AUBURN

NAVIGATING THE CHANGING LANDSCAPE OF RESEARCH FUNDING

JONATHAN PETTUS, EXEC. DIRECTOR, APPLIED RESEARCH INSTITUTE
DEREK TOURNEAR, PHD – DIRECTOR OF SPACE INNOVATION

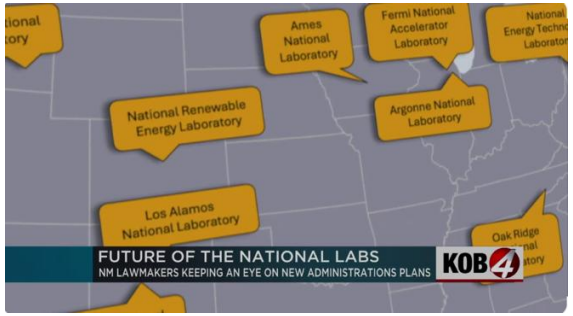
MARKETPLACE: TURBULENCE, TRANSITION, AND TRANSFORMATION

- Turbulent environment with budget uncertainties, non-traditional Defense and NASA leadership, and desire to eliminate layers of complexity and cost
- Broad confluence of challenges for traditional R&D ecosystem (speed, agility, efficiency)
- Proposed 15% cap to university research indirect costs
- Customer priorities: workforce development, rapid technology maturation, non-traditional partners, flexible acquisition, rebuilding industrial base
- Significant interest in partnering with Auburn within key customer sets and companies

Johns Hopkins $800 Million Cuts Will Be 'Devastating' For Maryland and Beyond - WSJ

More Than 150,000 Federal Workers Accepted Trump's Resignation Incentives

How Pentagon plans to layoff nearly 60,000 civilian workforce without affecting military readiness?



Judge overturns NSF's 15% cap on indirect costs of research

POLITICS | NATIONAL SECURITY

Military-Tech Startups Vie for Billions as Hegseth Shakes Up Pentagon Spending

Venture-backed companies see opening to take business from traditional defense contractors

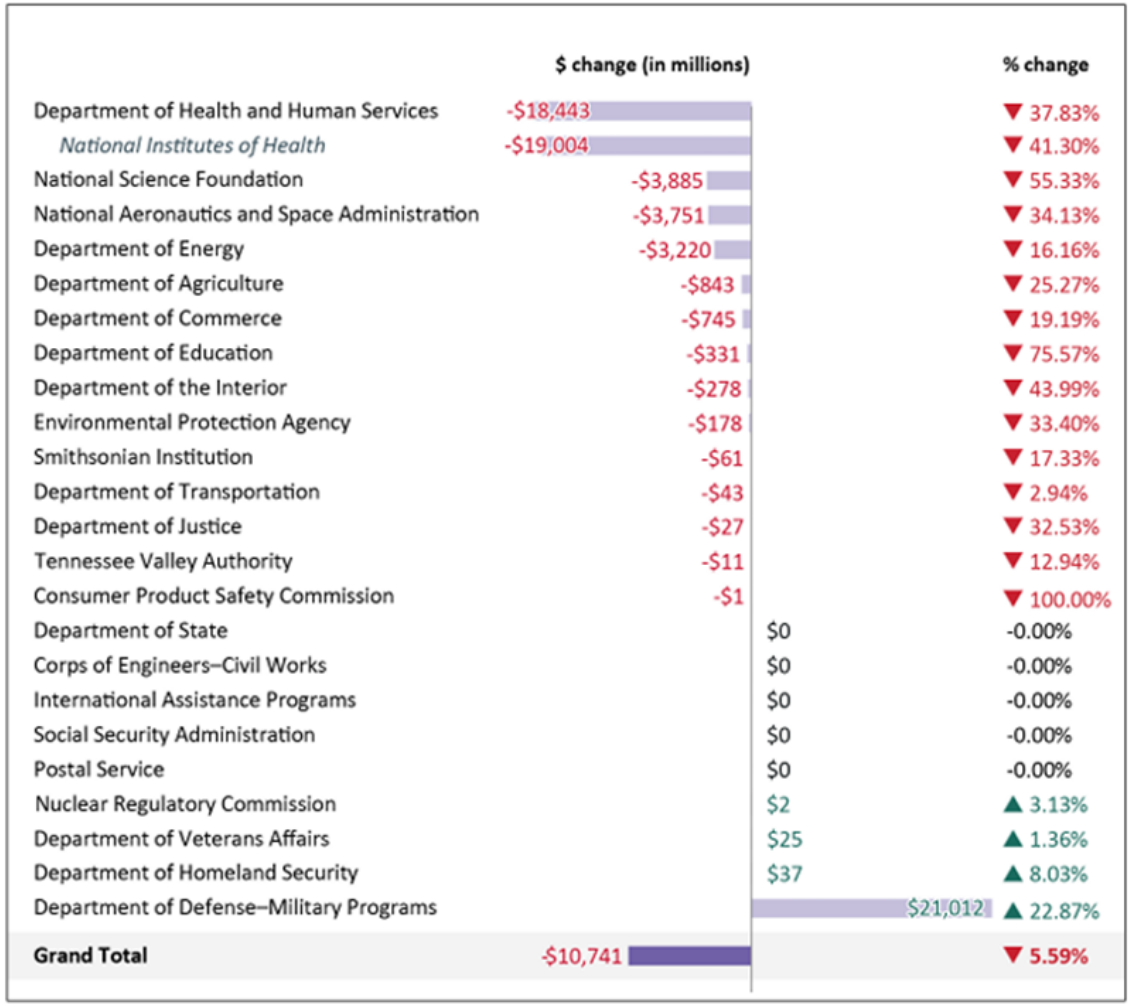
By Drew FitzGerald Follow, Heather Somerville Follow and Nancy A. Youssef Follow
Feb. 28, 2025 at 5:00 am ET

Largest DOD R&D budget in history: The proposed $179 billion budget for research, development, test, and evaluation (RDT&E) is the largest in Pentagon history, reflecting an emphasis on technology to shape future warfare.

FY26 FEDERAL R&D FUNDING OMB REQUEST

Figure 2. Crosscut Budget Amounts for Federal Research and Development (R&D) Funding, President's FY2026 Request Compared to FY2025 Levels

(budget authority, in current dollars)



	$ change (in millions)	% change
Department of Health and Human Services	-$18,443	▼ 37.83%
National Institutes of Health	-$19,004	▼ 41.30%
National Science Foundation	-$3,885	▼ 55.33%
National Aeronautics and Space Administration	-$3,751	▼ 34.13%
Department of Energy	-$3,220	▼ 16.16%
Department of Agriculture	-$843	▼ 25.27%
Department of Commerce	-$745	▼ 19.19%
Department of Education	-$331	▼ 75.57%
Department of the Interior	-$278	▼ 43.99%
Environmental Protection Agency	-$178	▼ 33.40%
Smithsonian Institution	-$61	▼ 17.33%
Department of Transportation	-$43	▼ 2.94%
Department of Justice	-$27	▼ 32.53%
Tennessee Valley Authority	-$11	▼ 12.94%
Consumer Product Safety Commission	-$1	▼ 100.00%
Department of State	$0	-0.00%
Corps of Engineers–Civil Works	$0	-0.00%
International Assistance Programs	$0	-0.00%
Social Security Administration	$0	-0.00%
Postal Service	$0	-0.00%
Nuclear Regulatory Commission	$2	▲ 3.13%
Department of Veterans Affairs	$25	▲ 1.36%
Department of Homeland Security	$37	▲ 8.03%
Department of Defense–Military Programs	$21,012	▲ 22.87%
Grand Total	-$10,741	▼ **5.59%**

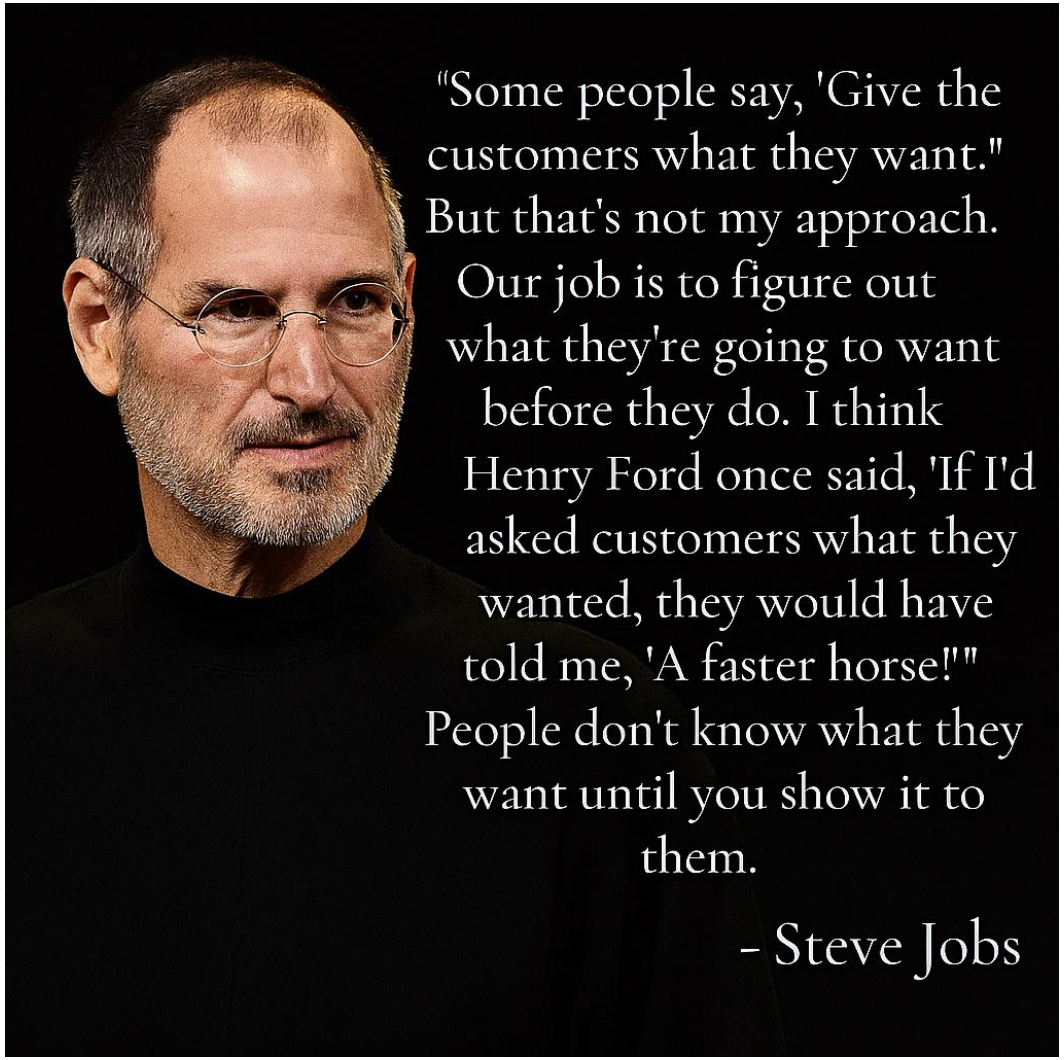
Source: CRS calculated R&D funding totals using information provided by the Office of Management and Budget (OMB); OMB, email communication with author, July 2, 2025.

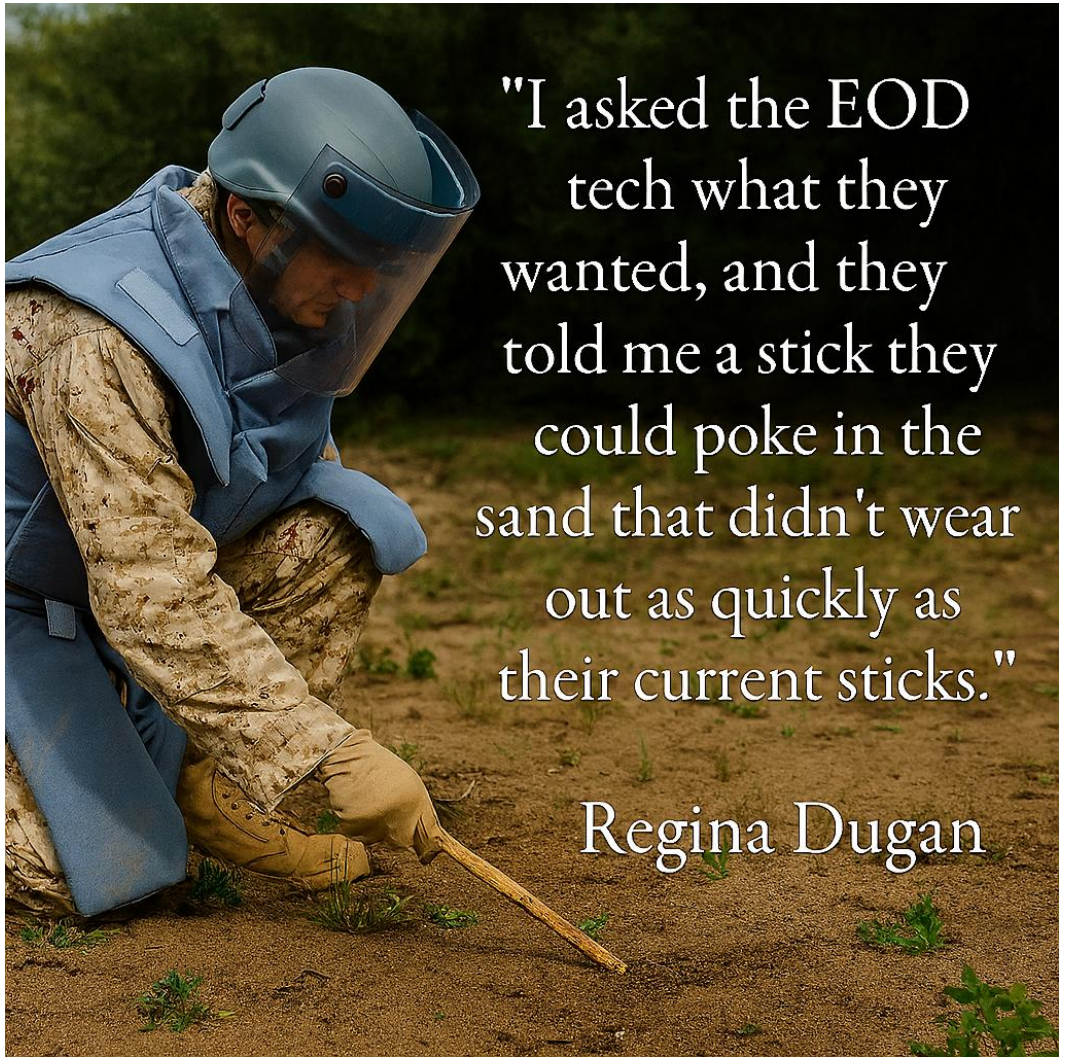
FISCAL YEAR (FY) 2027 ADMINISTRATION RESEARCH AND DEVELOPMENT BUDGET PRIORITIES

Priority	Focus Areas	Strategic Outcomes
1. Critical & Emerging Technologies	AI, Quantum, Semiconductors, Advanced Comms (5G/6G), Future Computing, Advanced Manufacturing	Maintain U.S. dominance; accelerate innovation; secure supply chains
2. Energy Dominance & Frontiers	Nuclear fission/fusion, Fossil & renewable energy, Critical minerals, Polar research, Ocean exploration	Secure reliable energy; expand vitality; strengthen national security
3. American Security	Hypersonics, Autonomous systems, Resilient space, Nuclear deterrence, AI-enabled ISR, Cybersecurity, Golden Dome	Robust defense; protect homeland; mitigate threats
4. Health & Biotechnology	Chronic & rare diseases, Agriculture resilience, Biosafety & biosecurity, Domestic biomanufacturing	Improve health; strengthen biosecurity; scalable biomanufacturing
5. Space Dominance	Human exploration (Moon/Mars), Long-duration habitation, In-space assembly, Space nuclear power, Advanced propulsion	U.S. leadership in space; transformative exploration & security

(OMB Memo M-25-34, 9-23-25)

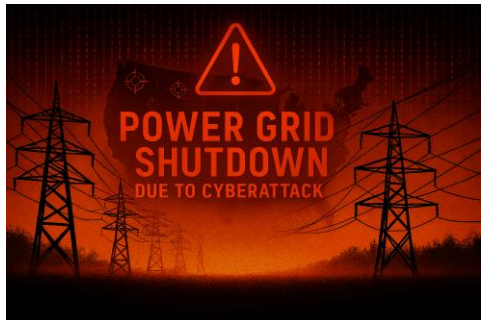
WHY YOU DON'T ASK CUSTOMER WHAT THEY WANT

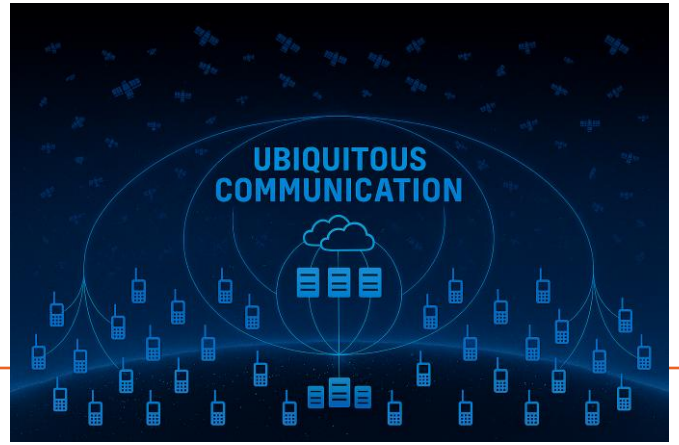




WHAT ARE THE BIG PROBLEMS IN NATIONAL DEFENSE

- **Military Readiness – manpower shortages…**
  - Autonomy (AI)
  - Effectiveness
  - Distributed logistics (energy, etc…)
- **Asymmetric threats –**
  - Proliferation
  - Affordability
  - New paradigms
  - *Offensive and Defense against maneuvering missiles*
- **Cybersecurity – Offense & Defense**
- **Biological advances**
  - Modeling to understand interactions (AI)
  - Defenses against hazards
  - Combat Care
- **Distributed warfare**
  - Secure high bandwidth comm
  - Edge processing
  - AI
- **Never enough intelligence –**
  - Sensors
  - Analytics (AI/ML)





WHAT IS INNOVATION? - DISRUPTION!

- ~1900 Ice was harvested and distributed
- *Innovation* was bigger horses/sharper saws…
- leader – **Knickerbocker Ice Co**.

- ~1920 Artificial ice made in “ice houses” supplant harvesting
- *Innovation* was higher ice production….
- leader - **American Ice Company**

- ~1940 at home refrigeration supplanted ice houses
- *Innovation* was/is more features….
- leader – **General Electric**

Innovation occurs when you get to the next curve. Not trying to do things 10% better — Guy Kawasaki

DISRUPTIVE EXAMPLES IN US AIR FORCE

DARPA et al. Develop ~1981 - 1995

Deployment Balkan war 1995

Others (not Air Force) weaponized Predator ~1999

Air Force makes Predator an official program ~2002

U.S. AIR FORCE

Space Development Agency established outside of Air Force (Space Force) 2019

SDA

SPACE DEVELOPMENT AGENCY

SDA flies first demos 2021

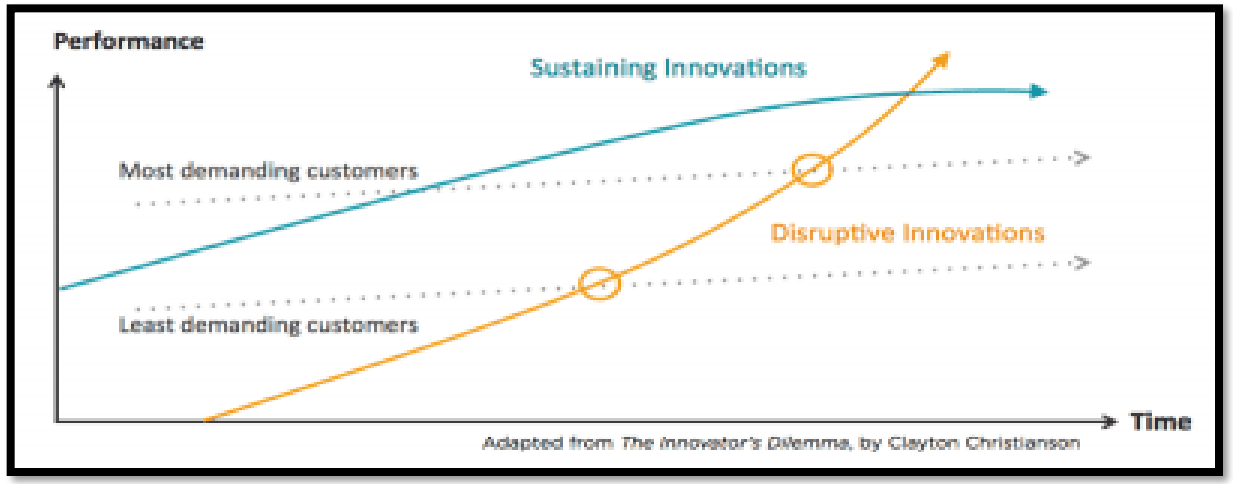
Tranche 0 launches ~2023

SDA integrated into Space Force ~2023

UNITED STATES
SPACE FORCE

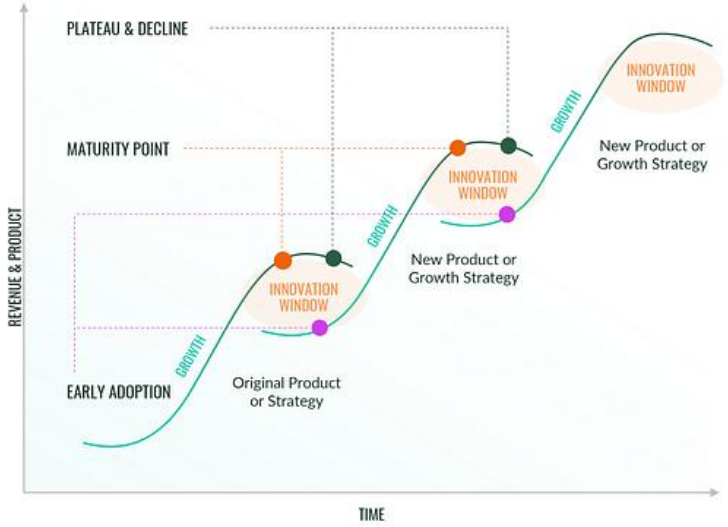
Tranche 1 launches 2025

INNOVATOR'S DILEMMA – WHAT IS IT?



"With few exceptions, the only instances in which mainstream firms have successfully established a timely position in a disruptive technology were those in which the firms' managers set up an autonomous organization charged with building a new and independent business around the disruptive technology."

- Clayton Christensen



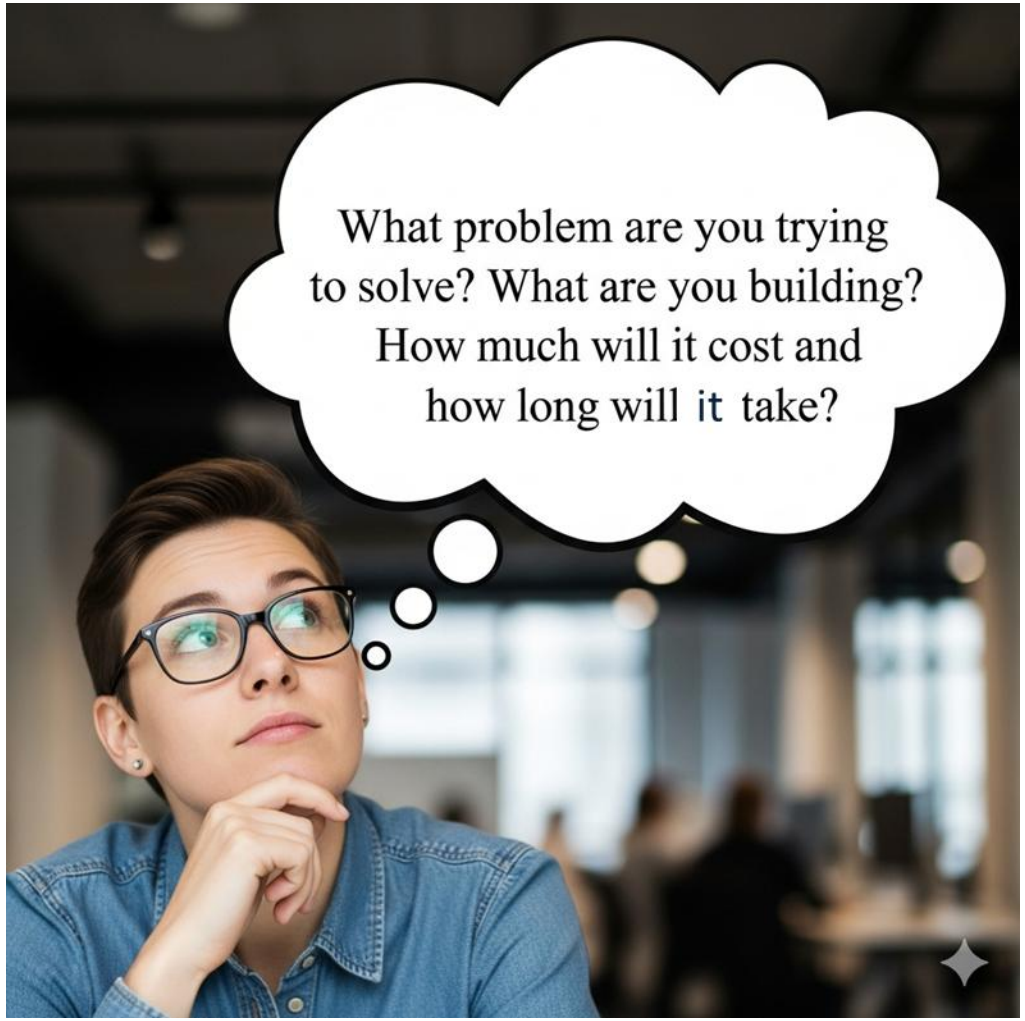
WORKING WITH ARPAs AND DOD LABS (PRIMARILY AFRL & MDA)

DARPA

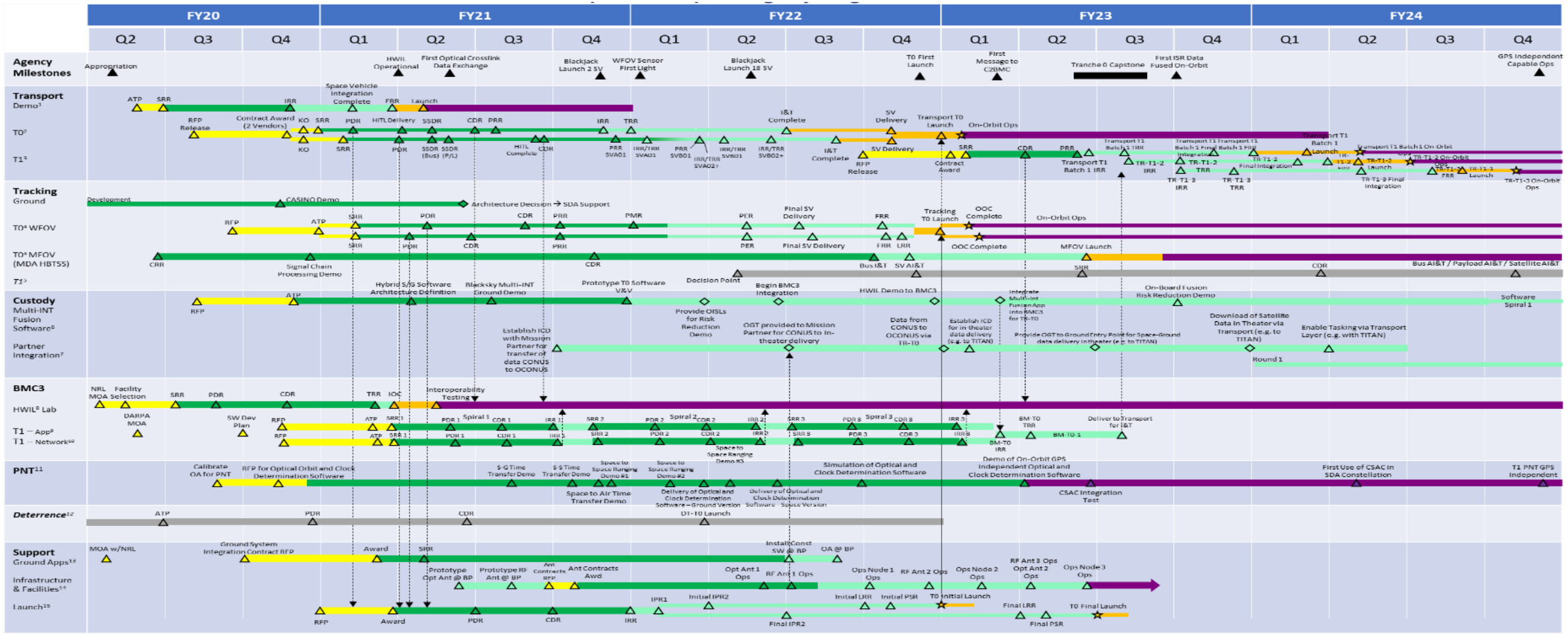
- The Defense Advanced Research Projects Agency (DARPA) is an agency of the US Department of Defense responsible for the development of new technologies for use by the military.
- Established in 1958, after the Soviet launch of the Sputnik.
- DARPA's mission is to prevent technological surprise.
- Their projects rarely succeed, but when they do, they revolutionize the industry (early Internet, research in artificial intelligence, integrated circuits etc.)

- **DARPA –** easiest to work with, and the model for the others – broad DOD interest (so *everything*)
- **IARPA**- Intelligence Community focused – but friendly to universities. Smaller budget, and more difficult to work with.
- **ARPA-E -** very small budget, and focused on energy.
- **DIU –** Easy to work with, but really should have a commercial partner.
- **AFRL –** More traditional, but if you find a scientist at the lab to partner with, this is a good option
- **MDA –** Large budget, focused on every aspect for missile defense (hint – EVERYTHING can be spun to support missile defense… well almost….)

INNOVATION REQUIRES A PROGRAM MANAGER MINDSET



Integrated Schedule – You do need to actually make a plan



AI&T: Assembly, Integration & Test
ATP: Authorization to Proceed
CDR: Critical Design Review
CRR: Component Requirements Review
CSAC: Chip-Scale Atomic Clock
FPA: Focal Plane Array
FRR: Flight Readiness Review
HWIL: Hardware-in-the-Loop
IPR: Interim Progress Review
IRR: Integration Readiness Review
KO: Kickoff
LRR: Launch Readiness Review
MOR: Mission Operations Review
OGT: Optical Ground Terminal
OISL: Optical Intersatellite Link
OOC: On-Orbit Checkout
ORR: Operational Readiness Review
PDR: Preliminary Design Review
PER: Pre-Environmental Review
PMR: Program Midpoint Review
PRR: Production Readiness Review
PSR: Pre-Shipment Review
RFP: Request for Proposal
SRR: System Requirements Review
SSDR: Sub-System Design Reviews
TRR: Test Readiness Review
V&V: Validation and Verification

HOW TO ENGAGE WITH DARPA (AND SPINOFFS)

1. Identify the Office within DARPA that would be interested in your idea
   - **Bio Tech Office** – self explanatory…
   - **Defense Science Office** – the DARPA within DARPA
     - Materials, etc; New sensors; Math & new computers; AI enabled analytics
     - Catch all for any immature research
   - **Information Innovation Office** – catch all for cyber
     - Offensive/defensive / transformative AI, any novel processing / transport
   - **Microsystems Tech Office** –
     - Next gen compute (quantum, photonic, organic)
     - Novel manufacturing
   - **Strategic Tech Office** – Systems
     - Sensing; effects; command/control/comm
     - New warfare paradigms for autonomous proliferated systems
     - Critical infrastructure protection (no kidding they include lunar in this)
   - **Tactical Tech Office** – demo a new operational system at smallest relevant scale (e.g. 2 satellites to demo a constellation)

2. **Talk to a Program Manager** (PM) – email/call/face to face – *continually*

3. Submit ideas to an Office Wide BAA solicitation

4. Respond to a Program solicitation

www.DARPA.mil

YOUR DISRUPTION BECOMES MAINSTREAM

THEN

"... **a pet project** for both acting SecDef... and Under SecDef ...."
- USAF Secretary H. Wilson's memo, 28 Feb 19

"...Launching hundreds of cheap satellites into theater **...will result in failure on America's worst day** if relied upon alone"
– Defense News, 09 Apr 19

". ... there's **no need for yet another entity** to buy space stuff. The United States Air Force is doing pretty well at that."
– Aspen Security Forum, 19 Jul 19

"I have some **concerns about what is the mission of this entity**. Why do we think it would be better ...? And what exactly would it be focused on conceptually? ...why would we want something that is completely separate from DARPA for months or years to then roll in."
– Inside Defense, 28 Feb 19

"SDA will be ... an **integral part of the Space Force's** force design, brings resiliency, accelerated capability delivery ..."
- *USAF Public Affairs, 1 Oct 22*

"**I fully support their strategy**, and we will maintain their structure and culture to let them continue to ...do what they do best."
- *Space News, 1 Oct 22*

"I am **genuinely excited about their approach** to doing business... doing things on two-year [cycles], and they are delivering capabilities faster. And I actually think that's a model that ... we can learn from."
- *Breaking Defense, 20 Sep 22*

"**Building smaller spacecraft can be done faster**. ... So, going ...smaller, in more manageable bite-sized chunks of ground, are **key enablers to speed**.
- *Breaking Defense, 20 Sep 22*

NOW

VISION + PLAN + EXECUTION = SUCCESS!

- A vision needs a plan! First step is to understand implications of new technology developments
  - It was the development of the small electric motor that enabled household refrigeration….

- Start with what **you're** researching
  - Engineering
    - If your material, invention, sensor, whatever is *wildly* successful, what could that mean for one of the big DOD challenges?
    - We can help figure out how to apply your breakthrough.
  - Manufacturing technology
    - How can your process/technology enable completely new manufacturing?
    - Examples:
      - How can space technology be manufactured and tested in a more automated, rapid, proliferated manner?
      - How can space be used as a location for factories of the future?
  - Medicine/bio/pharma
    - Do you have a breakthrough in modeling, combat care, or bio defense or bio engineering?
    - Example - How can biology enable creation of space structures? (Current DARPA program)
  - There are *Very few* technology breakthroughs that don't have a National Security impact. We can help.

CONTRACT VEHICLES TO PURSUE R&D OPPORTUNITIES

Vehicle	Best Fit / Eligible Entities	Strengths	Limitations	Typical Use Cases
Other Transaction Authority (OTA)	Nontraditional defense contractors, small businesses, universities via teaming	High flexibility, faster awards, fewer constraints, encourages innovation	Requires special authority, may need cost-sharing, oversight complexity	Prototyping, bridging 'valley of death', transition to production
SBIR / STTR	Small businesses (SBIR); Small business + university (STTR)	Encourages innovation, protects IP, phased program, sole-source Phase III	Award size caps, highly competitive, Phase III unfunded by program	Proof of concept, early R&D, transition to acquisition
IDIQ / MAC / GWAC	Traditional & nontraditional contractors awarded onto vehicle	Flexibility, shorter lead times, wide applicability	Must be pre-awarded, competition for task orders	R&D, prototyping, sustainment, services
BAA / CSO	Universities, research institutions, industry	Open solicitations, flexible, encourages novel ideas	Competitive, may require cost-sharing, not for narrow procurement	Basic & applied research, exploratory development
CRADA / Cooperative Agreements	Universities, federal labs, industry partners	Lab access, knowledge transfer, low barrier	No direct funding, limited labs, IP negotiation complexity	Joint lab-based research, pilot demonstrations

AUARI POINTS OF CONTACT

Role	Contact
Army & Air Force Programs **DEVCOM** **Maneuver Center of Excellence** **Aviation Center of Excellence** **Space and Missile Defense Command** **Special Operations Command**	Dr. Brock Birdsong brock.birdsong@auburn.edu
Space & Missile Defense Programs **Missile Defense Agency** **Space Development Agency** **Space Force** **NASA** **US Space Command** **Rad Hard Program**	Melanie Baker melanie.baker@auburn.edu
Advanced Manufacturing **Additive Metal** **Additive Polymer** **Composite** **Large Format Printing**	Dr. Luke Boyer lukeboyer@auburn.edu
Systems Engineering and Integration **Digital Engineering** **Modeling and Simulation**	Scott Thomas scott.thomas@auburn.edu
Uncrewed Systems **Air, Water, Land**	Justin Harrison Justin.harrison@auburn.edu
On Campus Faculty Liasson	Tim Keeter tim.keeter@auburn.edu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Biggin Hall