



# **The Defense Advanced Research Projects Agency**

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# DARPA ?

- **Small Agency, directly part of the Office of the Secretary of Defense (OSD)**
  - **About** 240 people, 140 of which are technical staff
  - **Budget** approximately \$2B
- **Created** in 1958 in response to Soviet Sputnik
- **Work with**, but not part of Military Department Science and Technology structure
- **Execute** projects through Services, industry or academia but **with** direct participation by **DARPA Program Managers**
- **Takes pride** in innovation & **non-conventional approaches**

# DARPA Mission

- **Prevent technological surprise**
- **Pursue high-payoff technologies and military concepts**
- **Accept high risk where payoff warrants**
- **Address critical developments requiring extended focus**
- **Provide new military capabilities & solutions to military problems**

# Examples of Past DARPA Contributions

- Modern Network Systems (Internet, WWW)
- Stealth in several forms
- Saturn Space Launch Vehicle
- Vela Hotel Satellites
- M-16 rifle
- Unmanned air vehicles and underwater vehicles
- Interactive simulation systems
- Major C3 upgrade for forces in Bosnia
- Miniature GPS receivers (and "Soldier 911")
- Speech research and applications (e.g. Translators)
- Materials, electronic device and information technology foundations

# Principal Competencies

- **Computing, software and networks**
- **Electronic devices**
- **Materials**
- **Mathematics**
- **Signal Processing**
- **Sensors and Surveillance systems**
- **Information systems**
- **Defense platforms (aircraft, ships, land vehicles) and weapon systems**
- **Guidance and control**

# DARPA Approach

- **Stay on the leading edge**
- **Quickly exploit new inventions, ideas, concepts with potential military utility**
- **Gain the flexibility to do that by program turnover**
  - **No institutionalized facilities or programs**
  - **Staff to current priorities - personnel rotation**
  - **Ruthlessly kill lower payoff efforts**
- **But some important, technically tough problems must be pursued over longer term in series of related phases.**

# Technical Organization

## Defense Sciences

**Materials**  
**Def Healthcare**  
**Bio Defense**  
**Mathematics**  
**Manufacturing**

## Electronics Technology

**Low Power**  
**MEMS; Displays**  
**Optoelectronics**  
**Packaging**  
**Sensors/Devices**

## Information Technology

**Networking**  
**SW Engineering**  
**Distributed Syst.**  
**Scaleable Systems**  
**Info Survivability**

## Sensor Technology

**Advanced Sensors**  
**Detect/Locate/Track Targets**  
**Counter Air-Breathing Threat**

## Tactical Technology

**Platforms**  
**Weapons and Guidance Technologies**  
**Small Unit Operations**

## Information Systems

**Battlefield Awareness**  
**Planning/C3**  
**Advanced Simulation**

# **Top 10 Military Priorities for DARPA**

- **Comprehensive battlefield awareness**
- **Near-real-time C3, planning and replanning**
- **Simulation for “continuous war” environment**
- **Biological warfare defense**
- **Cruise missile defense**
- **Small-unit military operations**
- **Logistics “system”**
- **New approaches to ASW and Countermine**
- **Unmanned systems including affordable, attritable UAVs**
- **Radical new military concepts**