

# The Honorable Heidi Shyu

## Under Secretary of Defense for Research and Engineering

### FY24 President's Budget Request - DoD Science, Technology, and Prototyping Priorities



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Washington, DC  
13 April 2023



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## FY24 President's Budget Successes

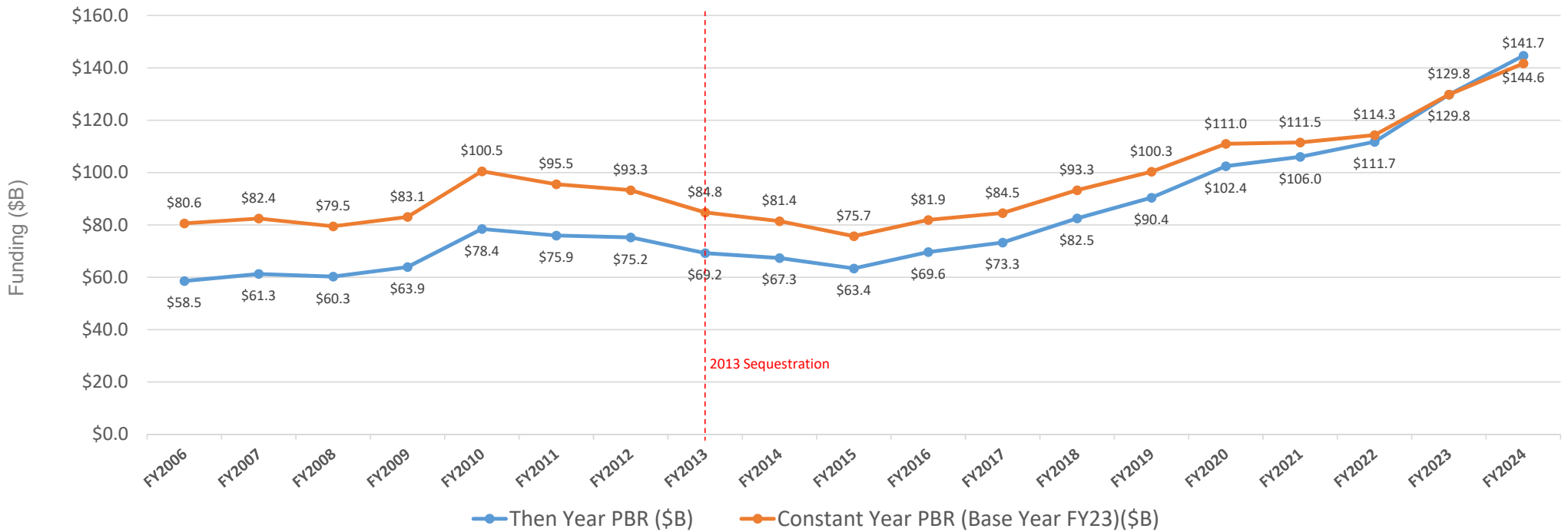
- The FY24 President's Budget Request for RDT&E of \$145B is the largest ever, up 12% over FY23 PB.
- The Request for S&T of \$17.8B is the largest ever, up 8.3% over FY23 PB.
- The Request for Basic Research of \$2.48B is up 4% over FY23 PB.
- The Request for Basic Research in R&E is up by 43%
- The Request included significant funding increases for Microelectronics, Quantum, Future G, HBCU/MIs, TRMC, and Renewable Energy



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# FY06-24 PBR DoD-Wide RDT&E (6.1-6.8) Funding Overview

**FY2023 PB to FY2024 PB**  
**Total RDT&E Budget DoD-Wide Up by 12%**



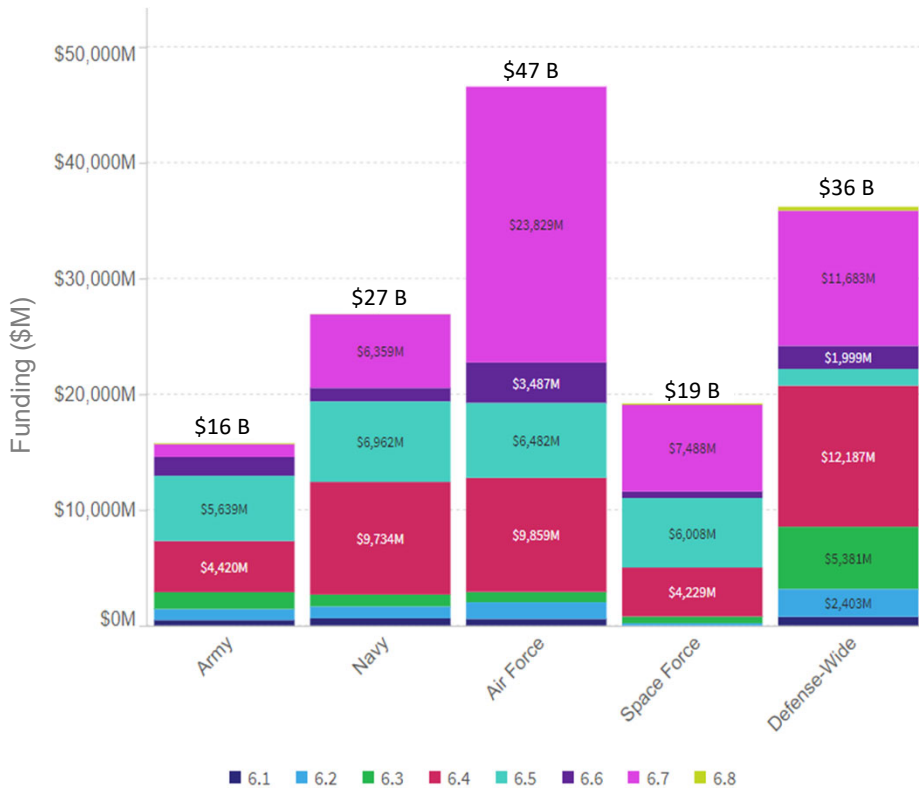
"DoD-Wide" includes "Defense-Wide" (aka, Fourth Estate) and Services.  
 "Defense-Wide"/"Fourth Estate" refers to OUSD(R&E) HQ, DIU, DARPA, SCO, MDA, and other Office of the Secretary of Defense agencies and field activities.  
 "Then Year" refers to Current Dollars. "Base Year" refers to Constant Dollars, with FY23 as Base Year.



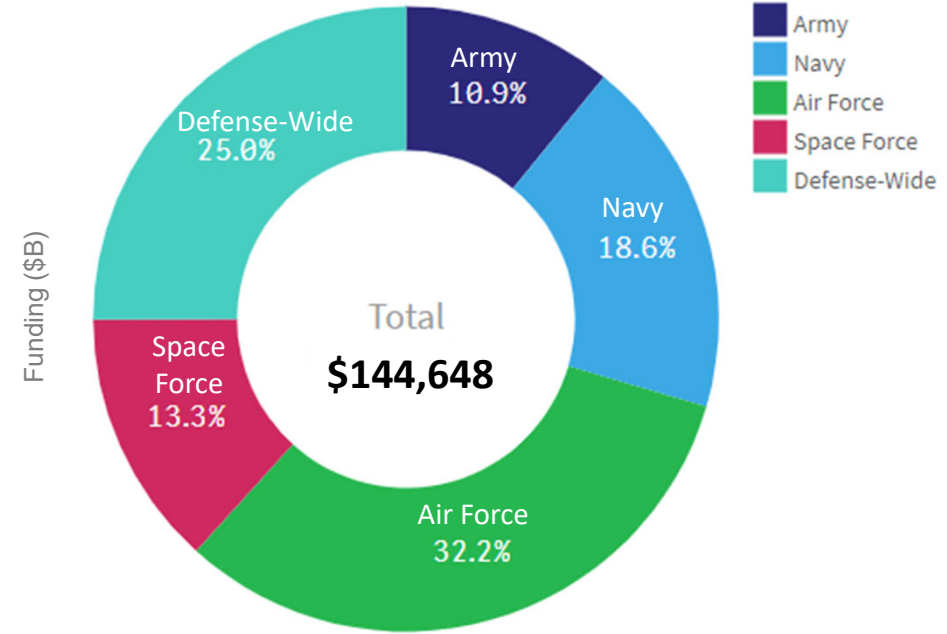
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# FY24 PBR DoD-Wide RDT&E (6.1-6.8) Funding Overview

Total FY24 PB RDT&E by Budget Activity (BA)



Total FY24 PB RDT&E by Service



**Total FY24 PB RDT&E (\$145 B) – 12% higher than FY23 PB (\$130 B)**

"DoD-Wide" includes "Defense-Wide/Fourth Estate" and Services.

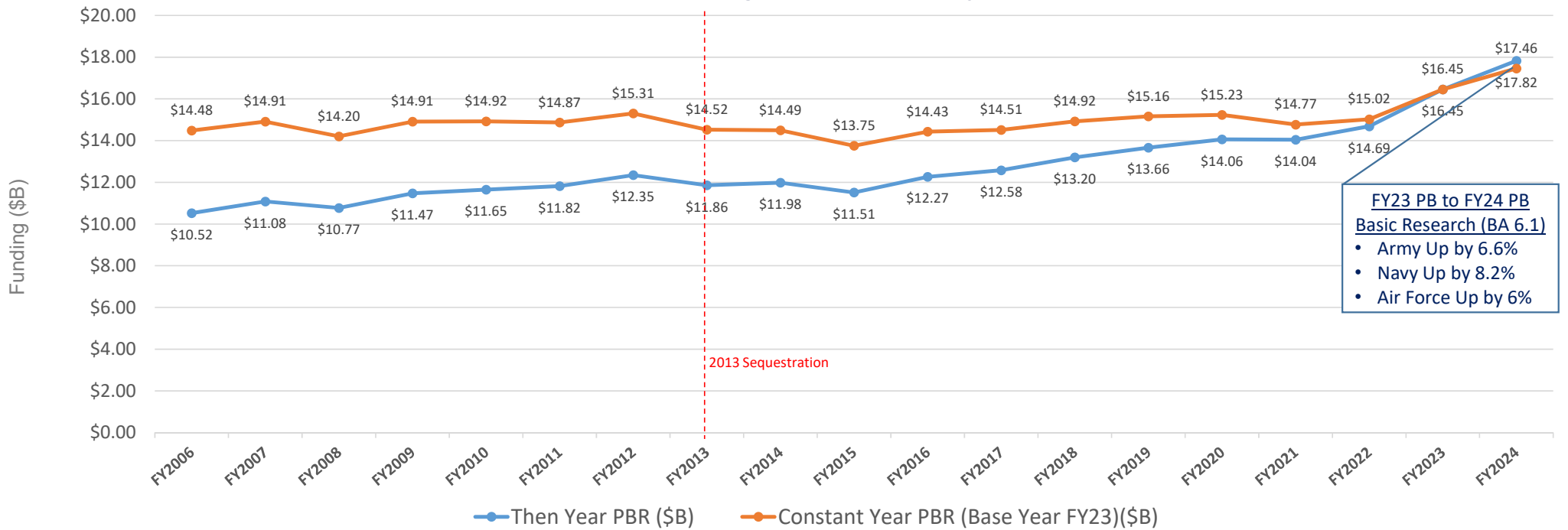
"Defense-Wide /Fourth Estate" refers to OUSD(R&E) HQ, DIU, DARPA, SCO, MDA, and other Office of the Secretary of Defense agencies and field activities



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# FY06-24 PBR DoD-Wide S&T (6.1-6.3) Funding Overview

**FY2023 PB to FY2024 PB  
Total S&T Budget DoD-Wide Up by 8.3%**



**FY23 PB to FY24 PB  
Basic Research (BA 6.1)**

- Army Up by 6.6%
- Navy Up by 8.2%
- Air Force Up by 6%

"DoD-Wide" includes "Defense-Wide" (aka, Fourth Estate) and Services.

"Defense-Wide"/"Fourth Estate" refers to OUSD(R&E) HQ, DIU, DARPA, SCO, MDA, and other Office of the Secretary of Defense agencies and field activities.

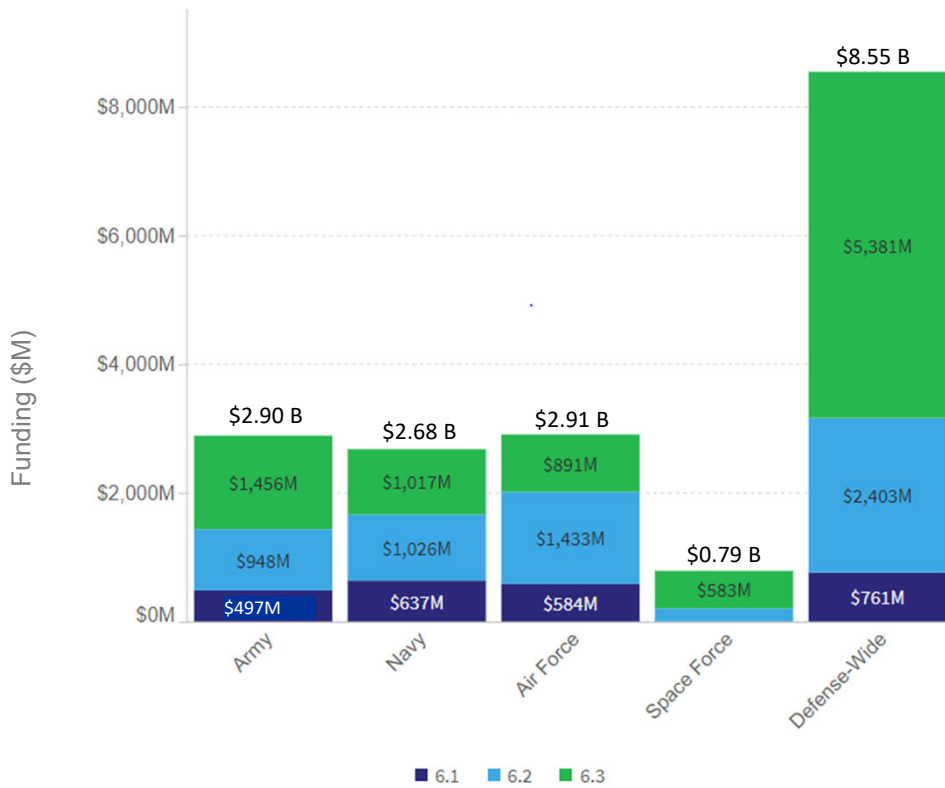
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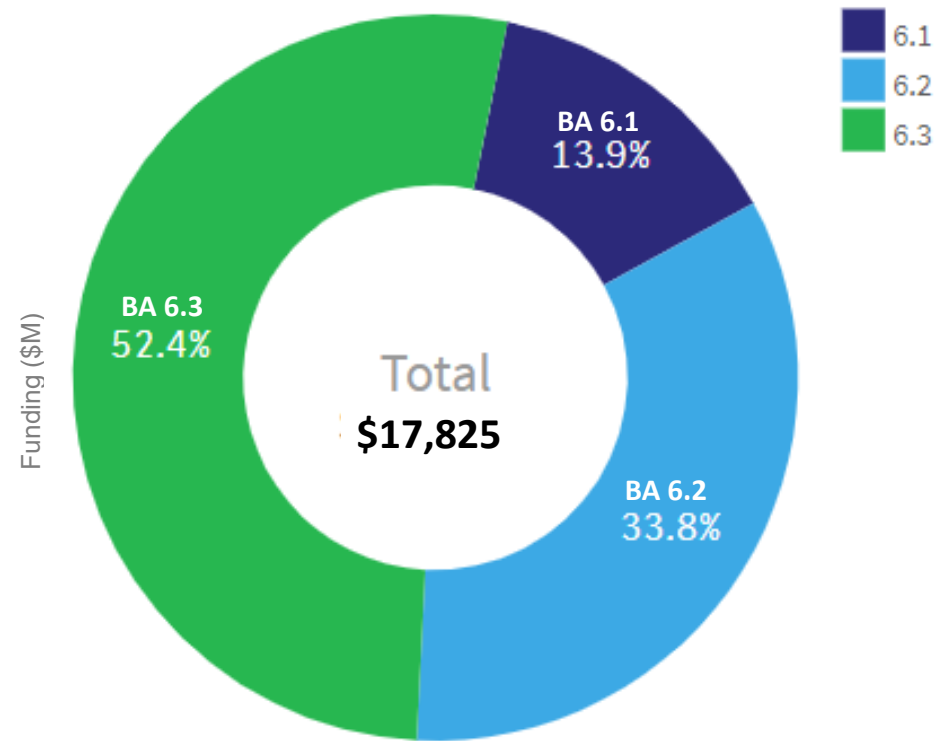
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# FY24 PBR DoD-Wide S&T Funding (6.1-6.3) Overview

Total FY24 PB RDT&E DoD-Wide for S&T (BA 6.1-6.3)



Total FY24 PB S&T Funding by Budget Activity



**Total FY24 PB S&T Funding (\$18 B) – 8.3% higher than FY23 PB (\$16.5 B)**

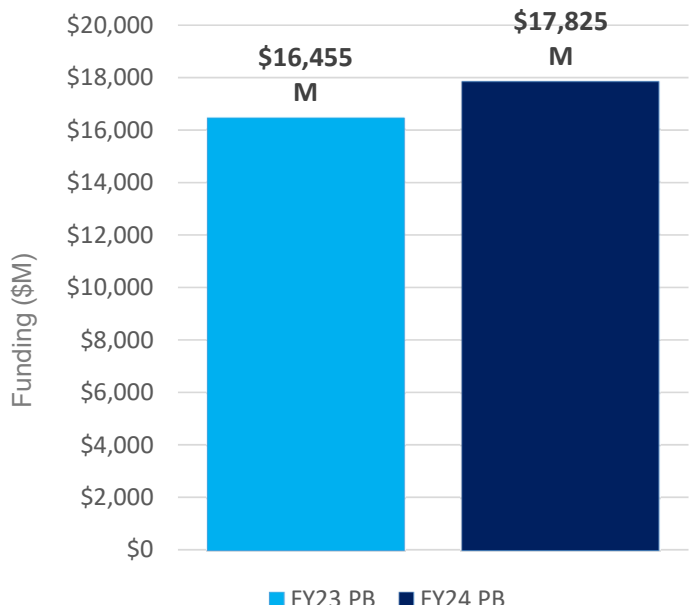
“Defense-Wide” refers to Total Fourth Estate.  
 “DoD-Wide” includes Fourth Estate and Services.  
 “Fourth Estate” refers to OUSD(R&E) HQ, DIU, DARPA, SCO, MDA, and other Office of the Secretary of Defense agencies and field activities.



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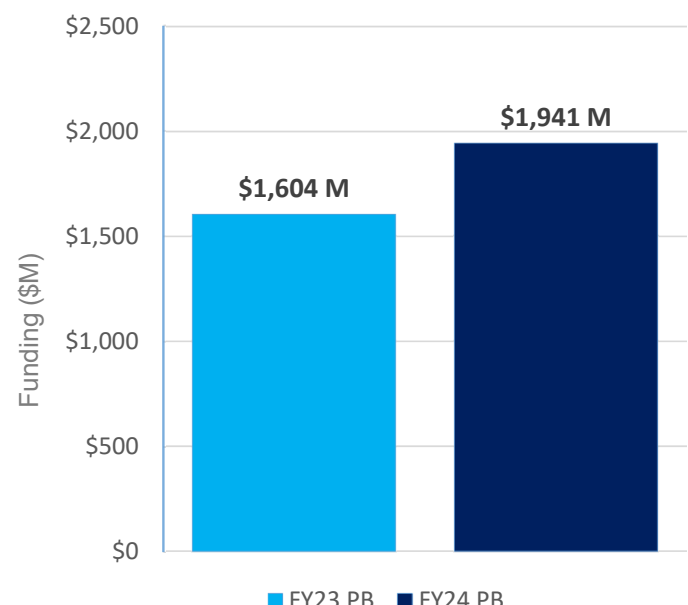
# FY24 Total S&T Budget (6.1-6.3) – Up 8% DoD-wide, 20% for OUSD(R&E)

### FY23 PB to FY24 PB Total S&T Budget DoD-Wide Up by 8.3%



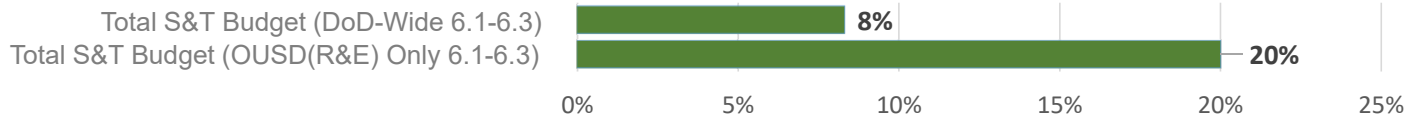
Total S&T Budget (DoD-Wide 6.1-6.3)

### FY23 PB to FY24 PB Total S&T Budget for OUSD(R&E) Up by 20%



Total S&T Budget (OUSD(R&E) Only 6.1-6.3)  
"OUSD(R&E)" includes Headquarters, DIU

### Percent Change

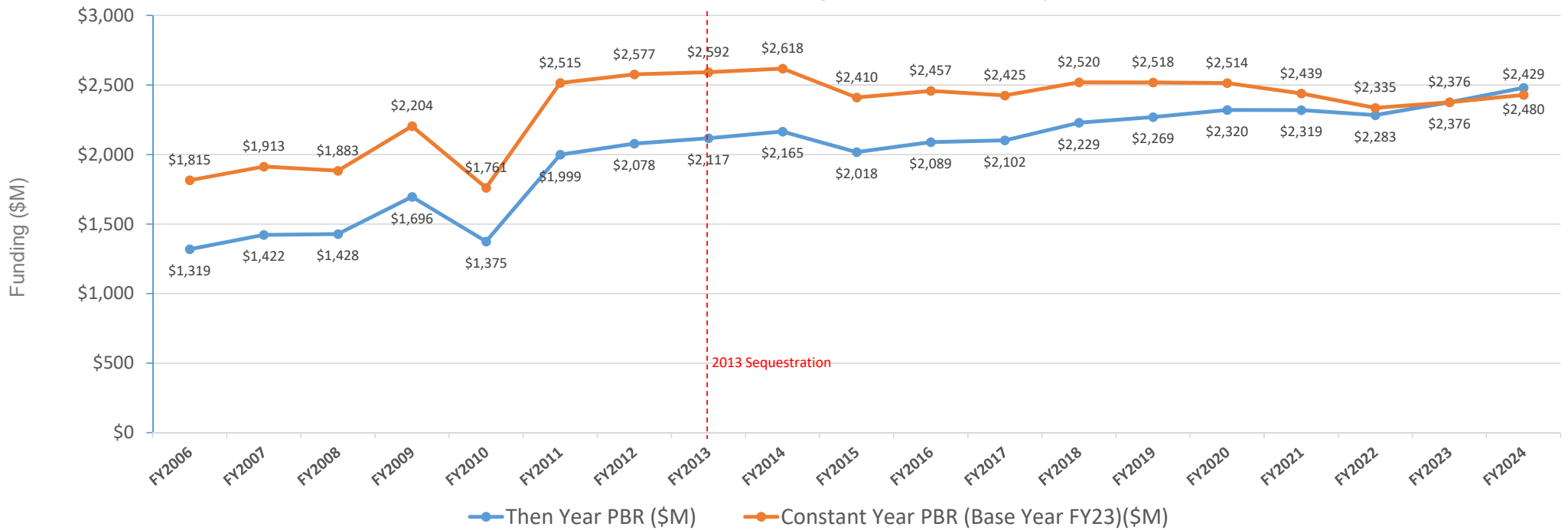




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# FY06-24 PBR DoD-Wide Basic Research (6.1) Funding Overview

**FY2023 PB to FY2024 PB**  
**Total Basic Research Budget DoD-Wide Up by 4%**



"DoD-Wide" includes "Defense-Wide" (aka, Fourth Estate) and Services.  
 "Defense-Wide"/"Fourth Estate" refers to OUSD(R&E) HQ, DIU, DARPA, SCO, MDA, and other Office of the Secretary of Defense agencies and field activities.  
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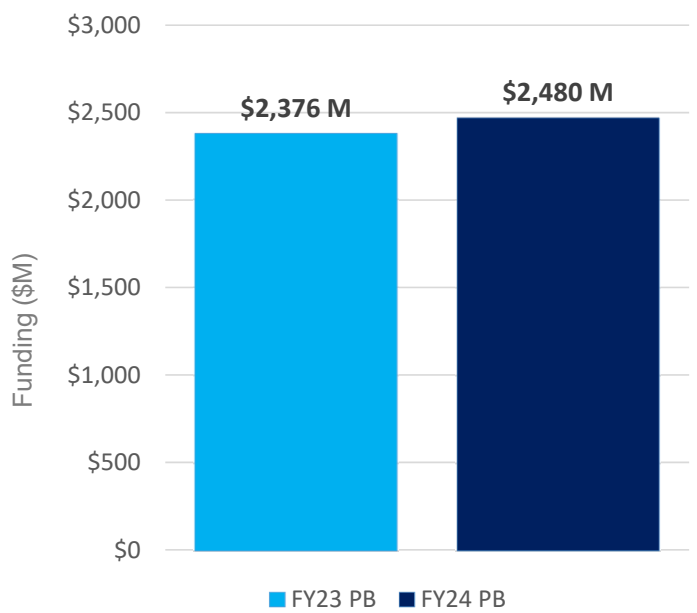




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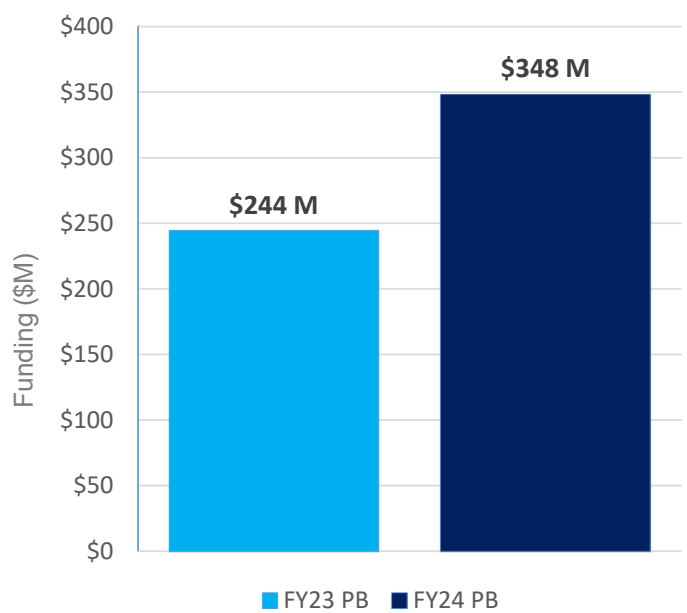
# FY24 Total Basic Research Budget (6.1) – Up 4% DoD-wide, 43% for OUSD(R&E)

### FY23 PB to FY24 PB Total Basic Research Budget DoD-Wide Up by 4%

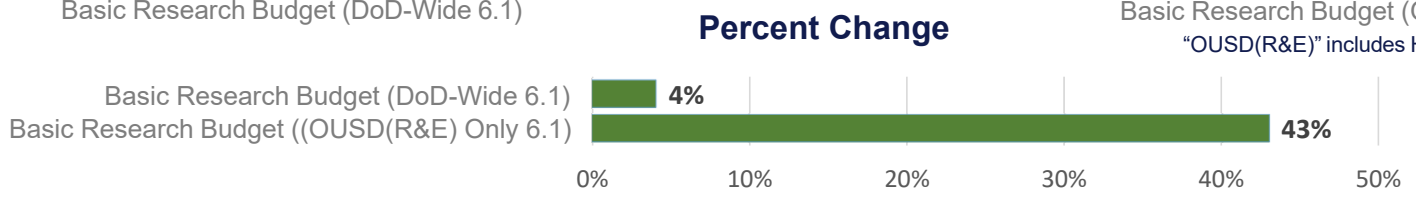


Basic Research Budget (DoD-Wide 6.1)

### FY23 PB to FY24 PB Total Basic Research Budget for OUSD(R&E) Up by 43%



Basic Research Budget (OUSD(R&E) Only 6.1)  
"OUSD(R&E)" includes Headquarters, DIU



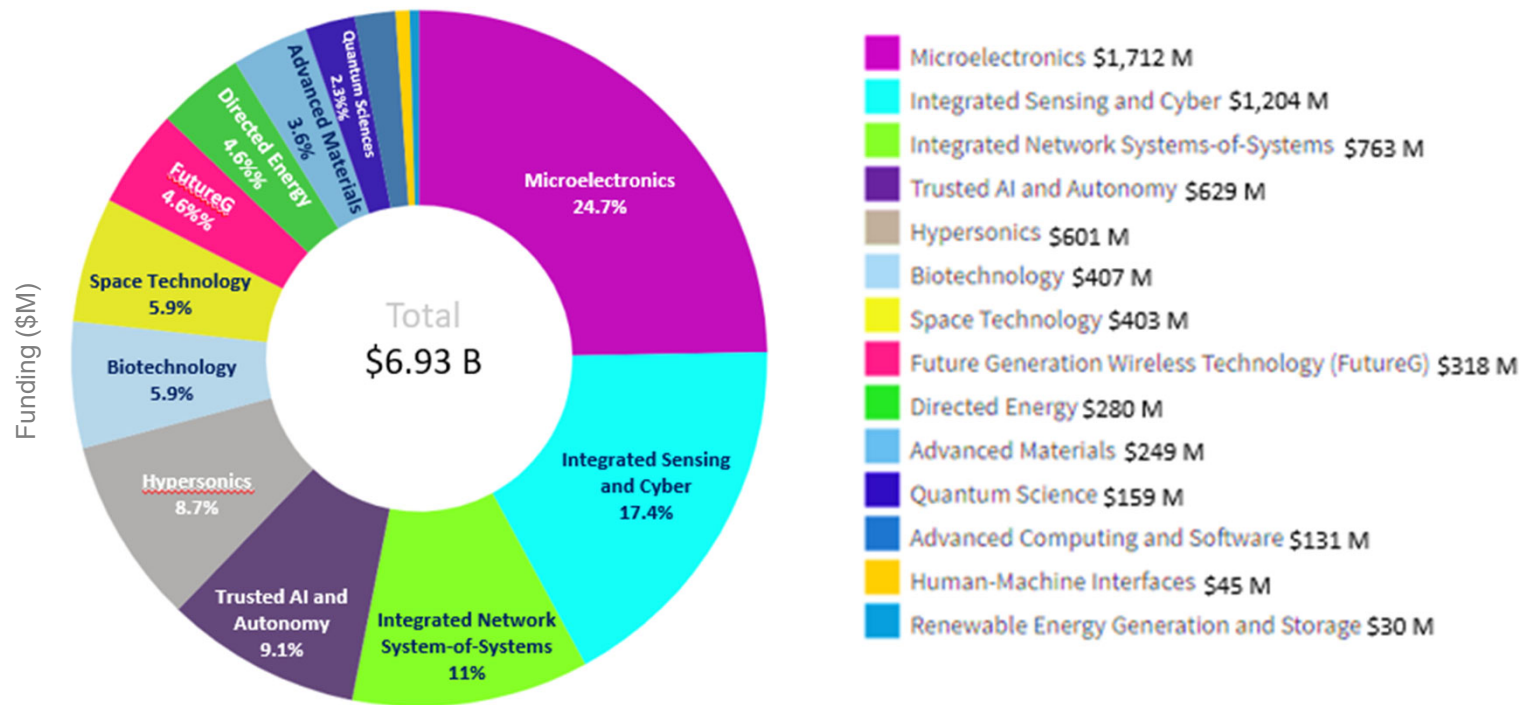


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# FY24 PBR OUSD(R&E) S&T and Prototyping Funding (BA 6.1-6.4) Overview

Includes OUSD(R&E) Headquarters, DARPA, DTIC, MDA, SCO, and TRMC

**FY24 PB OUSD(R&E) S&T and Prototyping Funding (BA 6.1-6.4) for CTAs:  
\$6.93B of \$17.62B Total OUSD(R&E) FY24 S&T and Prototyping PB Maps to CTAs**



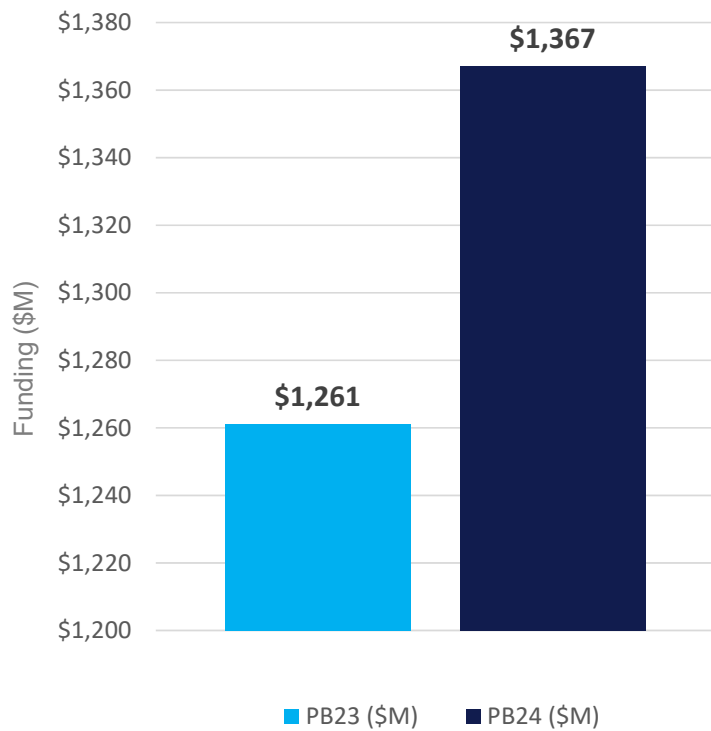
Total S&T and Prototyping Budget (OUSD(R&E)-Only 6.1-6.4)

"OUSD(R&E)" includes OUSD(R&E) Headquarters, DARPA, DTIC, MDA, SCO, and TRMC.  
Reflects best estimates by OUSD(R&E) PE Program Managers of spend by CTA.

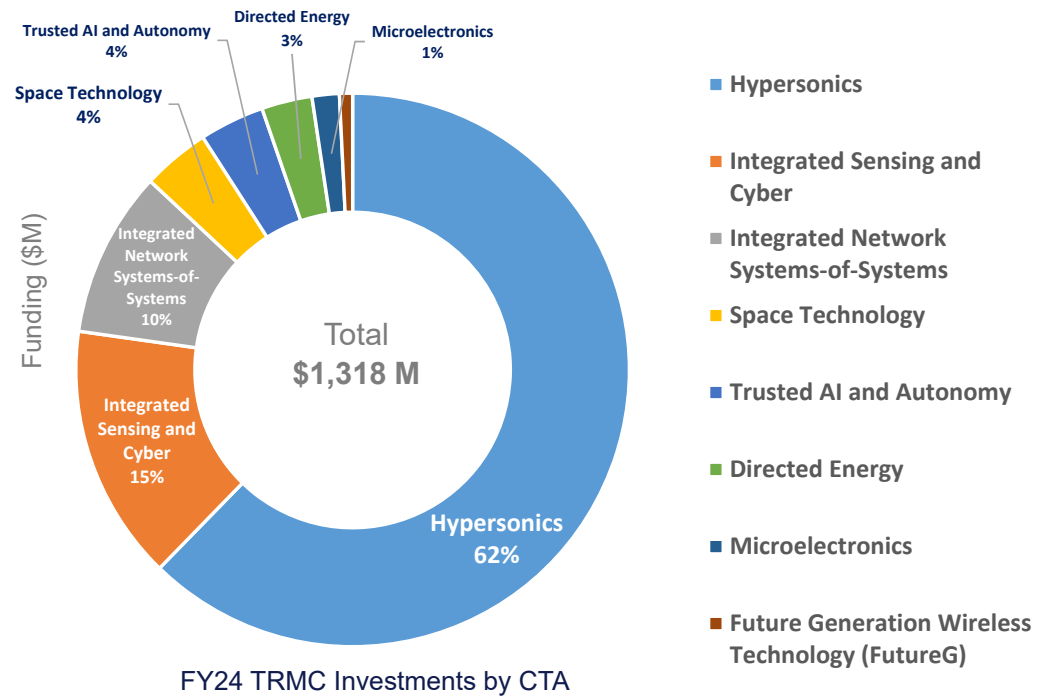


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# Test Resource Management Center



## \$1.32B of \$1.37B Total TRMC FY24 PB Maps to CTAs



- Central T&E Investment Program (BA6.6) up \$14M, including \$500M investment for Hypersonics
- T&E S&T (BA6.3) up \$30M
- Joint Mission Environment Test Capability (BA6.6) up \$61M, including \$80M investment for Integrated Network Systems-of-Systems

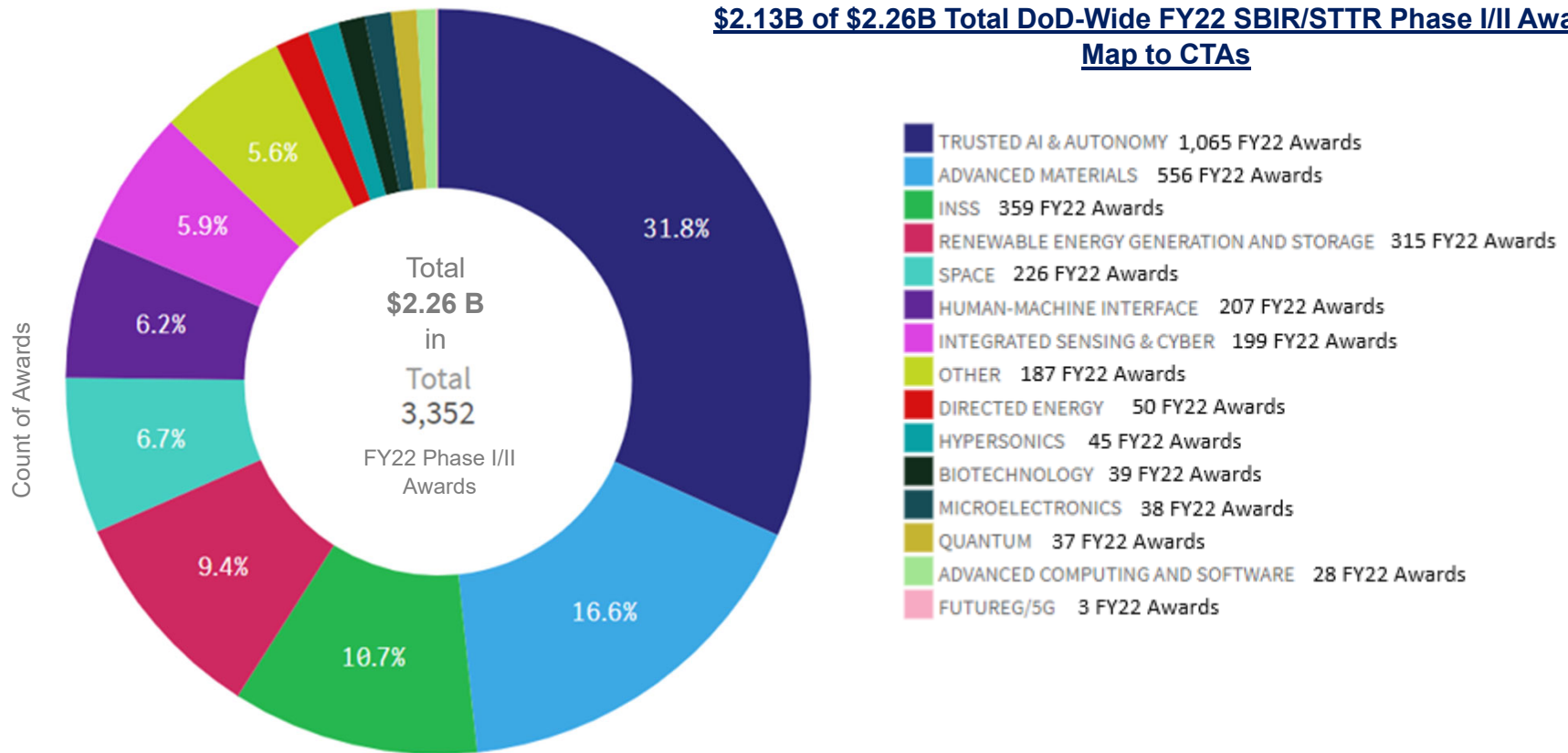
Reflects only OUSD(R&E) TRMC RDT&E Program Elements (PEs).  
Reflects best estimates by OUSD(R&E) PE Program Managers of spend by CTA.



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# FY22 DoD SBIR/STTR Phase I/II Awards Mapped to OUSD(R&E) CTAs

\$2.13B of \$2.26B Total DoD-Wide FY22 SBIR/STTR Phase I/II Awards  
Map to CTAs



DoD SBIR/STTR Phase I/II Awards Mapped to OUSD(R&E) Critical Technology Areas, FY 2022

Tagging by CTAs conducted by algorithm in beta-testing.

**Hon. Heidi Shyu**

**Under Secretary of Defense for Research and Engineering**

FY24 President's Budget Request - DoD Science, Technology, and Prototyping Priorities

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Washington, DC  
13 April 2023



# Office of the Assistant Secretary of the Army

## Acquisition, Logistics and Technology

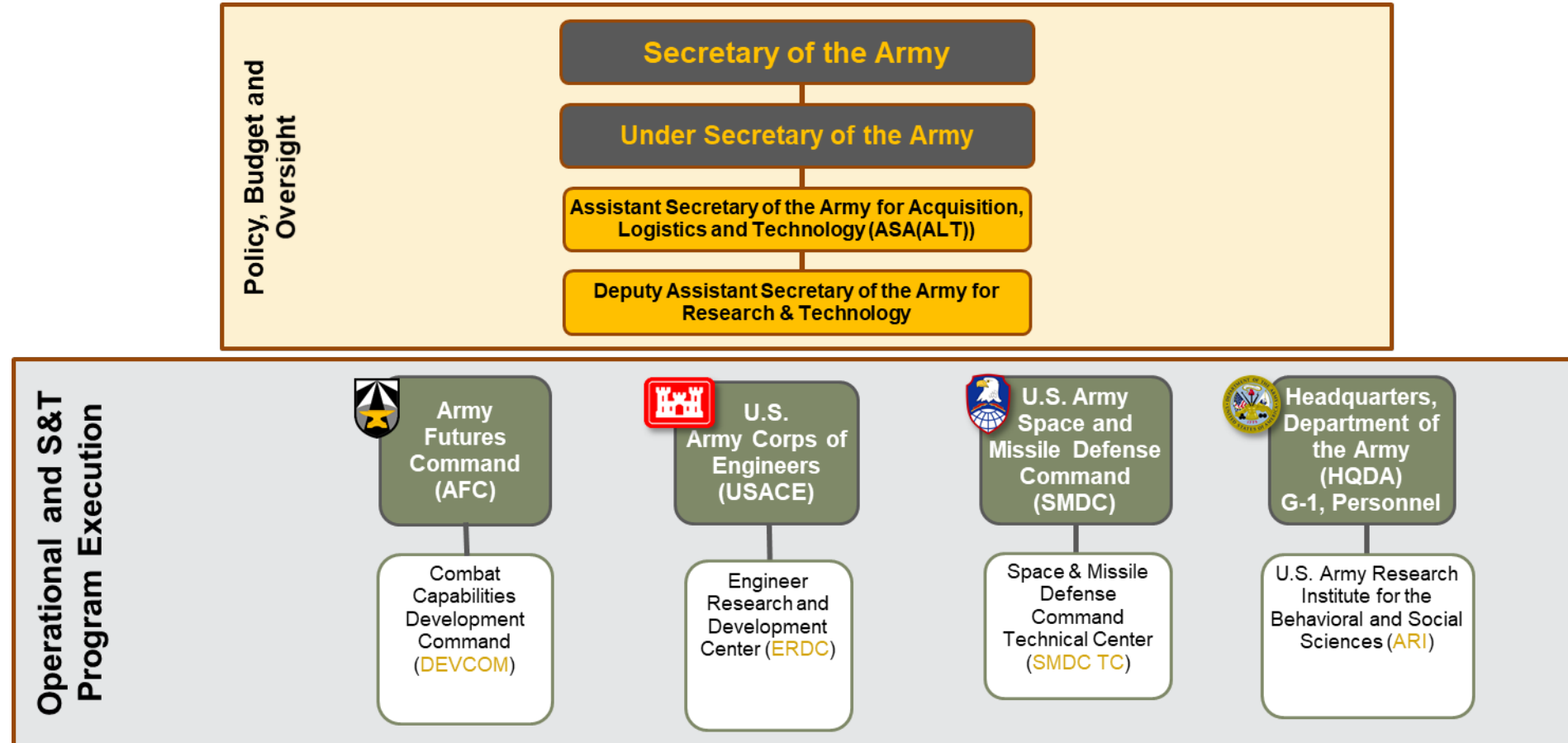


# Army Science and Technology PB24 Overview

William B. Nelson  
Deputy Assistant Secretary of the Army  
for Research and Technology



DESIGN • DEVELOP • DELIVER • DOMINATE  
SOLDIERS AS THE DECISIVE EDGE



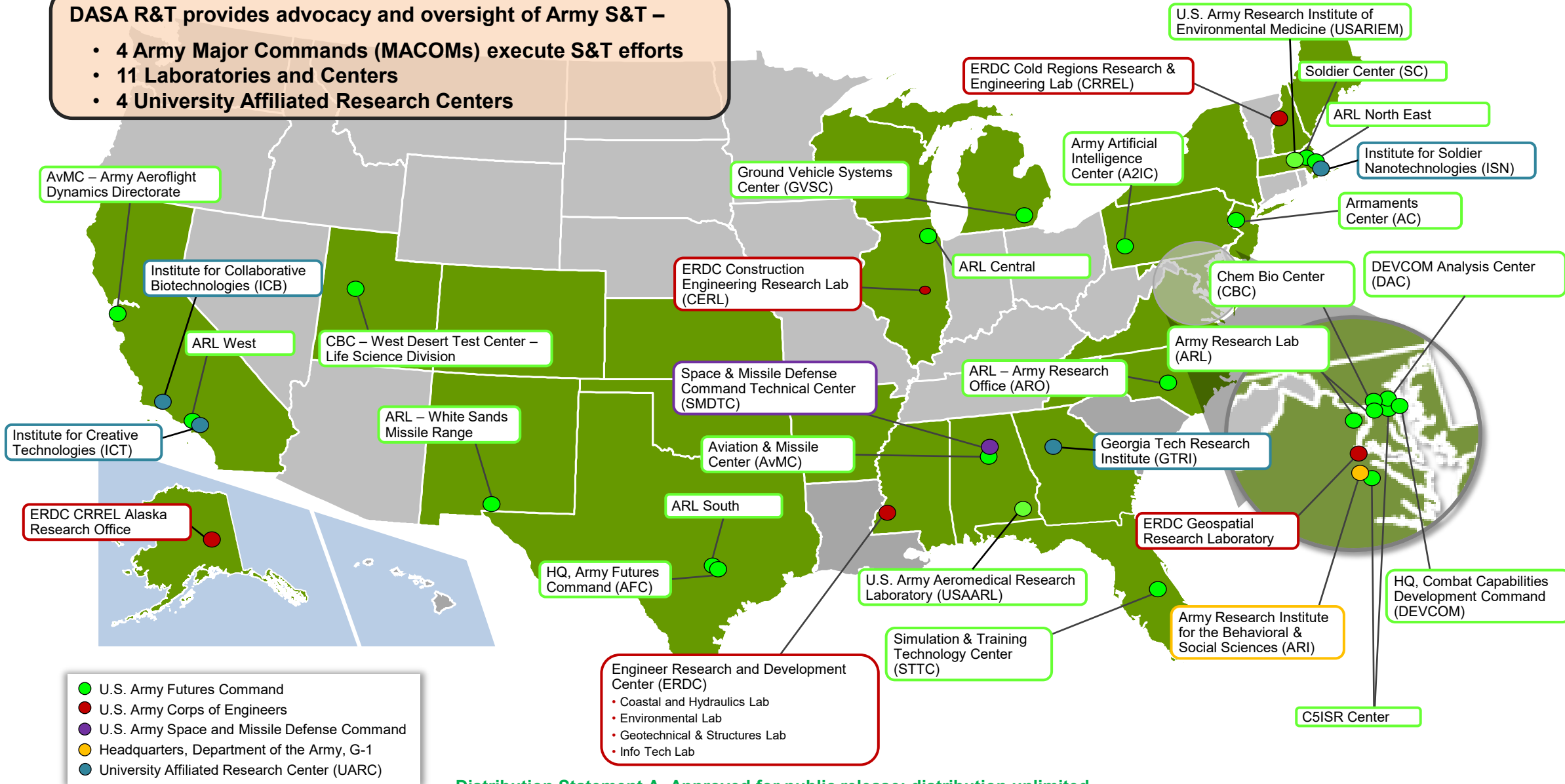


# Army S&T Enterprise: Centers & Labs

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DASA R&T provides advocacy and oversight of Army S&T –

- 4 Army Major Commands (MACOMs) execute S&T efforts
- 11 Laboratories and Centers
- 4 University Affiliated Research Centers









- Engineer Research and Development Center (ERDC)
  - Coastal and Hydraulics Lab
  - Environmental Lab
  - Geotechnical & Structures Lab
  - Info Tech Lab

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## Army Modernization Priorities

<b>Long Range Precision Fires</b>  Strategic Fires Operational Fires Tactical Fires	<b>Next Generation Combat Vehicle</b>  Lethality Robotics and Autonomous Systems Armor and Active Protection Ground Vehicle Platforms	<b>Future Vertical Lift</b>  CS1 (Attack Recon) Future Unmanned Aircraft System Modular Open Systems Approach FVL CS3 (Long Range Assault)	<b>Network</b>  Unified Network Common Operating Environment Command Post Cyber	<b>Air &amp; Missile Defense</b>  Indirect Fire Protection Capability Maneuver – Short Range Air Defense (M-SHORAD)	<b>Soldier Lethality</b>  Lethality Situational Awareness Protection Survivability Mobility Human Performance/ Training Personnel Research & Talent Management
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## Key Focus Areas

<b>Assured Positioning, Navigation and Timing</b> <ul style="list-style-type: none"> <li>Ground</li> <li>Aviation</li> <li>Precision Weapons</li> </ul>	
<b>Synthetic Training Environment</b> <ul style="list-style-type: none"> <li>STE Information Systems</li> <li>Family of Virtual Trainers (Individual and Collective)</li> <li>Future Live and Constructive Synthetic Training Environments</li> </ul>	
<b>Electronic Warfare</b> <ul style="list-style-type: none"> <li>Electronic Attack</li> <li>Electronic Support</li> <li>Electronic Protect</li> </ul>	
<b>Sensing &amp; Intelligence</b> <ul style="list-style-type: none"> <li>Space</li> <li>Deep Sensing</li> <li>Data Analysis/Analytics</li> <li>Aided Target Recognition Technologies</li> </ul>	
<b>Contested Logistics &amp; Sustainment</b> <ul style="list-style-type: none"> <li>Delivery and Support Systems</li> <li>Automated/Predictive MNX &amp; Sustainment Tech</li> <li>BioTech and Forward Deployed Manufacturing</li> </ul>	

## Enabling

<ul style="list-style-type: none"> <li>Energetics &amp; Propulsion</li> <li>Lethality &amp; Warheads</li> <li>Armament Technology</li> <li>Hypersonic Technology</li> </ul>	<ul style="list-style-type: none"> <li>Force Projection</li> <li>Force Protection</li> <li>Autonomy &amp; AI</li> <li>Materials</li> <li>Power</li> </ul>	<ul style="list-style-type: none"> <li>Platform Design</li> <li>Powertrain &amp; Propulsion</li> <li>Aircraft Survivability</li> <li>Aircraft Mission Systems</li> <li>Unmanned Systems &amp; Autonomy</li> </ul>	<ul style="list-style-type: none"> <li>Network Resiliency</li> <li>Cyber Defense</li> </ul>	<ul style="list-style-type: none"> <li>Solid State Laser Tech</li> <li>Radar Technology</li> </ul>	<ul style="list-style-type: none"> <li>Intelligent Weapons</li> <li>Adaptive AI for SA and Enhanced Decision Making</li> <li>Soldier Power &amp; Energy</li> <li>Training &amp; Performance Tech</li> </ul>
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### Army Priority Research Areas

- Disruptive Energetics
- RF Electronic Materials
- Quantum
- Hypersonic Flight
- Artificial Intelligence
- Autonomy
- Synthetic Biology
- Material by Design
- Science of Additive Manufacturing

### Army Priority Crosscutting

- Military Operational Medicine
- Power and Energy
- Climate

### Transition

- Science and Technology Objectives (STO)
- Technology Maturation Initiatives (TMI)
- Manufacturing Technology (ManTech)

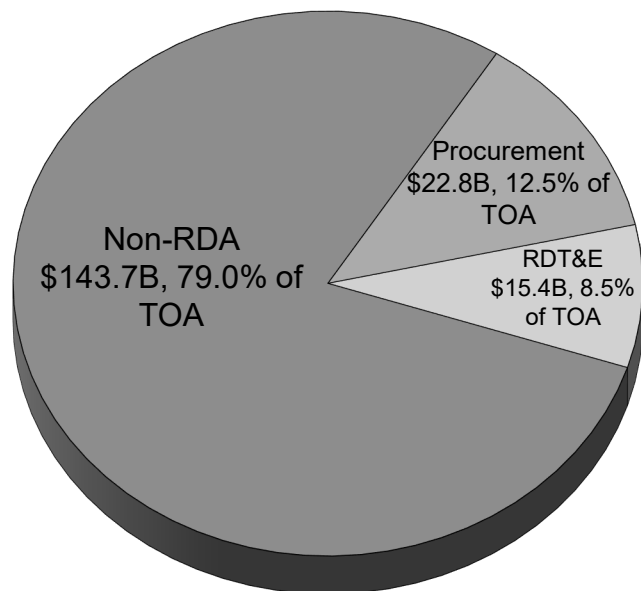
### Programs Managed on Behalf of DoD

- High Performance Computing Modernization Program
- Counter-Improvised Explosive Devices R&D
- T-BRSC
- Combat Feeding Research and Engineering Program
- Humanitarian Demining
- Joint Services Small Arms Program
- C-sUAS



## Total Obligation Authority (TOA)

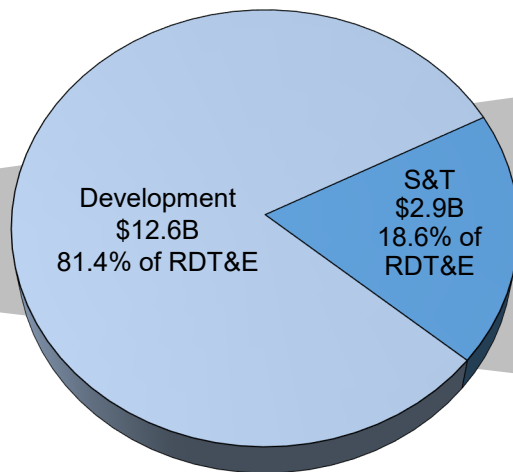
**\$182.0B**



**FY23**  
**\$177.5B**

## Research, Development Test & Evaluation (RDT&E)

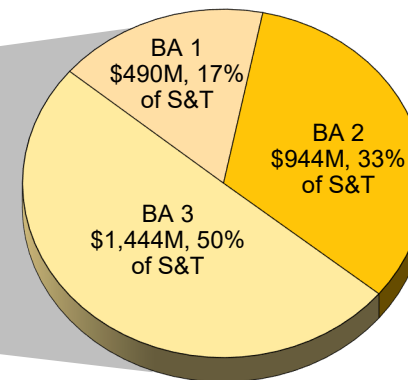
**\$15.4B**



**FY23**  
**\$13.7B**

## Science & Technology (S&T)

**\$2.9B**



**FY23**  
**Core \$2.7B /**  
**Congressional Adds**  
**\$2.2B**



## Other S&T Programs

## HPCMP

- High Performance Computing Modernization Program (DoD), Procurement

## Basic Research

- Materials Science; Quantum/Info Science; AI, Autonomy & Robotics; Networks; Synthetic Biology, Biotech & Life Sciences; Training/Human Sciences; Neuroscience

## Manufacturing Technology

## Innovation Technology

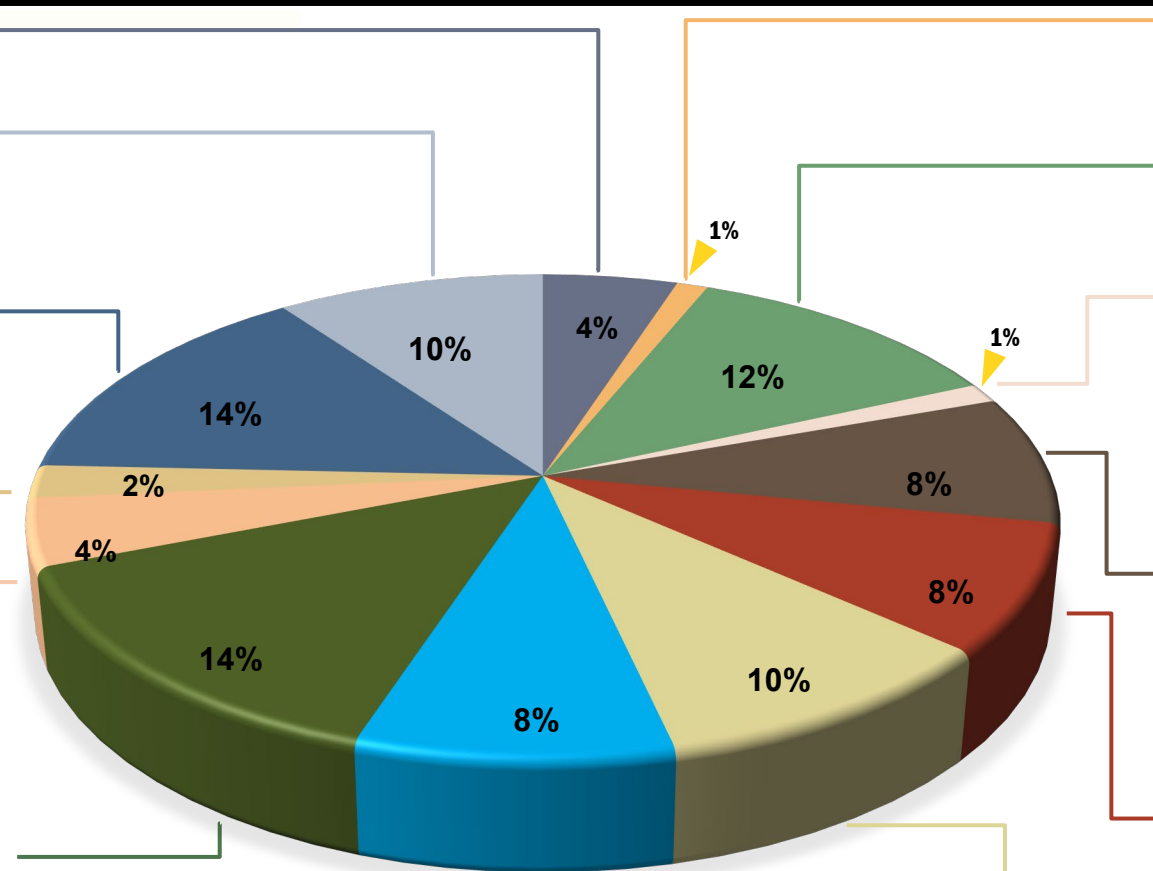
- University Technology Development Directorate, Army Applications Lab, AI Center, Sensor-Shooter Integration, Advancing Concepts & Tech Forecasting, Counter Explosive Hazards

## Ground Combat Vehicle

- NGCV Lethality
- NGCV Robotics and Autonomy
- NGCV Armor and Active Protection
- NGCV Platforms, Electrification and Mobility
- Ground Enabling Technology

## Future Vertical Lift

- Platform Development and Demonstration
- Power and Propulsion Systems
- Maintainability and Sustainability
- Aviation Concept Design and Assessment
- Integrated Mission Systems



## Management Support

- Technical Information Activities
- Army Science Board

## Maturation

- Technology Maturation Initiatives (TMI)
- Army Experimentation and Prototyping
- RDER

## Air and Missile Defense

- Smaller & Cheaper Missiles
- High Energy Lasers
- Gun Based Counter-Tactical & Small UAS
- Advanced Seekers
- Advanced Energetics & Propulsion
- Radars

## Long Range Precision Fires

- Propulsion for Extended Range Missiles
- Extended Range Cannon Artillery
- Enhanced Guidance/Navigation for Weapons
- Advanced Energetics
- Advanced Warheads for Cluster Munitions

## Network/C3I

- Tactical Communications
- Mission Command
- Cyber Electromagnetic Activities
- Assured Position, Navigation & Timing
- Persistent ISR

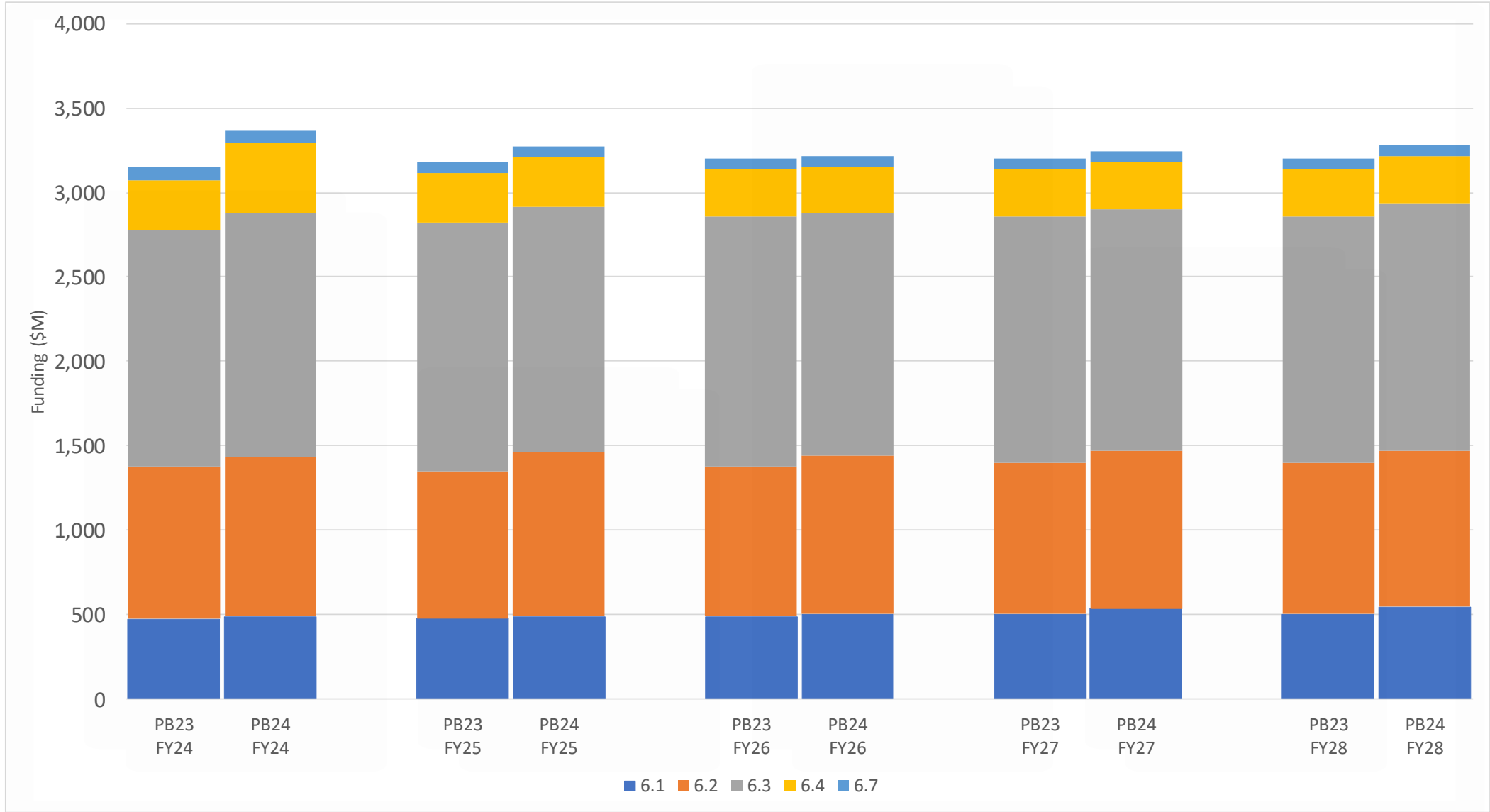
## Soldier & Squad

- Soldier-borne Interfaces, Integration, and Power
- Situational Awareness, Small Arms, and Protection
- Synthetic Training Environment (STE)
- Personnel Research
- Biotech for Resilient Supply Chain and Materials



# PB24 Funding Shifts by Budget Activity

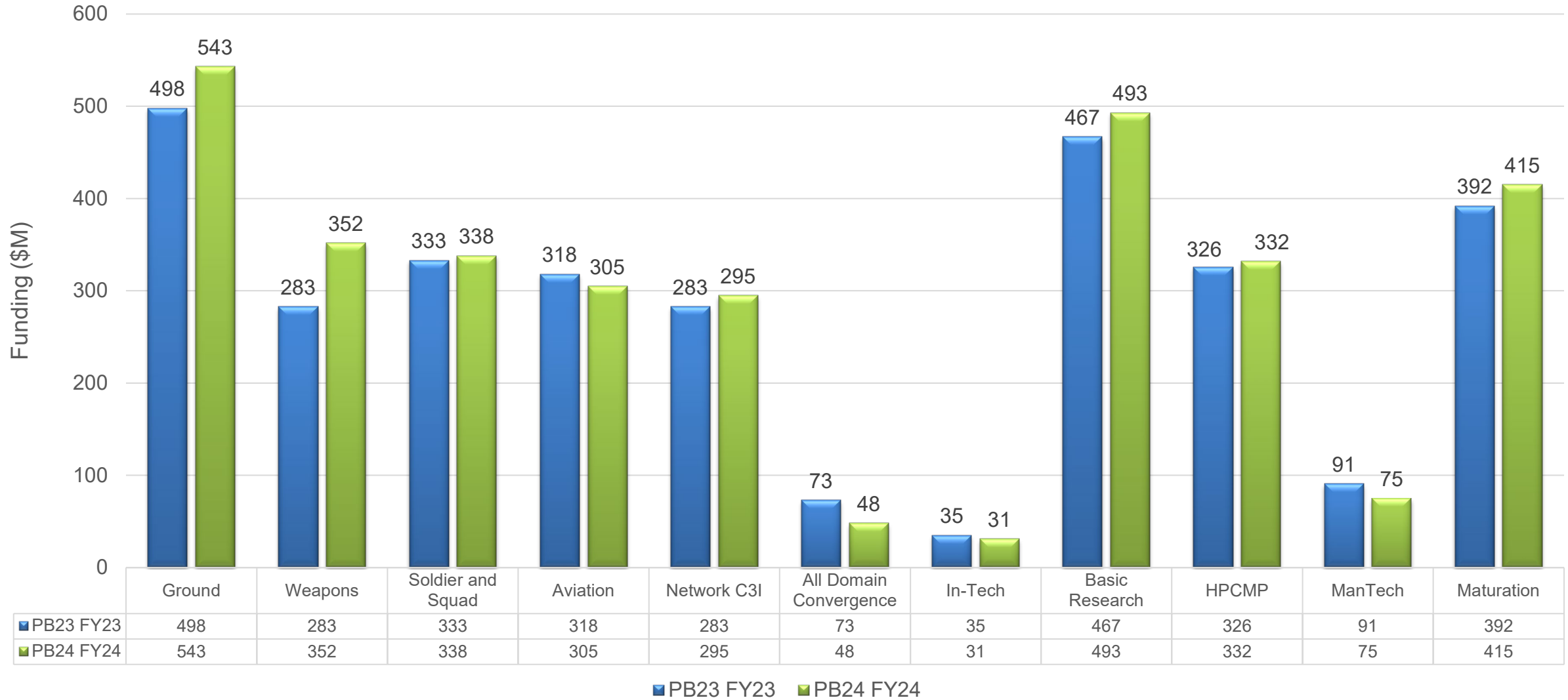
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## PB23 (FY23) to PB24 (FY24)





# INCENTIVIZING ARMY INTEGRATORS

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In October 2022, HON. Camarillo, Under Secretary of the Army, announced pilot initiatives to incentivize major weapons systems integrators to collaborate and integrate technologies from small and nontraditional innovation firms:

## xTech Prime

- Small businesses paired with prime contractors to develop technology prototypes
- Collaboration and integration into existing integrator-managed projects
- **Awards:** Cash prizes, Direct to Phase II SBIR awards up to \$2.0 million

## Army SBIR CATALYST

- Matching SBIR funds with Army acquisitions funds and Prime Integrator funds
- Transition of SBIR prototypes in support of the Army of 2030
- **Awards:** Phase II SBIR awards up to \$15 million for prototype development, maturation/risk reduction, and demonstration

## Army Tech Marketplace

- On-demand portal to connect small businesses, prime contractors, the Army and technology developers
- Collaboration opportunities with minimized transition risk and faster innovation
- Greater awareness and transparency amongst key players to transition technology to the Soldier

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A **Technology Transition** occurs when project deliverables developed under an S&T project completes development and demonstration and are incorporated into current or planned programs, transferred to industry/other government agencies, or informs CONOPS/requirements, and the outcomes are codified.

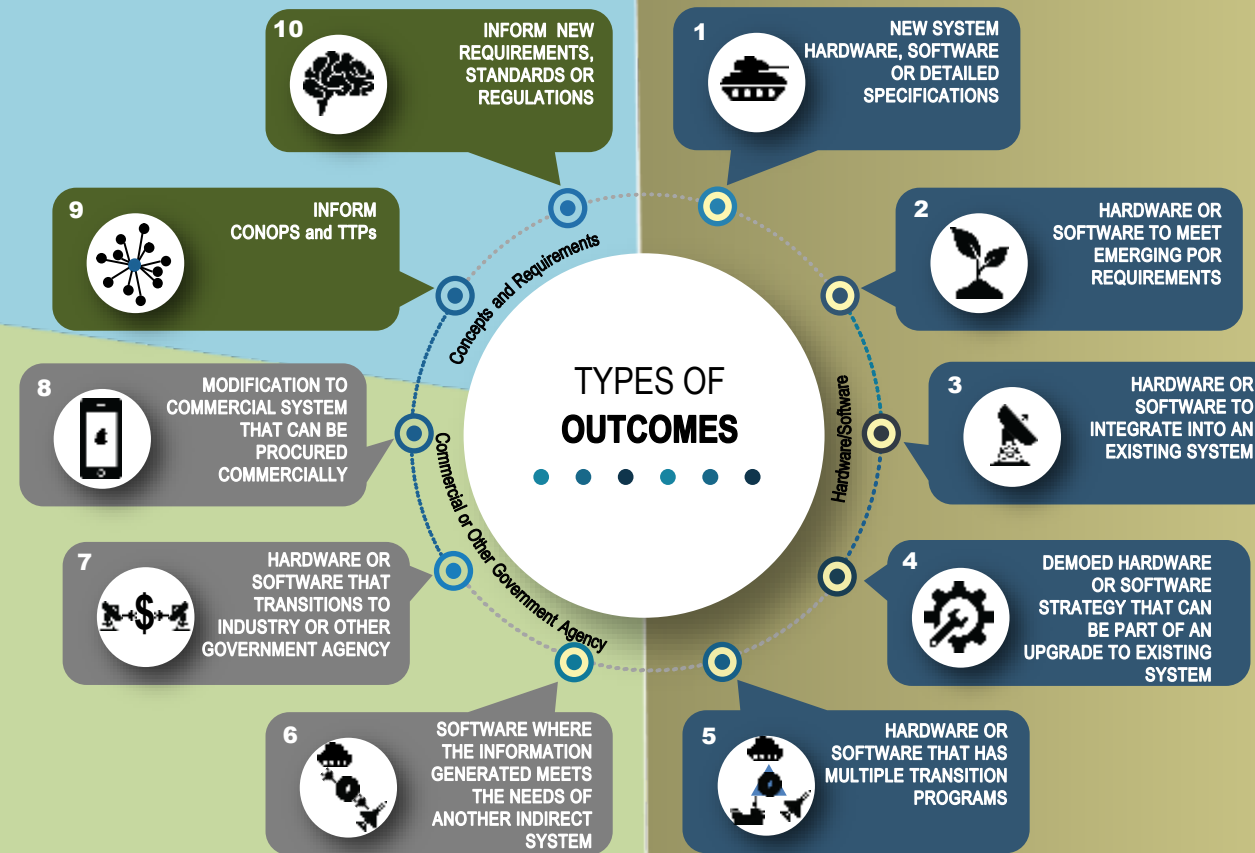
### **3 Technology Transition Categories:**

**Transition Hardware/Software to Program:** Insertion of hardware/software into an existing program or fielding a new capability (*Examples: DE-MSHORAD, LRHW, and PrSM Inc 2 Seeker*)

**Transition to Industry or Other Government Agency:** Technology developed by the science technology developer is tech transferred to commercial industry or other government agencies (*Example: Next Generation Squad Weapon TDP and LC-TERM high-resin rocket motor*)

**Transition Informs Concepts and Requirements:** Informs Future Warfighting Concepts, TTP and CONOP Development, Updates Specifications, MIL-Standards and Requirements. (*Examples: Next Gen Family of Ammunition 6.8mm, Projectile Projection and Fragment Penetration Research, MOSA Standards*)

# Types of Technology Transition



## USD(RE) Definition

- Fielding new capability
- Insertion of the technology into a Department of Defense program
- Follow-on technology maturation program
- Software implemented on existing system

## USD(RE) Definition

- Transitioned to other Government Agency
- Transitioned to industry (defense or commercial)

<b>1</b> Design, develop and produce new system hardware, software or detailed specifications that the program of record can use for acquisition.	<b>2</b> Design, develop and produce new hardware or software and integrate it into a pre-existing system to meet emerging or objective requirements.	<b>3</b> Develop or modify hardware or software in order to upgrade or improve on an existing system.	<b>4</b> Develop a new hardware/software technology upgrade strategy that a program manager can use for a program of record.	<b>5</b> Hardware or software that can transition to multiple programs of record.
<b>6</b> Develop system or software that can transition or meet the needs of multiple indirect systems or programs	<b>7</b> Hardware or software that is transitioned to industry or another government agency which includes Army and other service labs.	<b>8</b> When a commercial system is modified to meet program of record needs.	<b>9</b> Transitioning the technical knowledge to inform TTPs, future concepts and con-ops development	<b>10</b> Technology knowledge used to develop new requirements, standards or regulations





# ***NDIA Budget Panel 2023***

**RADM Lorin Selby  
Chief of Naval Research**



**NRE**  
NAVAL RESEARCH ENTERPRISE

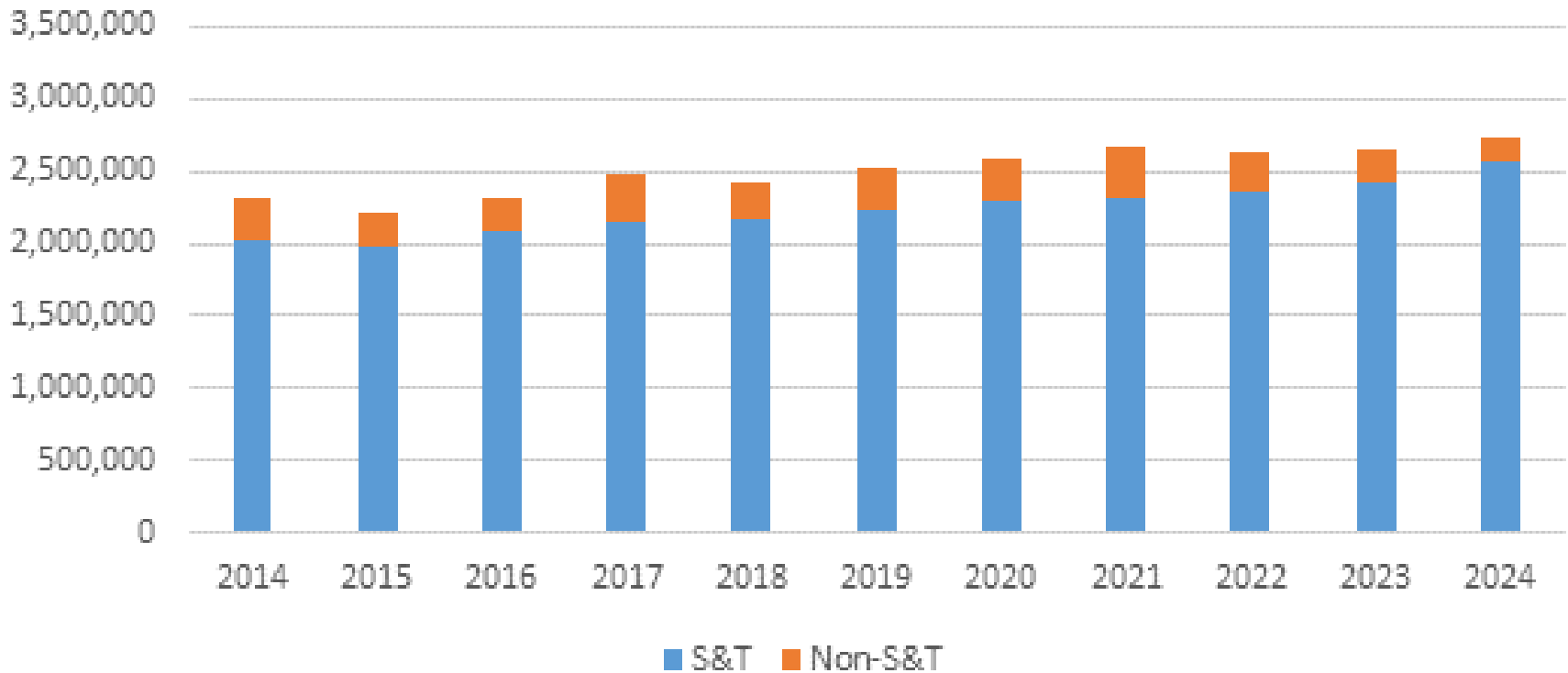
# The Naval Research & Development Establishment (NR&DE)





# NRE Portfolio Investment

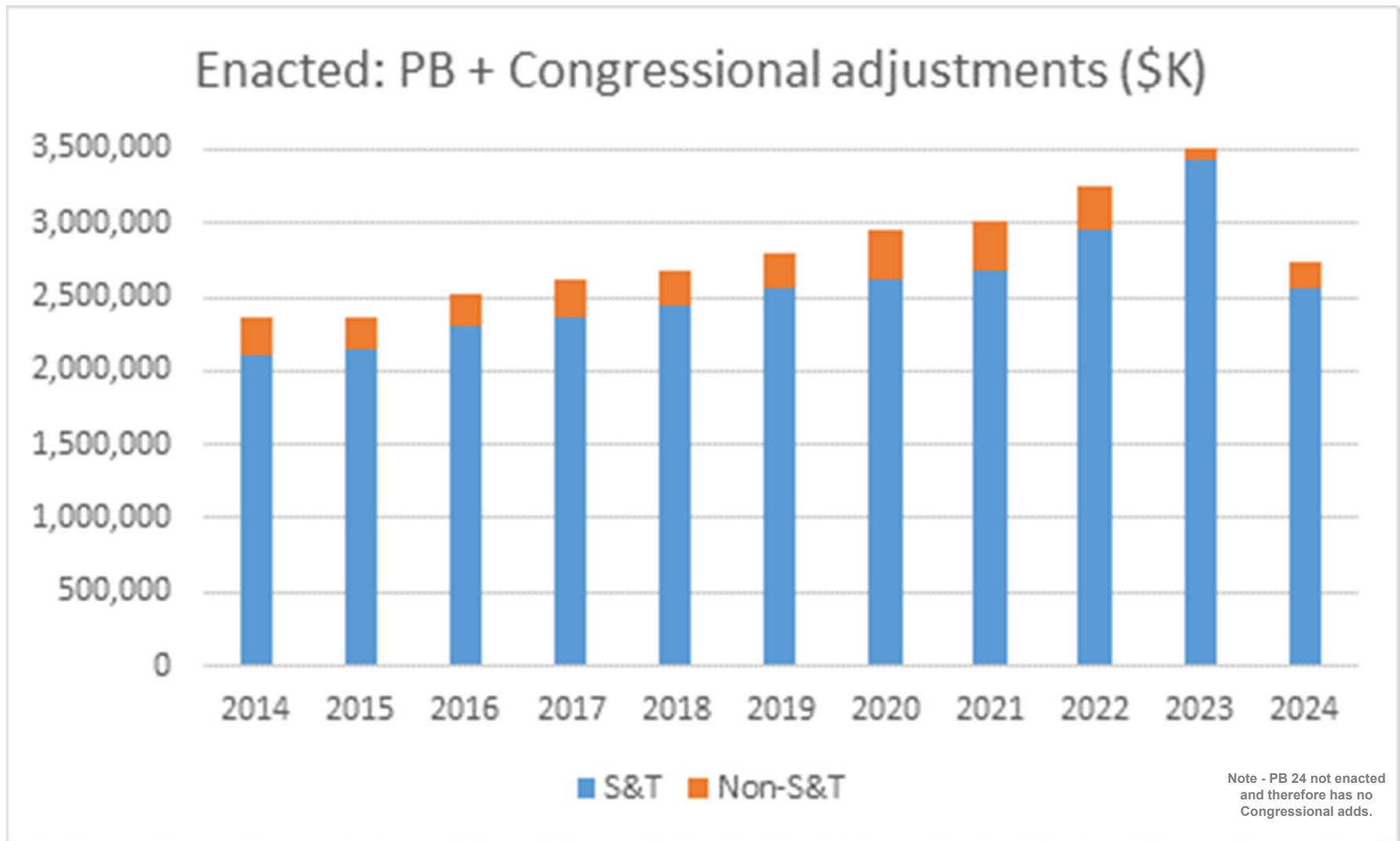
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**NRE**  
NAVAL RESEARCH ENTERPRISE

# NRE Portfolio Investment



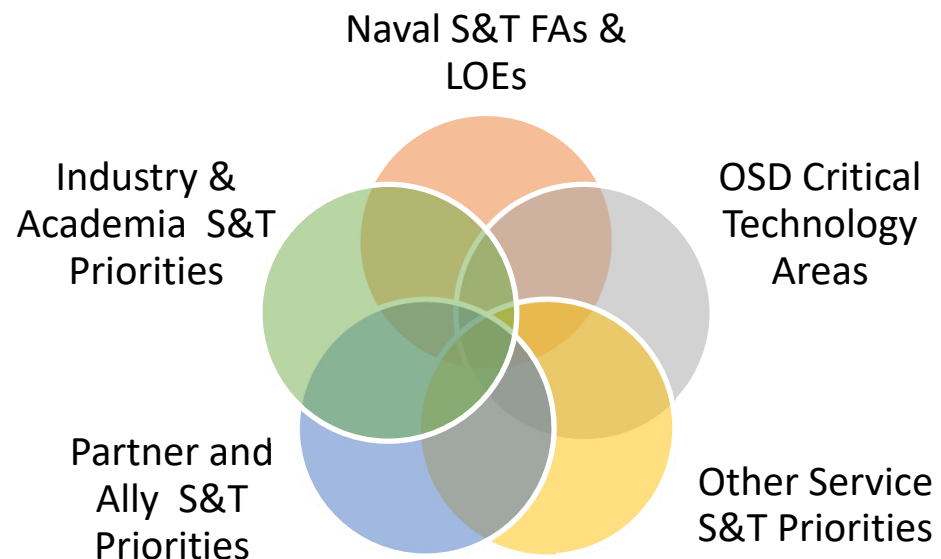


**NRE**  
NAVAL RESEARCH ENTERPRISE

# 30- Year Naval S&T Strategy

- As the Naval S&T provider the NRE must focus on Naval problems, concepts, and capabilities.
- As a DOD S&T organization the NRE must use and contribute to OSD Critical Technology Areas (CTAs).
- The Strategy is designed to take back our technological advantage and will be continuously reassessed.
  - It identifies and defines Focus Areas (FAs) and introduces Lines of Effort (LOEs).
  - It calls for an S&T Infrastructure and Workforce Assessment

Coordination and communication to maximize CTA progress while addressing service unique S&T





# Naval S&T Workforce Assessment

**Maintaining high quality naval S&T requires a well-educated, highly experienced, and motivated workforce.**

- Build tomorrow's PhDs, Scientist's, and Engineers:
  - Program Officers
  - Principal Investigators
  - STEM
  - Build relationships
- Support government, academic, and commercial workforce
- Understand:
  - How to attract and retain S&T personnel
  - How to leverage industry and academia
  - How to leverage the other Services to prevent duplicity

**CANNOT SURGE SCIENTISTS**



# Naval S&T Infrastructure Assessment

- **Identifying S&T infrastructure requirements is essential to implementing the strategy.**
  - We must have the ways and means to physically accomplish the execution of our strategy.
- **FAs and LOEs Drive the Infrastructure Requirements**
- **Physical & Digital**
  - Maintenance of existing facilities
  - Investments in new facilities
  - Special Equipment
    - Quantum
    - AI/ML
    - Cyber
    - Nano technology
    - Biotechnology
    - Hypersonics
- Can we leverage industry/academia and/or other DoD entities?

**CRITICAL CAPABILITY and CRITICAL VULNERABILITY**



**NRE**  
NAVAL RESEARCH ENTERPRISE

# The Future United States Workforce



- Sponsored 480 college NREIP and 180 high school SEAP STEM interns, 20 JROTC Flight Academy students, more than 1,000 Naval Horizons STEM essay contest awards, and the Annual RoboSub competition with 39 teams from 11 countries.
- Funded six HBCU/MI Distinguished Fellows enabling them to focus exclusively on naval-relevant research, write academic papers and abstracts, and engage and receive mentorship with naval scientists and engineers

“Science, Technology, Engineering and Mathematics (STEM) recruiting efforts play a critical role in supporting Defense Department national security efforts and enables the United States to remain an economic and technological leader.”





U.S. AIR FORCE



# AFRL

## Strategic Warfighting Advantage Starts with S&T

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MAJOR GENERAL HEATHER L. PRINGLE, PHD

COMMANDER, AIR FORCE RESEARCH LABORATORY

TECHNOLOGY EXECUTIVE OFFICER, DEPARTMENT OF THE AIR FORCE

# LEAD. DISCOVER. DEVELOP. DELIVER.

Warfighter Capability for America's Air & Space Advantage



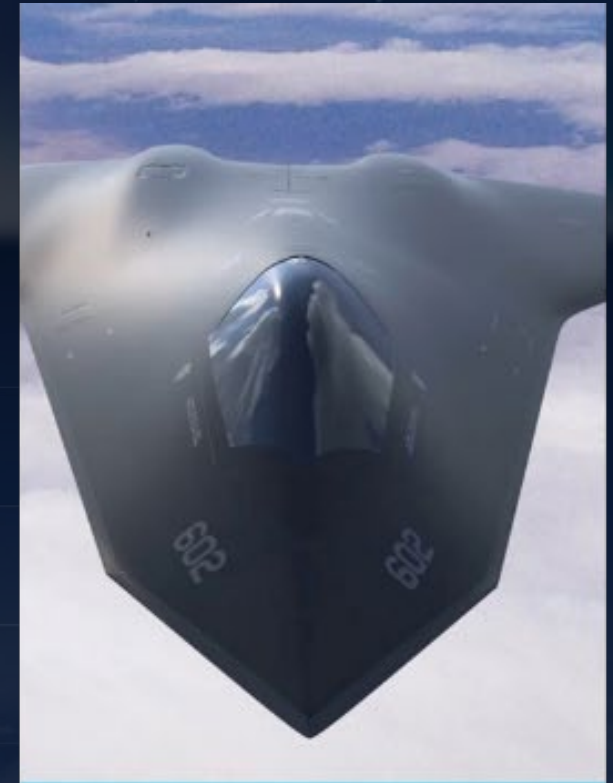
SCIENCE



TECHNOLOGY



PROTOTYPING / EXPERIMENT



WARFIGHTER CAPABILITY

# ONE AFRL, TWO SERVICES



U.S. AIR FORCE



DAF Technology Executive  
Officer for Air and Space

Maj Gen Heather Pringle

THE AIR FORCE



U.S. AIR FORCE



Deputy Technology Executive  
Officer for Space

Dr. Andy Williams

Space Capstone Publication  
SPACEPOWER  
DOCTRINE FOR SPACE FORCES



UNITED STATES  
SPACE FORCE



# OUR TEAM & LOCATIONS

## 5 CSTARS Sites

Baltimore, Cincinnati,  
Dayton, Omaha, and St.  
Louis

## 1 SMART Site

Las Vegas

# AFRL

Rome, NY

Information (RI)

Wright Patterson AFB, OH

AFRL Headquarters

711th Human Performance Wing (711 HPW)

Aerospace Systems (RQ)

Materials & Manufacturing (RX)

Integrated Capabilities (RS)

Sensors Directorate (RY)

Systems Technology Office (STO)

Washington D.C.

AFWERX (RG)

Arlington, VA

AF Office of Scientific Research  
(AFOSR)

Las Vegas, NV

AFWERX (RG)

Edwards AFB, CA

Aerospace Systems (RQ)

Las Angeles, CA

SpaceWERX (RG)

Arnold AFB, TN

Aerospace Systems (RQ)

Maui, HI

Directed Energy (RD)

Albuquerque, NM

Directed Energy (RD)

Space Vehicles (RV)

Eglin AFB, FL

Munitions (RW)

Austin, TX

AFWERX (RG)

Ft Sam Houston, TX

711 HPW

## International Sites

London, UK

Tokyo, Japan

Santiago, Chile

Sao Paulo, Brazil

Melbourne, Australia



# A Strategic Military & Technological Competition is Here

## Aggressive Military Actions & Modernization

Russia's Anti-Satellite Weapons: An Asymmetric Response to U.S. Aerospace Superiority

ARMS CONTROL TODAY

EurAsian Times

China's 'Carrier-Killer' & Russia's 'Super-Weapon' – Why Ripples In The West?

INDEPENDENT NEWS  
China tests army of tiny drone swarm' enemies during sea

NATIONAL SECURITY  
U.S. takes down a Chinese spy balloon off the South Carolina coast

npr  
Ripples In The West?

Chinese AI Learns To Beat Top Fighter Pilot In Simulated Combat

politics  
Top military leader says China's hypersonic missile test 'went around the world'

Newsweek  
China's Moon Base to Rival NASA Advances After Russia Deal

THE DRIVE  
China Acquiring New Weapons Five Times Faster Than U.S. Warns Top Official

THE U.S. Sun  
ATTACK OF THE DRONES US...  
Budget calls for fastest increase since 2019 as tensions grow over Taiwan

Backgrounder: China's Age

THE WALL STREET JOURNAL

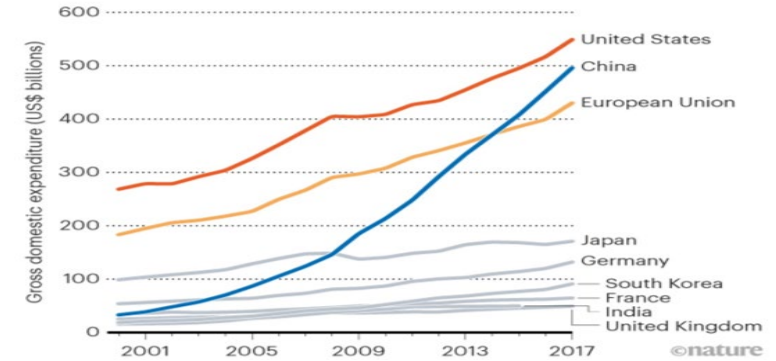
WIRED  
Russian Missiles and Space Debris Could Threaten Satellites

the growing debris in low Earth orbit is a matter of national security.

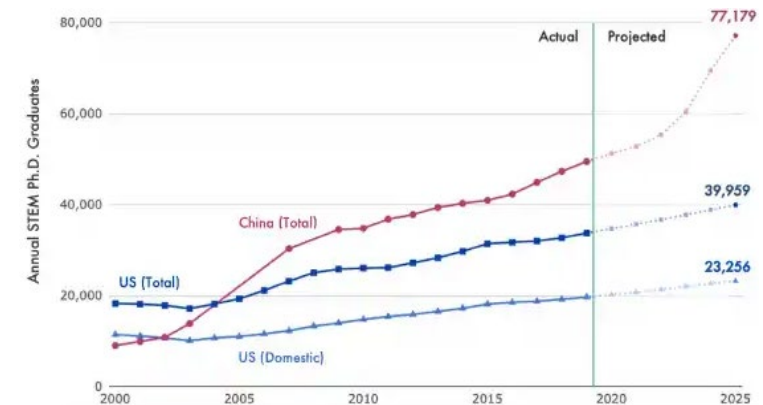
THE WARZONE  
China's Big New Twin-Jet Long-Endurance Armed Combat Drone Emerges

## R&D Investments Rate Increase per Year

SCIENCE SPENDING  
China is catching up to the United States on funding for research and development.



## Higher Education Graduation Rates



# Advancing Science & Technology is More Important Than Ever



# Department of the Air Force Operational Imperatives

## All-Hands-On-Deck!



**SPACE ORDER OF BATTLE**



**OPERATIONALLY-FOCUSED ABMS**



**MOVING TARGET ENGAGEMENT**



**NGAD FAMILY OF SYSTEMS**



**RESILIENT FORWARD BASING**



**B-21 FAMILY OF SYSTEMS**



**READINESS TO MOBILIZE, DEPLOY & FIGHT**

**ELECTROMAGNETIC SPECTRUM OPERATIONS**

**MOBILITY**

**WEAPONS**



# Operational Imperatives Through the Lens of S&T

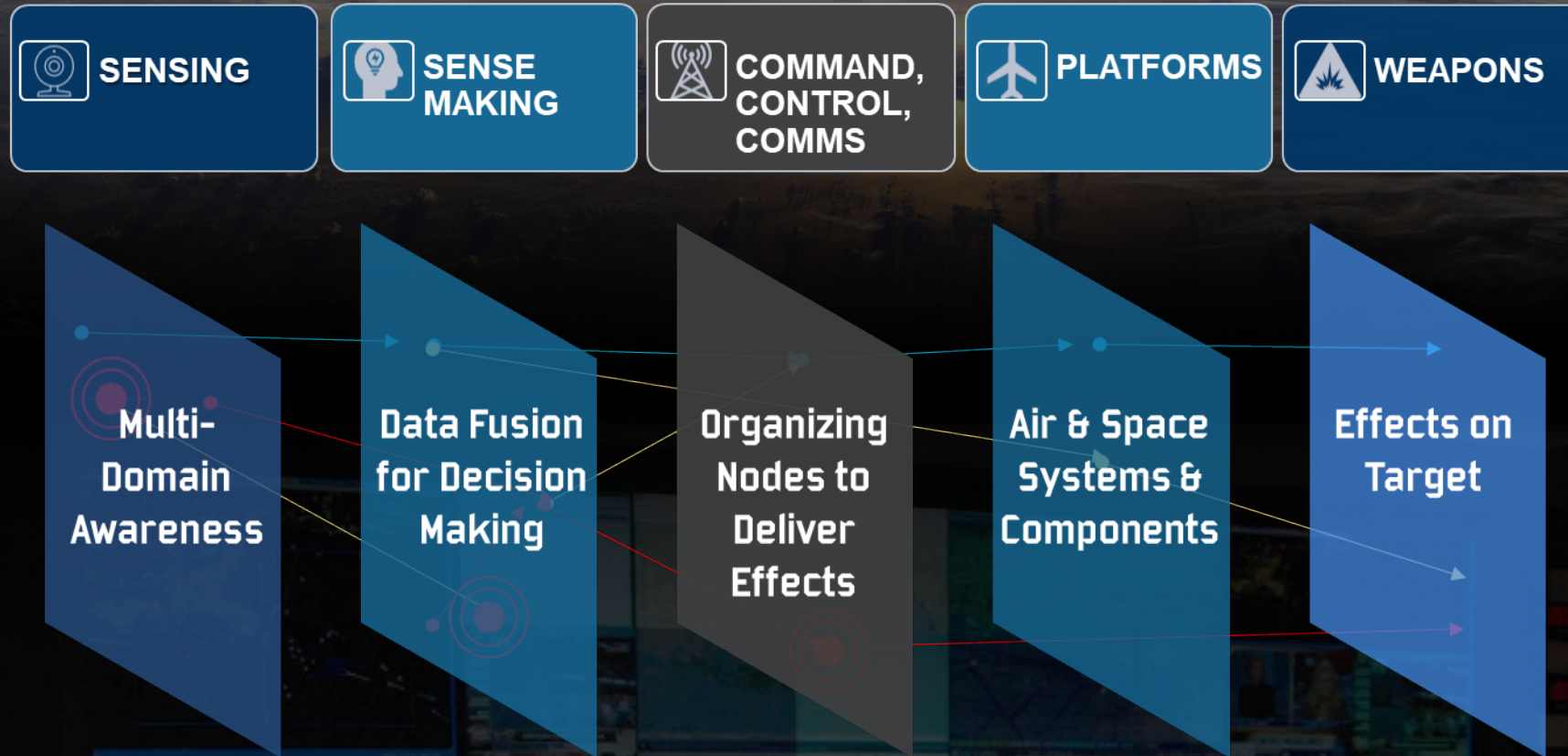
**BATTLESPACE**

**Functional  
Capability  
Areas**

**TECHNOLOGY SPACE**



# Advancing State-of-the-Art with S&T at Every Junction of the Mission







# SKYBORG

Flight Autonomy for  
Uncrewed Air Vehicles

# ROCKET CARGO

Agile Global Logistics





# MISSION CENTRIC INNOVATION MODEL

Industry Partners

- 372 CRADAs



**NORTHROP GRUMMAN**

**UES**



## Technology Ecosystem



Academic Partners

- 1,200+ grants
- 200 Universities
- 500+ STEM Outreach activities in 50 states



Users – pilots / space operators (humans)



- 10,000 Active Contracts
  - ~50% Small Business
  - Worth ~\$4.2B



AFRL R&D

USAF / USSF



# WE ARE IN THIS TOGETHER

Industry, Small Business

Academia, International Allies

Government, Laboratories



Connect, Ideate & Collaborate

S&T Challenges, Events

Grants & Funding

**Air Force & Space Force Tech Connect**



# Defense Advanced Research Projects Agency

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Stefanie Tompkins, Ph.D.  
Director

DOD FY24 S&T Budget Request

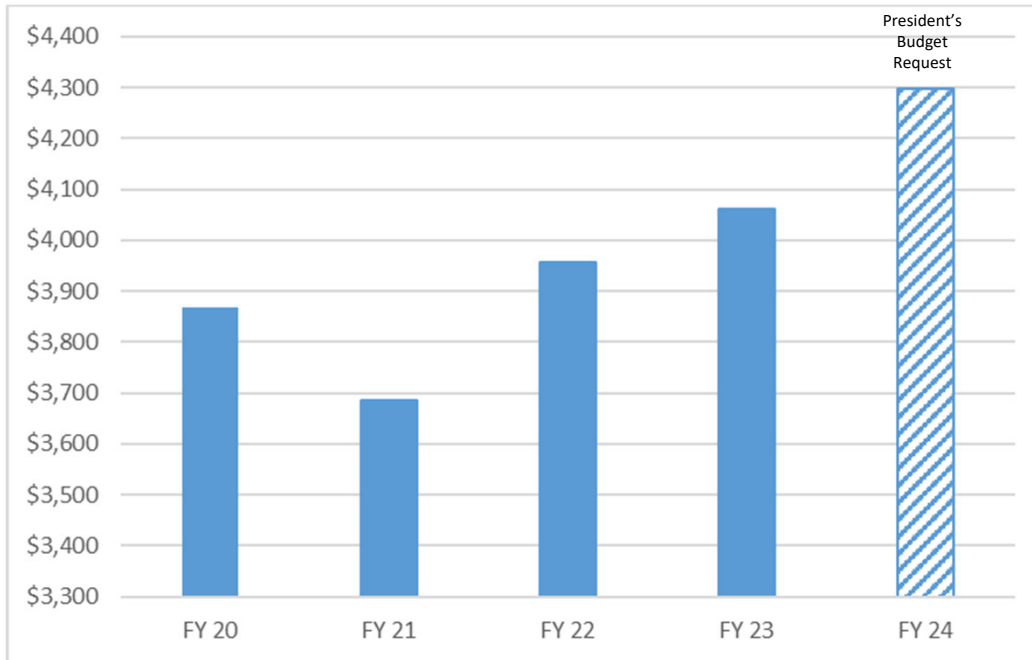
April 14, 2023





# DARPA's Budget

Constant FY23 \$



## Example FY24 Investment Areas

- Microelectronics: \$892M
- Biotech & Warfighter Protection and Performance: \$390M
- Artificial Intelligence: \$322M
- Cyber: \$208M
- Space: \$200M
- Hypersonics: \$131M

**92%**  
of funding to  
projects

**64%**  
to industry

**17%**  
to universities

**24%\***  
of total DoD  
S&T funding



# PREVENT AND IMPOSE TECHNOLOGICAL SURPRISE

## Create New Options for National Security Leaders

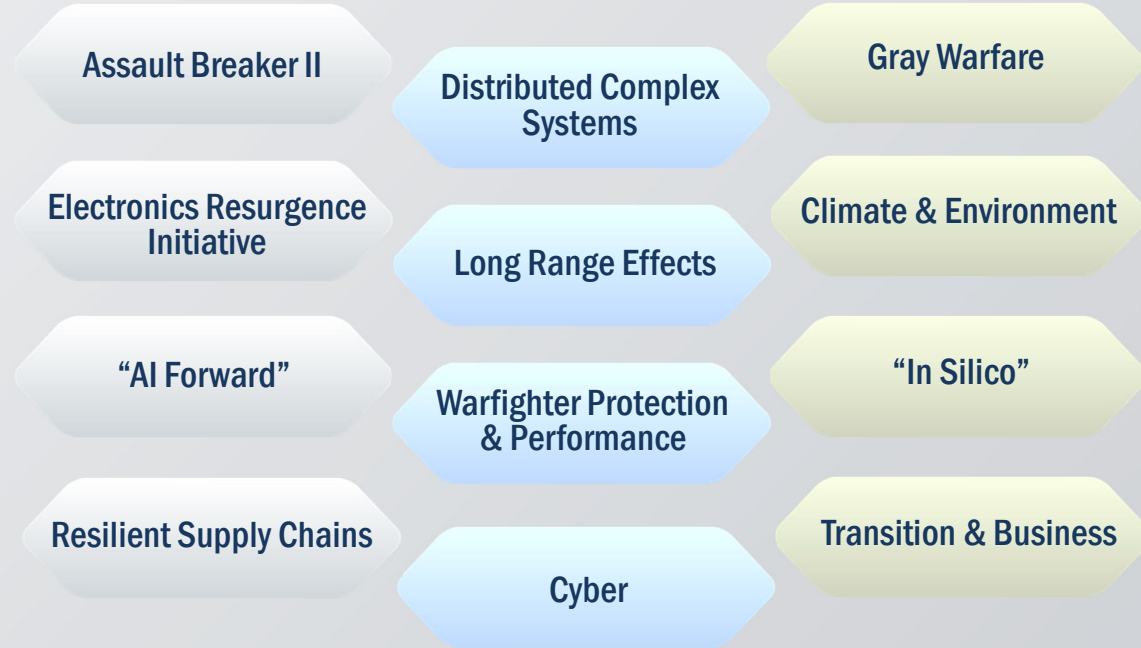


## For All Domains

Space • Air • Land • Sea • Subsurface  
Virtual • Electromagnetic • Social

- YEARS**  
64
- GOV EMPLOYEES**  
215
- FY23 BUDGET**  
\$4.1B
- ACTIVE PROGRAMS**  
250+
- YEARS OF AVG. PM TENURE**  
<5

## Example Portfolios

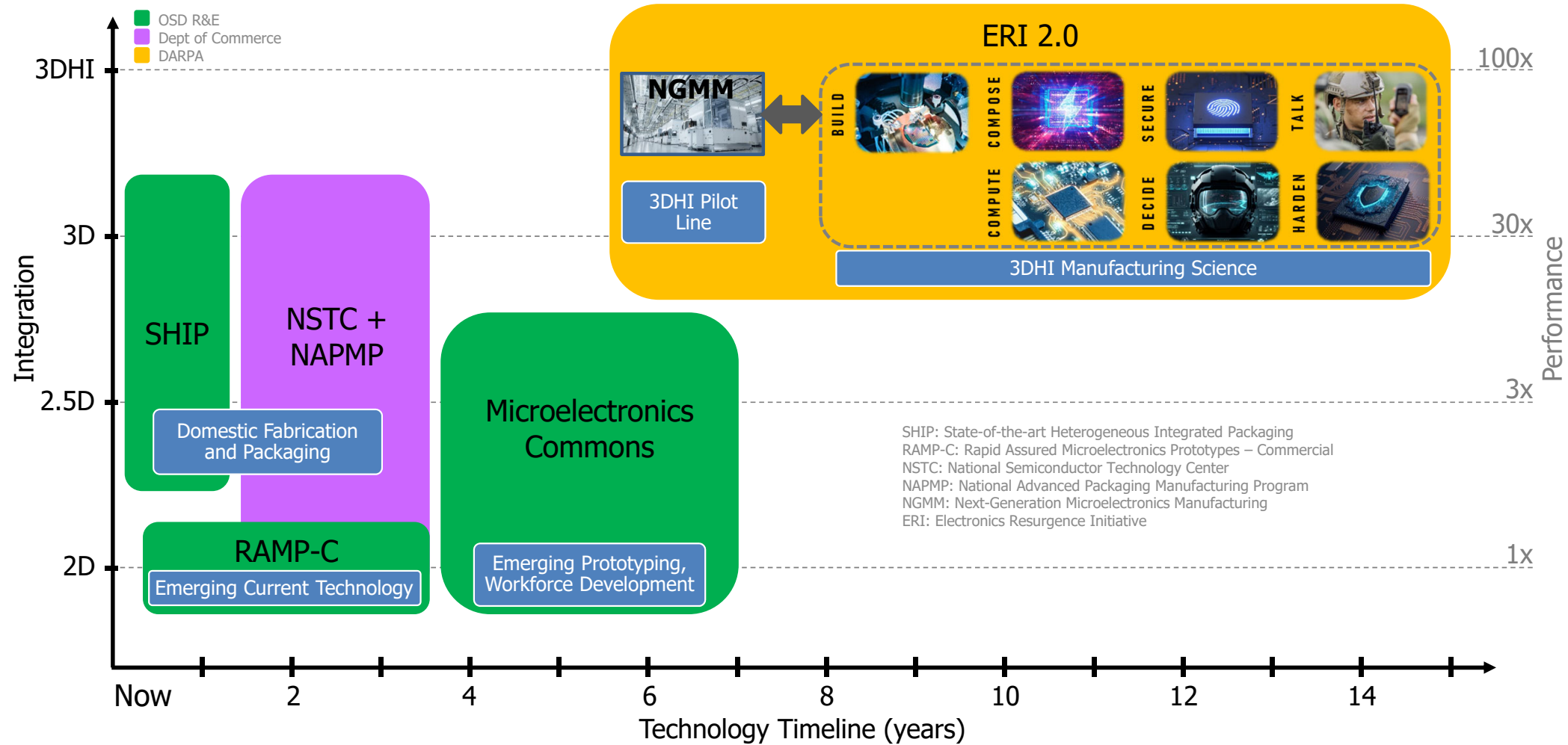


## Foundations for Technological Surprise

Biotechnology • Complexity • Chemistry • Data Science  
Human-Machine Symbiosis • Interoperability • Machine Learning  
Materials • Microelectronics • Quantum • Social Science ...



# ERI 2.0: A long term vision for advanced microelectronics manufacturing



SHIP: State-of-the-art Heterogeneous Integrated Packaging  
 RAMP-C: Rapid Assured Microelectronics Prototypes – Commercial  
 NSTC: National Semiconductor Technology Center  
 NAPMP: National Advanced Packaging Manufacturing Program  
 NGMM: Next-Generation Microelectronics Manufacturing  
 ERI: Electronics Resurgence Initiative



TRUSTWORTHY AI

# FORWARD

THEORY • ENGINEERING • HUMAN CONTEXT





[www.darpa.mil](http://www.darpa.mil)