Department of Defense Basic Research

14TH ANNUAL

SCIENCE & ENGINEERING TECHNOLOGY CONFERENCE / National Defense Industrial Association

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Office of the Assistant Secretary of Defense for Research and Engineering

April 24, 2013

Why Basic Research at DoD?

(from the DSB Task Force Report on Basic Research)

- **Basic research probes the limits of today's technologies and discovers new phenomena and know-how that ultimately lead to future technologies.**
- **Basic research funding attracts some of the most creative minds to fields of critical DOD interest.**
- **Basic research funding creates a knowledgeable workforce by training students in fields of critical DOD interest.**
- **Basic research provides a broad perspective to prevent capability surprise by fostering a community of U.S. experts who are accessible to DoD, and who follow global progress in both relevant areas, as well as those that may not seem relevant — until they are.**

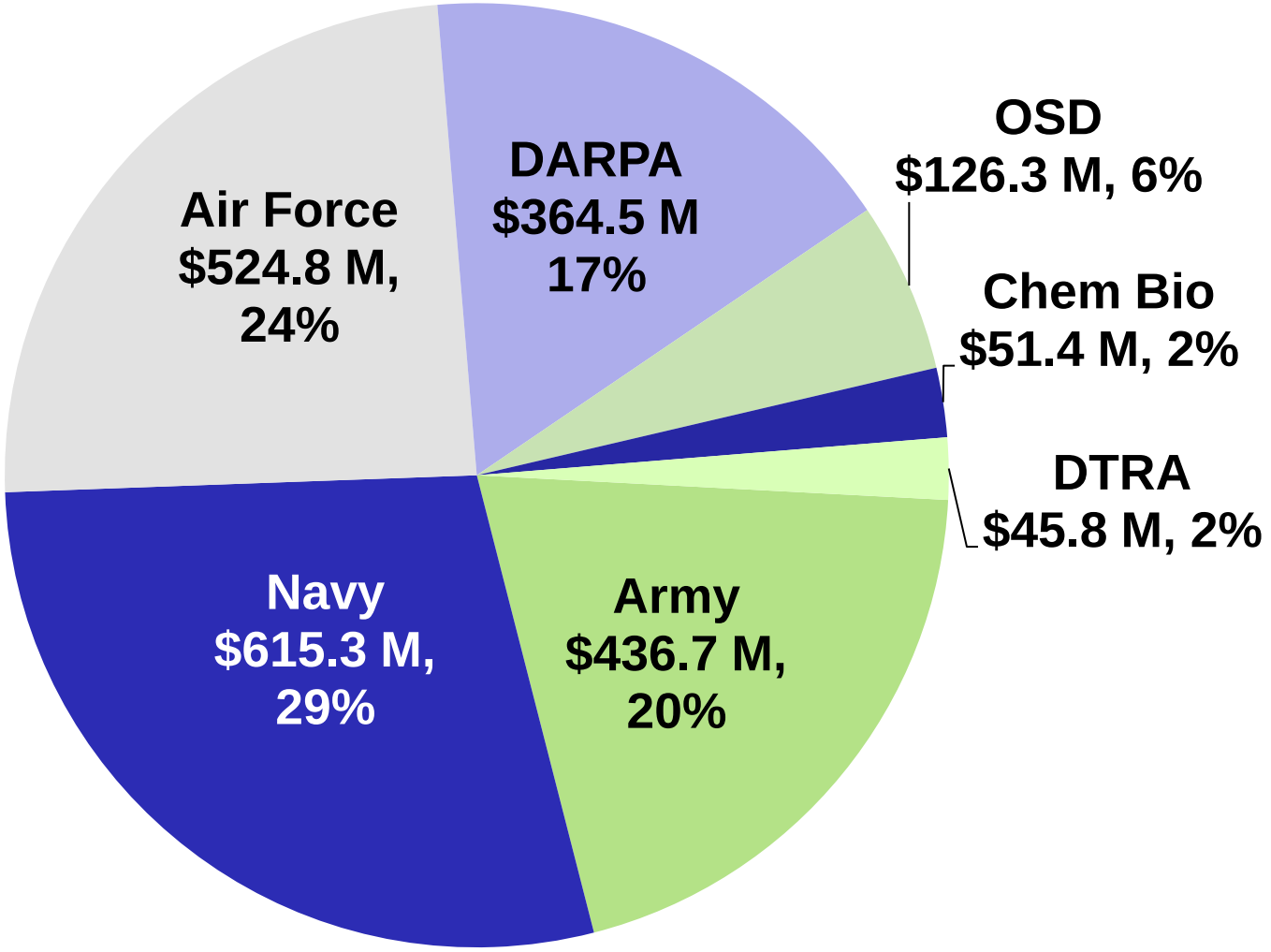
Five Examples of DoD Basic Research Leading to Game Changers

- Global Positioning Satellite (GPS) System
- Gallium Arsenide (GaAs) Microwave Electronics
- Magnetic Random Access Memory (MRAM)
- Stealth Technology
- Kalman Filter

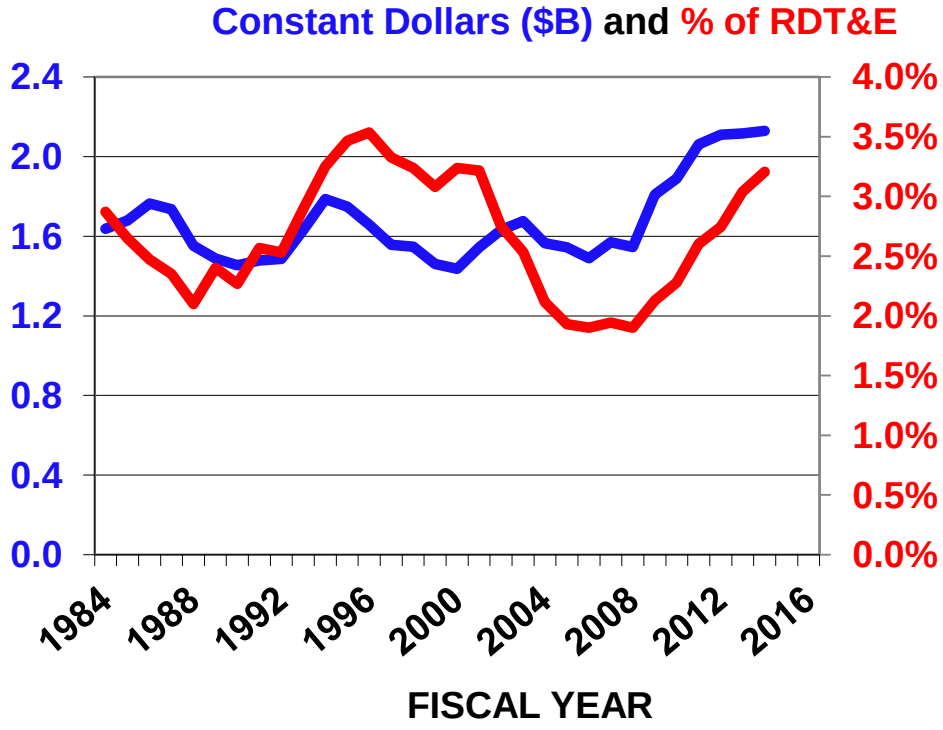
Reference: DSB Task Force, p10

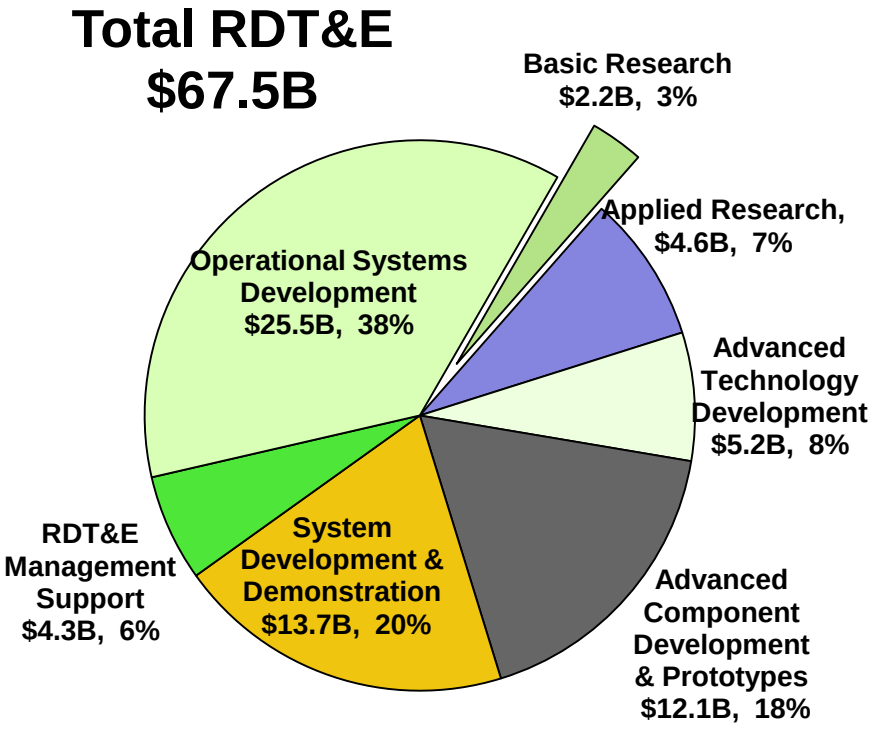
DoD Basic Research by Component
FY14 President's Budget Request

TOTAL
$2,165 M

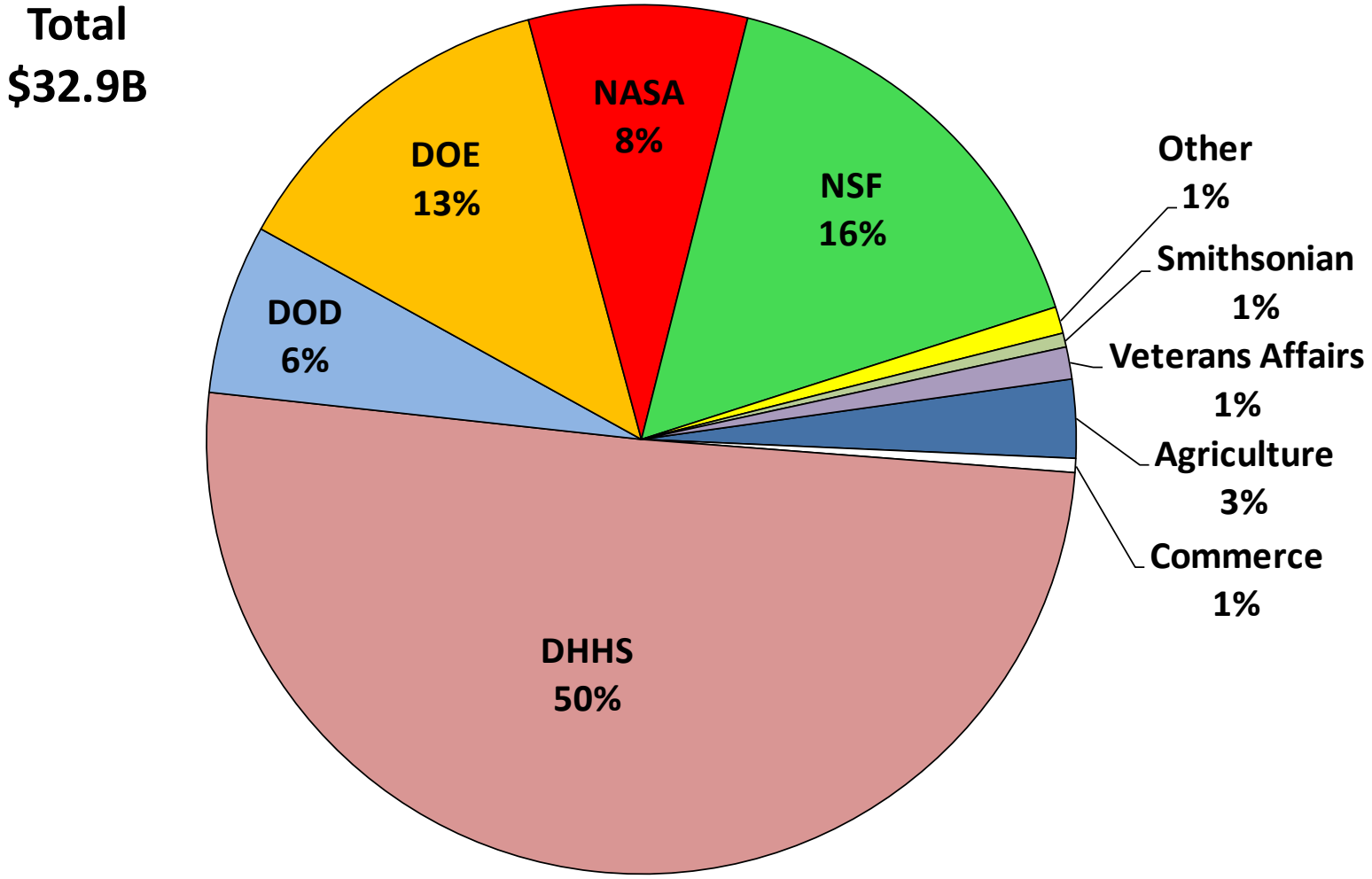


DoD Basic Research 2014 PBR

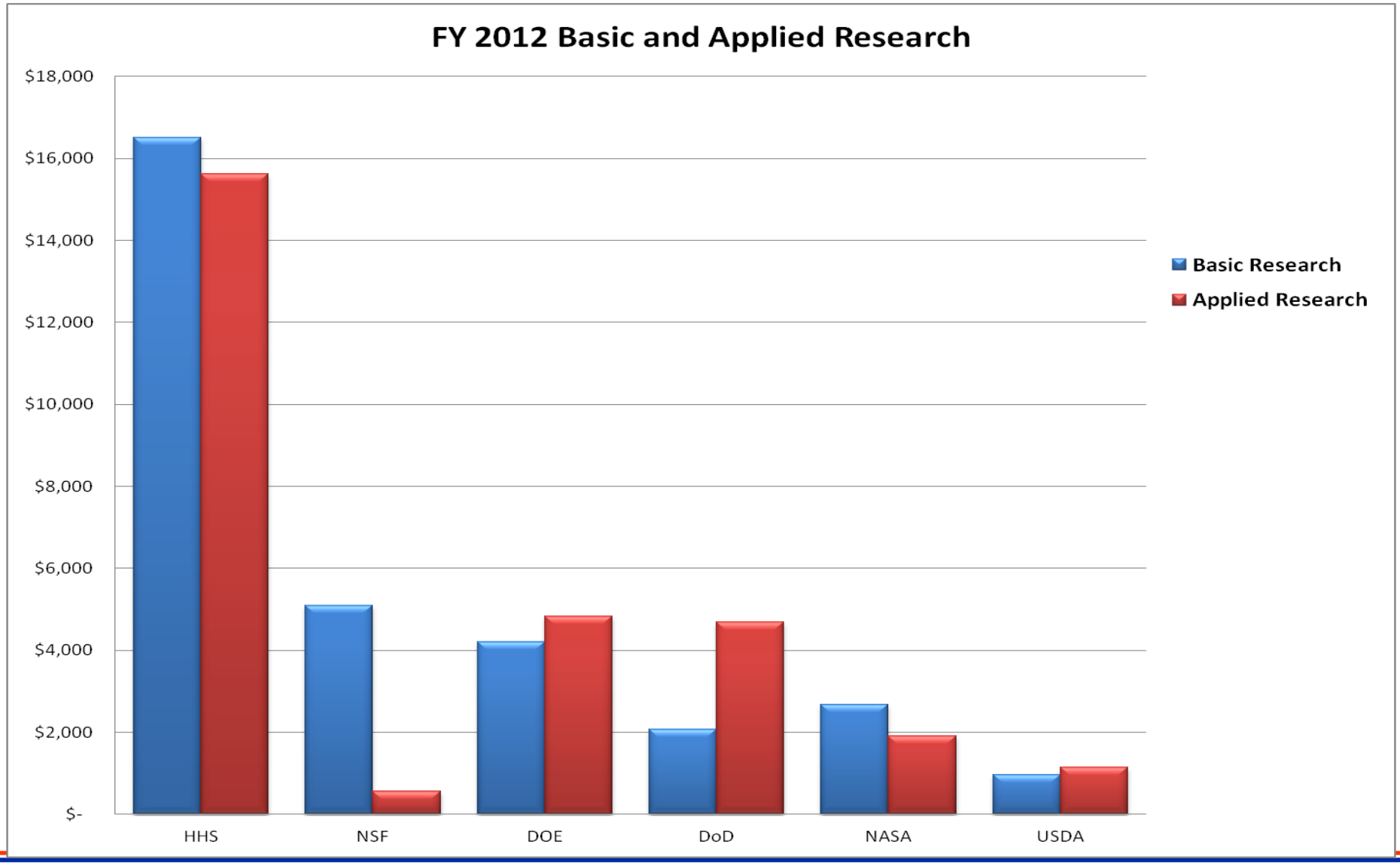




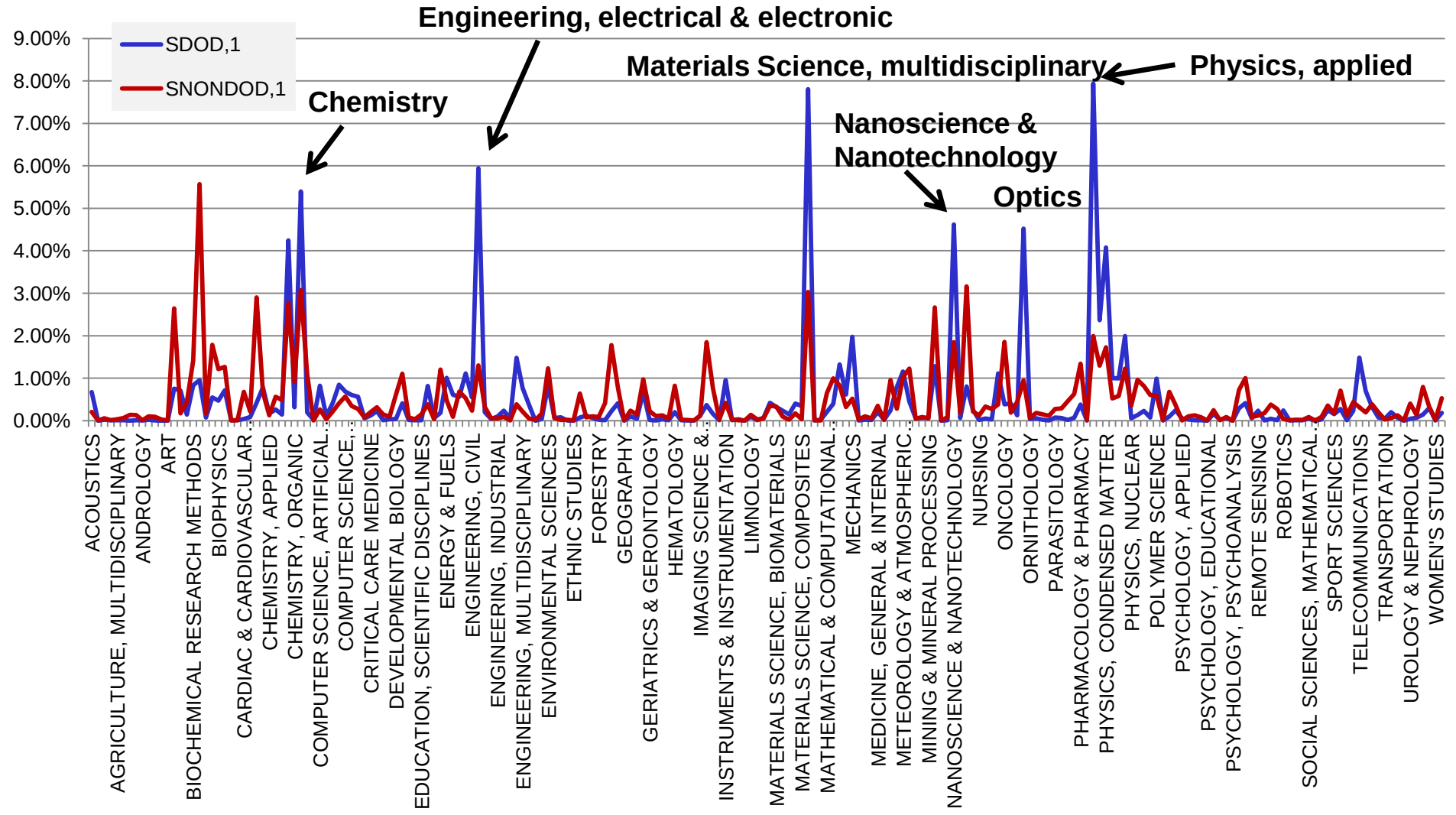
DoD Basic Research is 6% of Overall Federal Agency Support



Basic and Applied Research by Agency

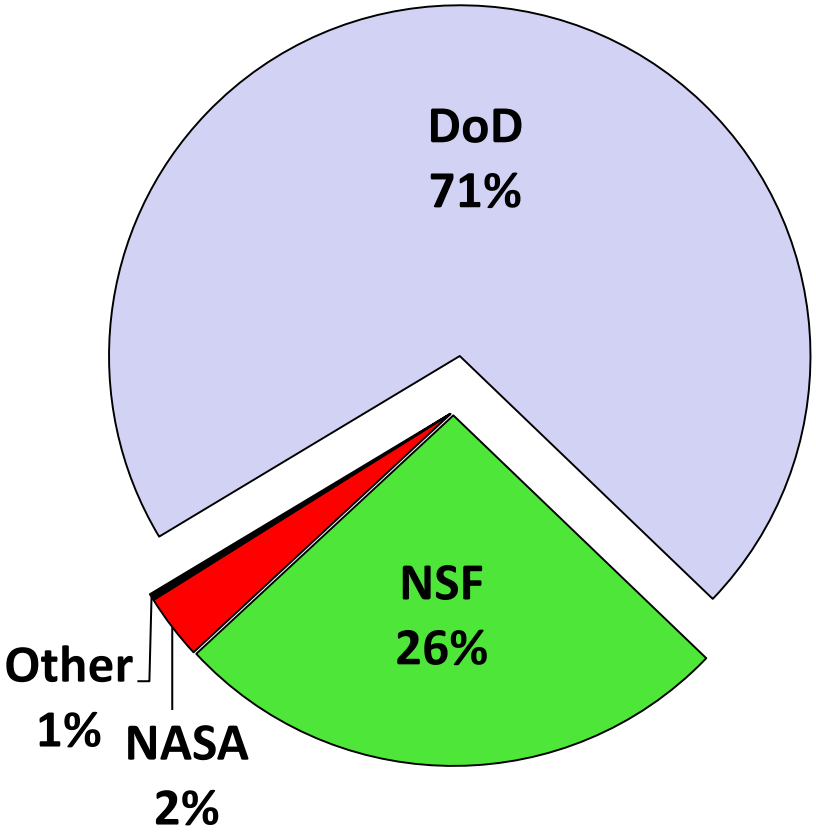


Selective Basic Research Portfolio

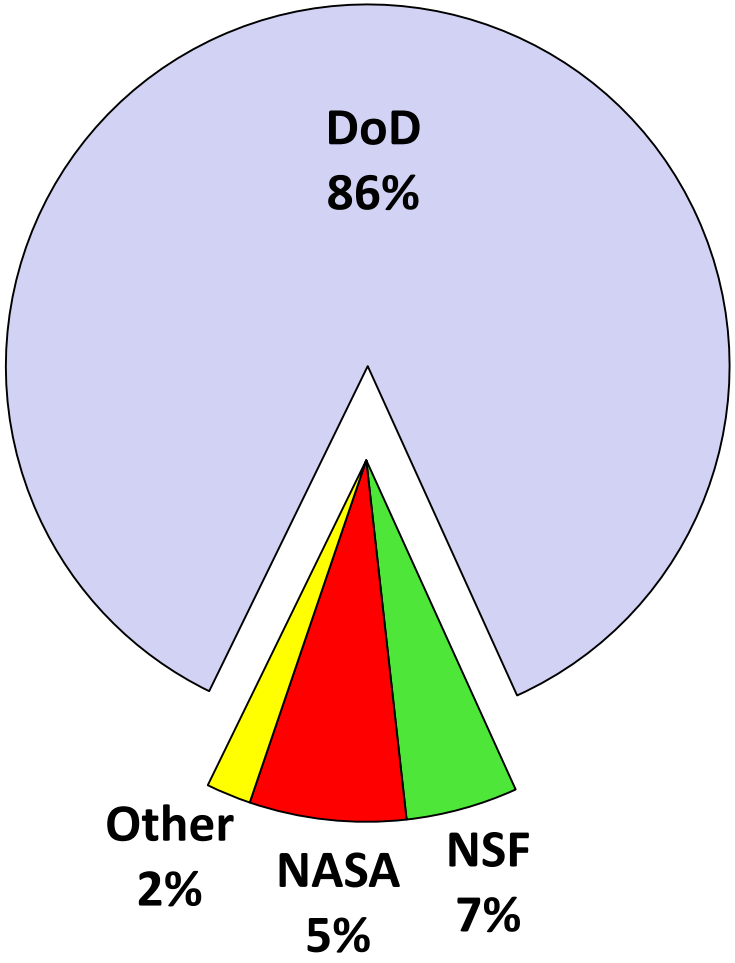


DoD Dominates Share of Federal Basic Research in Certain Fields

ELECTRICAL ENGINEERING



MECHANICAL ENGINEERING



SOURCE: FY 08 obligations from "Federal Funds for Research and Development" survey data on NSF WebCASPAR system

The First MURIs: 1986

NEWS RELEASE

OFFICE OF ASSISTANT SECRETARY OF DEFENSE
(PUBLIC AFFAIRS)
WASHINGTON, D.C. · 20301
PLEASE NOTE DATE

No. 315-86
(202) 695-0192 (Info.)
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FOR RELEASE AT
4:00 p.m. EDT

June 26, 1986

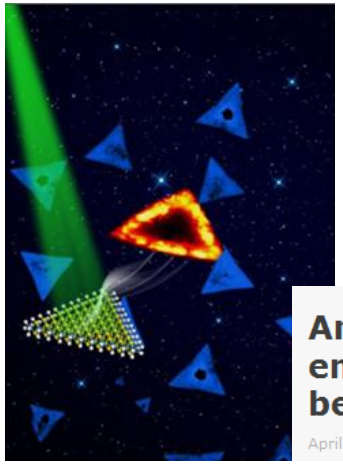
DOD SELECTS ACADEMIC INSTITUTIONS FOR
UNIVERSITY RESEARCH INITIATIVE

Secretary of Defense Caspar W. Weinberger announced today the 70 academic institutions selected in the Department of Defense's (DoD) technical competition for the new University Research Initiative (URI). Subject to the successful completion of negotiations between DoD and these institutions and subject to the availability of FY87 funds for URI, approximately $110 million in FY86/87 funds are expected to be awarded to the 70 institutions for 86 research programs. Programs are expected to range between $170,000 and $3 million.

Basic Research/MURI Impacts

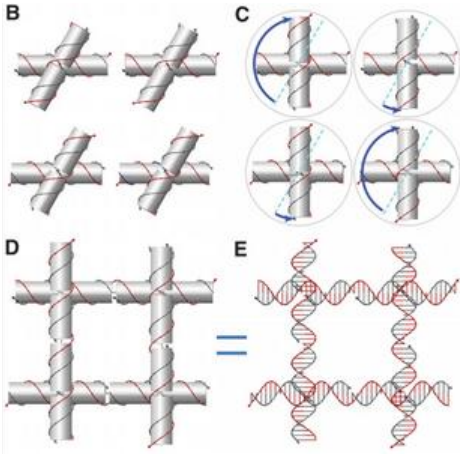
Preliminary results from a commissioned study on the impact of the MURI awards show that the 500+ MURIs have directly lead to:

- **24,500+ publications**
- **563,000+ citations**
- **570+ patents**
- **7,270+ derived patents**
- **Numerous start-up companies, students trained, and popular press articles**



ASU scientists develop innovative twists to DNA nanotechnology

03/25/2013



3 April 2013

Lowering tunneling resistance in GaN/InGaN/GaN structures

Army sees potential in light-emitting monolayers to benefit Soldiers

April 9, 2013

17 April 2013 Last updated at 20:41 ET

Recruiting engineered cells to work for warfighters

Wed, 04/10/2013 - 12:22pm

Footage reveals how insects use their bodies to hover

Industrial Outreach

Industrial Outreach: Instituted

- Invited Industry to attend **MURI Annual Review** through NDIA
  - Attended by 16 major DoD contractors

    Lockheed Martin Skunk Works, Lockheed Martin Advanced Technology, Lockheed Martin Physics, Northrup Grumman, BBN, Applied Research Associates, Robotic Technology Inc, MITRE, iRobot Aerospace, Draper laboratory, Honeywell, Alion, Crane, Intelligent Automation, DGNSS Solutions, Planned Systems International
- Held **MURI 25th Anniversary Session** at NDIA Meeting
  - Attended by 50 industry managers
- Posted list of active MURI's on ASD(R&E)/Basic Science website (http://www.acq.osd.mil/rd/basic_research/muri_partners/list.html)
- Invited industry scientists to emerging areas workshops

Industrial Outreach: Proposed

- Encourage PI presentations at industry-oriented meetings and conferences
- Invite relevant industry reps to MURI and program reviews
- Proposals solicited for new "at the crest-of-the-wave" MURI topics
  - Service-proposed OSD approved topics

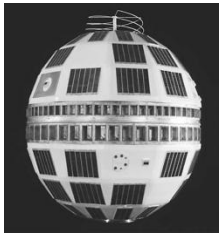
Multidisciplinary University Research Initiatives (MURI): Investing for the Future

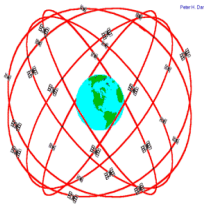
- Currently ***157 Active MURI Projects*** spanning multiple technical fields (details at website below)
- Industry ***welcome*** at annual MURI Reviews
  - Chance to meet with PIs and other performers
  - Initiate collaborations
  - Keep track of latest basic research innovations
- Next MURI Review – ***All NDIA Invited***
  - *(Tentative) Date:* ***July 22-24, 2013***
  - *Location :* ***Arlington, VA***
  - *Limited number of seats – check website for registration information (coming soon)*

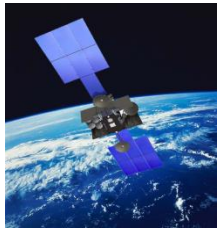
For more information contact: Director, Basic Research
Dr. Robin Staffin - robin.staffin@osd.mil
Website: http://www.acq.osd.mil/rd/basic_research/

DoD Basic Research: the Early Foundations of Progress









40s	50s	60s	70s	80s	90s	00s
• Nuclear weapons	• Digital computer	• Satellite comm.	• Airborne GMTI/SAR	• GPS	• Wideband networks	• GIG
• Radar	• ICBM	• Integrated circuits	• Stealth	• UAVs	• Web protocols	• Armed UAVs
• Proximity fuse	• Transistor	• Phased-array radar	• Strategic CMs	• Night vision	• Precision munitions	• Optical SATCOM
• Sonar	• Laser technology	• Defense networks	• IR search and track	• Personal computing	• Solid state radar	• Data mining
• Jet engine	• Nuclear propulsion	• Airborne surv.	• Space track network	• Counter-stealth	• Advanced robotics	• Advanced seekers
• LORAN	• Digital comm.	• MIRV	• C2 networks	• BMD hit-to-kill	• Speech recognition	• Decision support