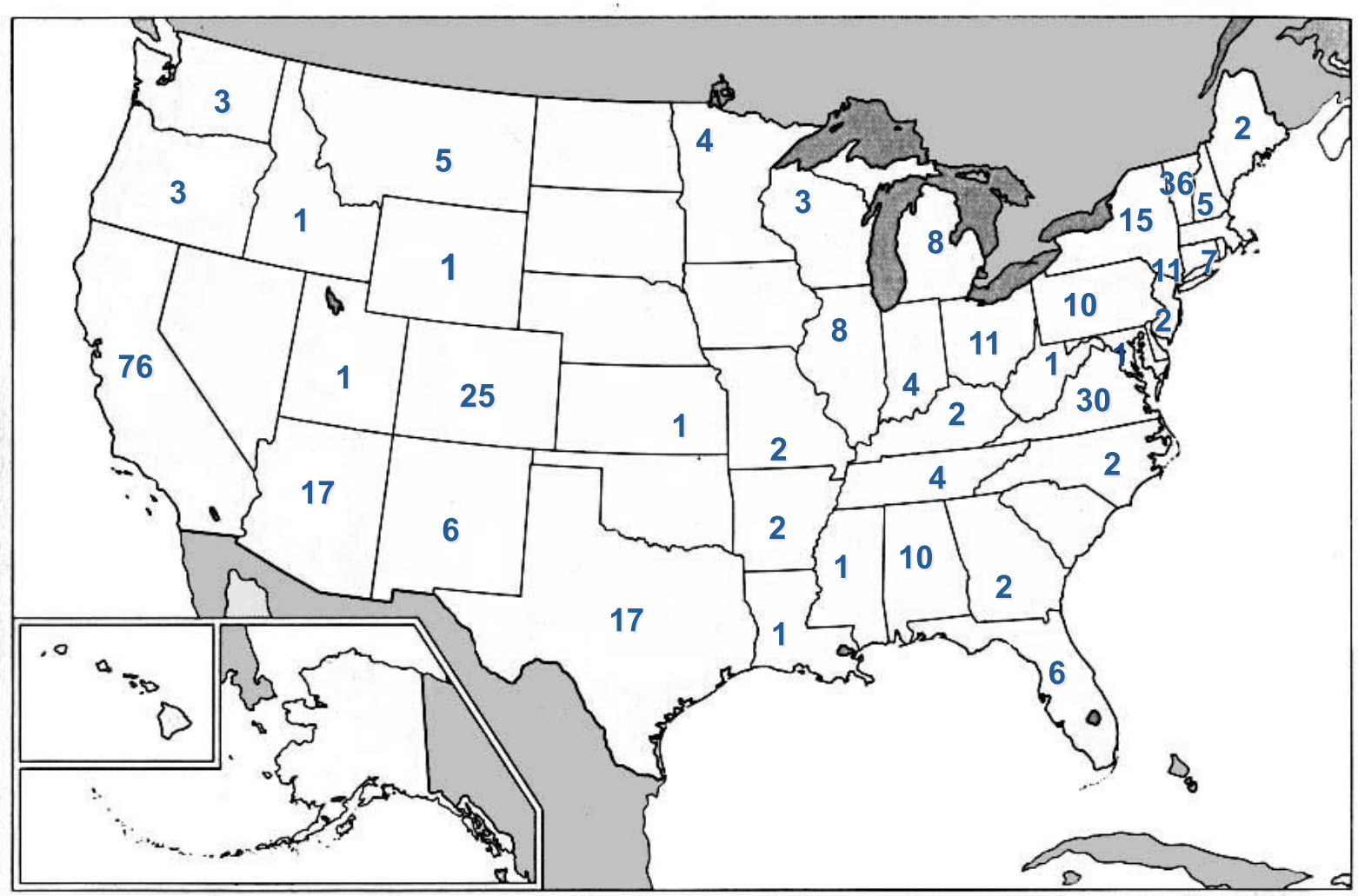
Assumes

Phase 1 =100K

Phase 2 = 750K (exception FY11= 600K)

Phase 2E =150K

SBIR 2009 Phase 1 Demographics

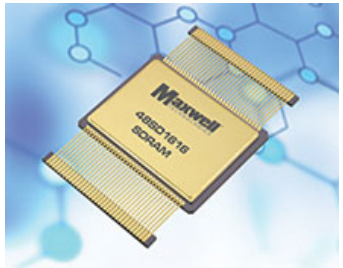


Number of Distinct States with Awards*: 39

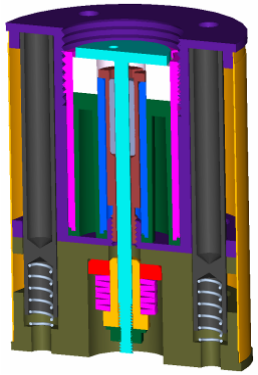
* Award count Includes 335 regular program awards plus 31 stimulus awards

Past SBIR Technologies - 2003 Mars Exploration Rovers

Yardney Technical Products of Pawtucket, Connecticut developed lithium ion batteries with specific energy of >100Wh/kg and energy density of 240 Wh/l and long cycle life. Subsequently, they won a large Air Force/NASA contract to develop batteries for space applications.



Maxwell Technologies of San Diego, California fabricated and tested an ASCII chip with single event latch up protection technology. Innovation enables the use of commercial chip technology in space missions, providing higher performance at a lower cost. Supplying A to D converter for Mars Rovers.

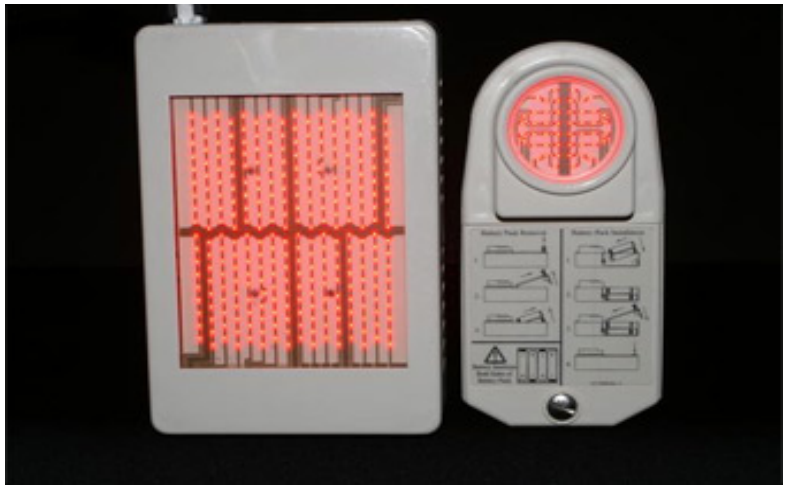


Starsys Research of Boulder, Colorado developed several paraffin based heat switches that function autonomously. Heat switches control radiator for electronics package on Mars Rovers.

Health and Healing – Photodynamic Therapy

WARP 75® Light-Emitting Diode (LED) Device

Quantum Devices, Inc.



INNOVATION (Phase 2 2003)

•The technology is a high-intensity LED unit intended for the treatment of chronic pain. This includes the temporary relief of minor muscle and joint pain, arthritis, muscle spasms and stiffness.

•The device is s 7.5 times larger, more powerful version (Fluence of 3.6 Watts) of the company's WARP 10® product

COMMERCIALIZATION

• WARP 75 is a registered trademark
• Product is commercially available
•Technology has become the industry standard for photobiomodulation (PBMT) research, photodynamic cancer therapy and agriculture research (Phase 3 2005)

GOVERNMENT/SCIENCE APPLICATIONS

SBIR/STTR Program Submission & Schedule

2010 Program Solicitation

– Opening Date: 07/19/2010

– Closing Date: 09/02/2010

– Announcement: 11/22/2010

http://sbir.nasa.gov

SBIR/STTR/Space Technology Program Benefits

The movement of SBIR/STTR to the Space Technology and the Early stage Division provides several new benefits and opportunities

1. Increased focus in technology provides more capability to strategically address the needs of the Mission Directorates
2. Multiple Early Stage opportunities will improve the quality of the application pool directed at the SBIR/STTR programs
3. The Space Technology structured program flow provides additional opportunities for SBIR/STTR proposers to strategically plan potential paths for maturing their technologies; Help getting through “valley of Death” and additional opportunities for maturation on Early Stage outcomes
4. SBIR/STTR program resources will be more available with better coordination of resources at each center

SBIR/STTR Program Benefits In Summary

- Provides NASA a platform to create and tap into a creative pool small business entrepreneurs for highly specialized areas of research
- Provides Opportunity for Small Businesses to participate in Federal R&D and expand their developed technologies into viable commercial products
- Creates an environment in which large businesses can access non-traditional sources with innovative solutions for resources and technologies
- Provides a pathway and mechanism for the academic and research communities to funnel, mature and apply their results to potential marketplace production streams
- Stimulates the national economy through continued growth of the research and development base, and the expansion of market driven products developed by the small business community