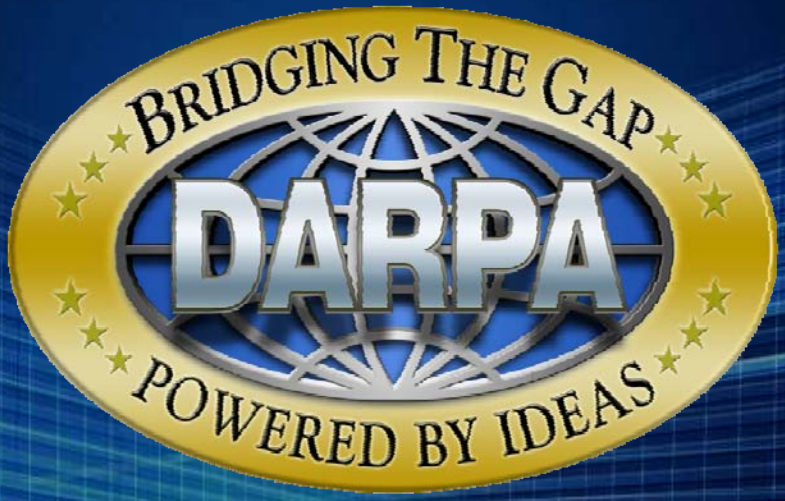


Defense Advanced Research Projects Agency (DARPA)
Strategic Technology Office

Dr. Larry Stotts
Dep Dir, STO
571-218-4346
larry.stotts@darpa.mil

Ms. Barbara McQuiston
Director, STO
703-526-4759
Barbara.McQuiston@darpa.mil

Dr. Brian Pierce
Dep Dir, STO
703-248-1505
brian.pierce@darpa.mil

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
MAR 2009		**00-00-2009 to 00-00-2009**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Defense Advanced Research Projects Agency (DARPA) Strategic Technology Office	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **Defense Advanced Research Projects Agency (DARPA),Strategic Technology Office,3701 North Fairfax Drive,Arlington,VA,22203**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES
MTO (DARPA Microsystems Technology Office) Symposium, 2009, Mar 2-5, San Jose, CA

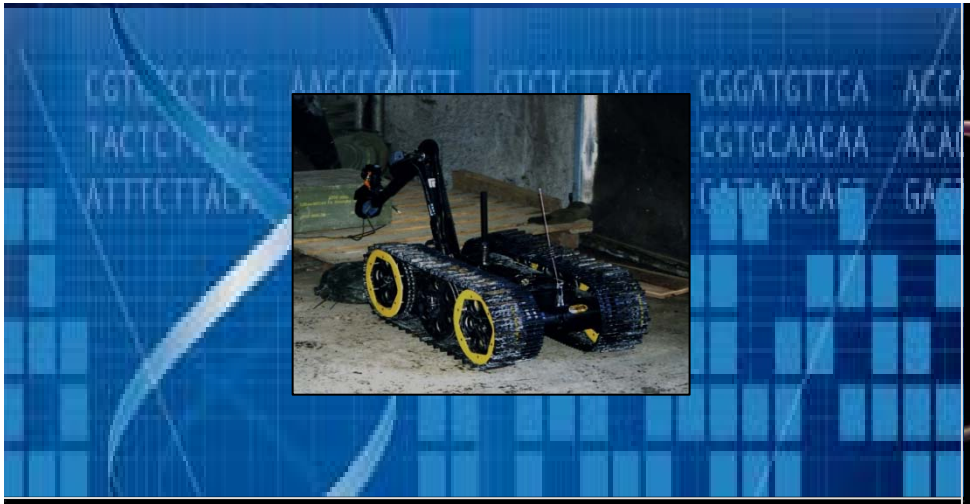
14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT **unclassified**	b. ABSTRACT **unclassified**	c. THIS PAGE **unclassified**	**Same as Report (SAR)**	**14**	

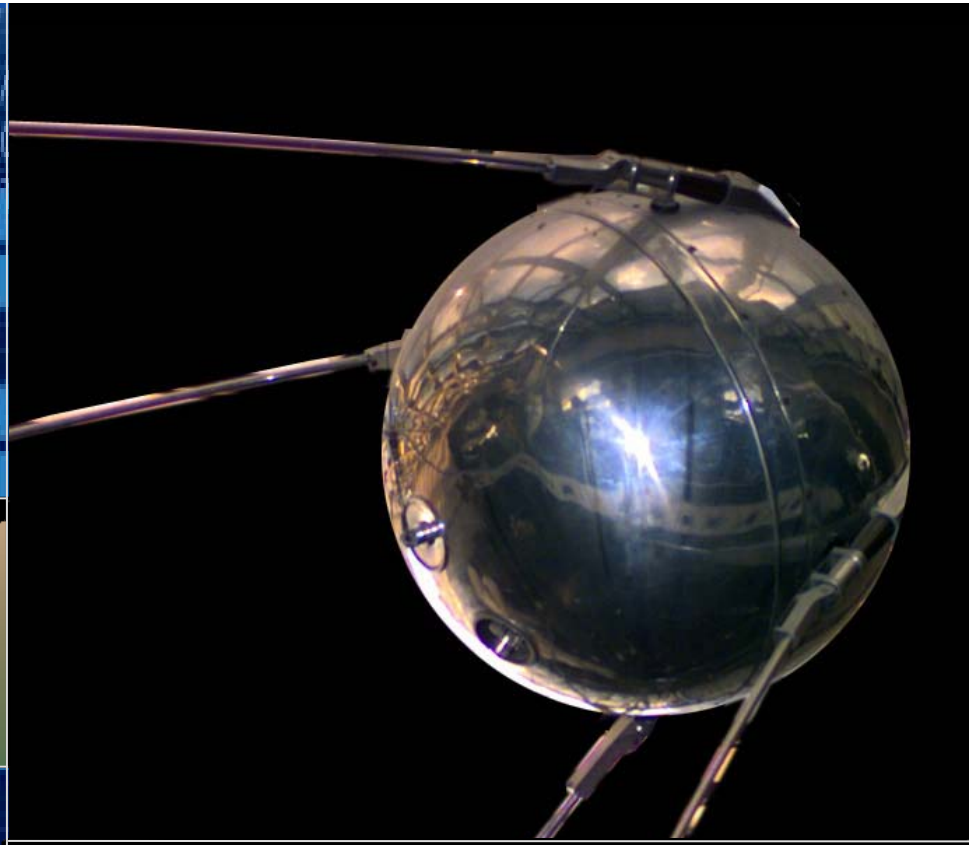
DARPA's Mission

DARPA's mission is to maintain the technological superiority of the U.S. military and prevent technological surprise from harming our national security by sponsoring revolutionary, high-payoff research that **bridges the gap between fundamental discoveries and their military use.**



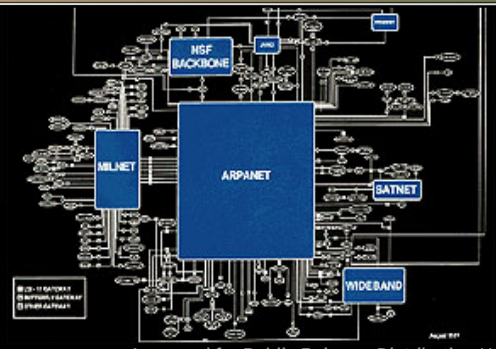
"The Science of Today is the Technology of Tomorrow"

- Edward Teller



"STO Technology of Today Enables the Future"

- STO Management



Strategic Areas of Investment

Strategic Technology Office

Strategic Areas of Investment

Characteristics of a DARPA Program

- ***Revolutionary change*** **in defense capability (not extensions or incremental gains)**
- **Empowered by ideas and passion of the *program manager***
- ***Project centric*** **– not investigator centric**
- **Creates opportunities, "encourages" *teams* – evaluated by Government**
- ***Flexible, rapid review*** **and contracting**
- ***Actively managed*** **by the program manager**
- **Driven by *quantitative milestones* leading to a Memorandum of Agreement (MOA) when possible**

Strategic Areas of Investment

CYBER /STRATEGIC AND TACTICAL NETWORKS

Network centric operations are the cornerstone of modern operations and they require reliable, available, survivable networks. Information is a key enabler in ensuring U.S. forces a dominant position in military operations.

PORTFOLIO

- National Cyber Range
- Dynamic Quarantine of Computer-Based Worm Attacks
- Connectionless Networking
- Optical RF Communications Adjunct
- Scalable Network Monitoring
- Wireless Network after Next
- Wolfpack

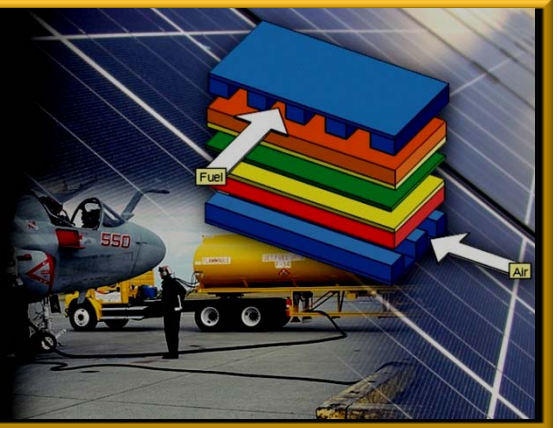
AREAS OF INTEREST

- **Reliable, robust, continuous connectivity**
- **Fast transport**
  - Surface and subsurface
- **Information superiority**
  - The network as a weapon
- **Defend the network**
  - Guarantee connectivity and survivability

Strategic Areas of Investment

ENERGY

New sources of energy and more efficient and effective uses of existing energy is a critical challenge for the United States and Department of Defense. It is an important component of all strategic and tactical operations.



PORTFOLIO

- **BioFuels (JP-8)**
- **Coal to Liquid**
- **Fuel Cells**
- **Fixed Grid Energy Systems**

AREAS OF INTEREST

Deployable Energy Network

Storage
- Harvesting/conversion
- Control

Smart Systems
- Energy Technology meets Information Technology

Distribution
- Wireless
- Superconducting

Energy Conversion
- Geothermal
- Waste

Strategic Areas of Investment

BIOLOGICAL AND HEALTH APPLICATIONS

Counter emerging biological, environmental and health threats. Develop health and medical technology, infrastructure and other health capacity building instruments to enable and enhance rapid, sustainable and minimal logistics-requiring operations in an austere or functionally-austere (one which for geopolitical or war-fighting or disaster response reasons is functionally austere) environments.

PORTFOLIO

- Radiation Biodosmetry
- Stand Off Triage
- Breath Diagnostics

AREAS OF INTEREST

Stand Off Triage

Stand Off Soldier Health Monitoring

Stand Off Soldier Care

Survival Pack

- 24 hour
- Extended

In-field Medic Test Diagnostics

Broad Spectrum Hazard Indicators

Strategic Areas of Investment

SUSTAINMENT IN AUSTERE ENVIRONMENTS

Meet expeditionary force need to effectively operate in deserts, mountains and high latitude regions that severely restricts key military capabilities. Develop capabilities not only benefit US forces but have significant benefits for disaster relief, initially supporting civilian functions.

AREAS OF INTEREST

- **Infrastructure in a Box**
- **Feels Like Sea Level**
  - maintain physiology as though you were at sea-level maintain effective oxygen volume
- **Operational Supremacy in Extreme Environments**
- **Dense Nutrition Supplements**
- **Water Harvesting (Potable/Scale)**
- **Anti-Icing**
- **Deep Sea**

Strategic Areas of Investment

WARFARE: CONVENTIONAL AND IRREGULAR

Forces face asymmetric forces operating in complex terrain who capitalize on the intrinsic benefits of mass, popular support and the defense. Conventional warfare is less likely but the most dangerous. In all areas, but especially in this warfare area need to look for manufacturing processes for new technologies or existing that are faster, cheaper, adaptive, portable and provide manufacturing flexibility and independence.

PORTFOLIO

- Advanced Sensing Technologies
- Vision Systems
- Next Generation Communications
- Underground Structures

AREAS OF INTEREST

- Portable Manufacturing
- AT/Temper Resistant Expendable Technology
- Develop a universal, symbol-based command and control system
- Revolutionary Force Projection

Strategic Areas of Investment

GLOBAL ISR AND NATIONAL DEFENSE

Defending United States territory and forces. Provide the ability to detect threats and support offensive strikes around the world. Develop capabilities to detect and counter Chemical, Biological, Radiological, and Nuclear (CBRN) threats. Exploit the inherent capabilities and vulnerabilities of deep sea operations.

PORTFOLIO

- **Low Altitude Airborne Sensor System**
- **ISIS**
- **Sub-Surface Navigation**
- **Seismic and Acoustic Imaging**

AREAS OF INTEREST

Standoff detection of weapons, explosives, chem/bio/nuclear

***Technical Challenges*:**

- Identification of observable characteristics
- Highly cluttered environment
- Historical correlations to create an acceptable false alarm rate
- Signal attenuation and dispersion (physics limitations)

Strategic Areas of Investment

SPACE & NEAR-SPACE SENSORS & STRUCTURES

Space is an operational domain, with space and near space remain the strategic high ground of all operations. Command and control, communications, ISR, targeting and other decisive functions depend on it.

PORTFOLIO

- ISIS
- Large Area Coverage Optical Search
- Multifunctional Electro-Optics
- Multipath Exploitation Radar
- Quantum Sensors
- Symbiotic Communications

AREAS OF INTEREST

- Continuous, reliable, stand-off tracking of air and ground moving targets, day or night
- Seek and engage tracked targets
- Battle Damage Assessment

What's Next?