

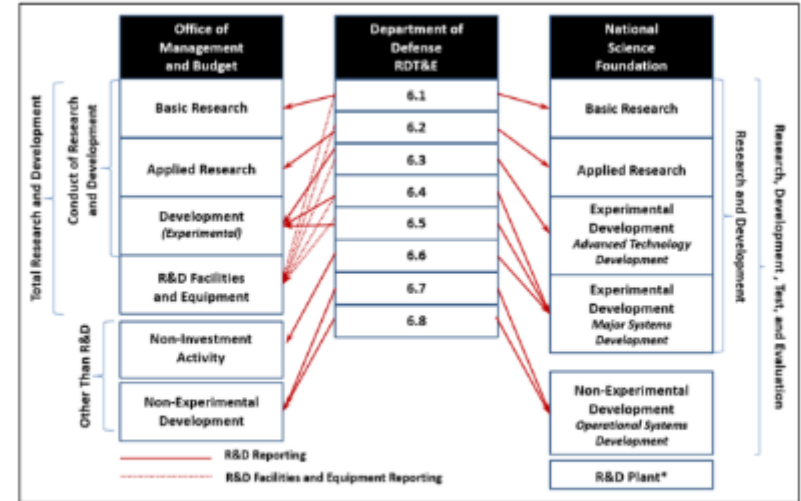
Opportunities Deep Dive

Purpose:

1. Identify potential opportunities that are tied to today's topics and have merit to facilitate collaboration and partnership discussions and enable team building for larger proposals.
2. Identify future deep dive discussion topics, training topics, or other needs that will help you win proposals.

1. Funding for Research & Development (R&D)
 1. State of Ohio Initiatives
 2. Congressional Actions
 3. Department and Agency Justification Books
2. Funding
 1. Resources
 2. SBIR/STTR
 3. BAA
 4. Specific Open Solicitations
3. Who Can Help
4. Collaboration and Partnership Booths

Figure 2. DOD RDT&E Crosswalks to OMB, NSF Taxonomies



Sources: CRS telephone and email communications with OMB and NSF, most recently October 1, 2020.

Notes: For FY2017 and subsequent years, OMB notes that budget activity 6.6, RDT&E Management Support, is reported to OMB as 'Non-Investment Activities' under the RDT&E title and is currently not included in federal calculations of R&D funding. OMB (in conjunction with DOD) will continue to evaluate the current approach of

Please feel free to ask questions throughout!

State of Ohio Initiatives

StarLab:

- Free-flying, commercially based, human occupied space stations in Low-Earth Orbit.
- Ohio State University is leading an effort to:
 - ✓ Develop and coordinate all University research aboard StarLab
 - ✓ Host and operate the ground-based 'control lab' for agricultural research aboard StarLab
 - ✓ Serve as a research gateway and catalyst for other potential users, including the US National Security Space enterprise, sovereign space programs, and global private-sector industry.

National Advanced National Air Mobility Center of Excellence (NAAMCE) @ Springfield-Beckley Airport:

- Supports Agility Prime, a non-traditional research and development program centered on Unmanned Aerial Systems (UAS) managed by AFRL at WPAFB to advance AAM efforts, build confidence in the technology, attract investors, and provide the Air Force revolutionary agility for numerous missions.
- Home of SkyVision, a State of Ohio-AFRL partnered system to field and operate a Ground-Based Detect and Avoid (GBDAA) system at the site. In 2019, the Federal Aviation Administration granted AFRL authority for beyond-visual-line-of-sight flight of UAS at the airport.

Economic Development Agency - Build Back Better Program:

- Build Back Better Regional Challenge: Assists communities in their efforts to build back better by accelerating the economic recovery from the coronavirus pandemic and building local economies that will be resilient to future economic shock. ***Northeast Ohio one of the national down selected teams***
- Good Jobs Challenge: Get Americans back to work by building and strengthening regional systems and sectoral partnerships to train workers with in-demand skill that lead to good paying jobs

Department of Energy Clean H2 Hubs:

- Congressionally directed at least four "regional clean hydrogen hubs" that would produce hydrogen for uses such as heating, manufacturing and transportation.

Congressional Opportunity

U.S. Senate - U.S. Innovation and Competition Act (USICA)

U.S. House - America Creating Opportunities for Manufacturing, Pre-Eminence in Technology, and Economic Strength (COMPETES) Act of 2022

- CHIPS Act
 - \$52.7B to support U.S. semiconductor industry, including research & development
- The Endless Frontier
 - ✓ \$81B investment in NSF
 - ✓ Focus on ten key technologies — precision agriculture, advanced materials, AI, machine learning, quantum, and advanced manufacturing, disaster prevention and mitigation, etc.
 - ✓ Funding for Test Beds, University Innovation Center, Regional Technology HUBS, Innovation Institutes
 - ✓ Also funding for R&T grants, student and university capacity building, space awareness, advanced energy, etc
 - ✓ Major expansion of EPSCOR — support of minority institutions
 - ✓ Strong investments in STEM — K-12
 - ✓ Represents the 2022 version of the original Science the Endless Frontier (1945)
- Department of Commerce directed to designate regional technology hubs across the country and authorizes \$10 billion over five years for these hubs.

Congressional Justification “R” Books

Justification Books

- Federal department or agency interests in future years (often before a solicitation is released)
- Unknown connections & opportunities (attributable UAS digital engineering funds in a Structures line)
- Potential funding (Congress still gets to decide)
- What research level (“Budget Activity” 2 is Applied Research or 6.2)

UNCLASSIFIED												
Exhibit R-2A, RDT&E Project Justification: PB 2022 Air Force										Date: May 2021		
Appropriation/Budget Activity 3600 / 2					R-1 Program Element (Number/Name) PE 0602201F / Aerospace Vehicle Technologies				Project (Number/Name) 622401 / Structures			
COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
622401: Structures	-	37.043	82.400	51.546	0.000	51.546	-	-	-	-	-	-
A. Mission Description and Budget Item Justification												
This project develops advanced structures concepts to exploit new materials and fabrication processes and investigates new concepts and design techniques. New structural concepts include low cost design and fabrication techniques, incorporating subsystem hardware items and adaptive mechanisms into the aerospace structures and/or skin of the platform.												
B. Accomplishments/Planned Programs (\$ in Millions)										FY 2020	FY 2021	FY 2022
Title: Aircraft Service Life Technologies										13.384	29.771	18.615
Description: Develop an economic service life analysis capability comprised of analysis tools, methodologies, and structural health monitoring technologies.												
FY 2021 Plans: Complete demonstration of Aircraft Digital Twin models and tools on legacy fleet aircraft. Continue lifing methods for durability and damage tolerance of aging composite structures on legacy fleet aircraft. Complete development of digital maintenance models and virtual and augment reality maintenance tools.												
FY 2022 Plans: Continue lifing methods for durability and damage tolerance of aging structures on legacy fleet aircraft. Initiate digital engineering systems analysis on a low cost attributable unmanned aircraft system.												
FY 2021 to FY 2022 Increase/Decrease Statement: FY 2022 decreased compared to FY 2021 by \$11.156 million. Funding decrease due to reduced emphasis on aircraft service life technologies.												
Title: Vehicle Design Technologies										12.170	27.072	16.937
Description: Develop methodologies to reduce the cost and time involved from design to full-scale testing of structural concepts and aerospace systems.												
FY 2021 Plans: Continue the development of advanced high fidelity aircraft design analysis tools. Continue the development of integrating cost, mission effectiveness, and affordable manufacturing methods into aircraft design analysis tools. Complete the development of control effector designs for supersonic tailless aircraft. Continue new design techniques to quantify and trade risk impacts against												
PE 0602201F: Aerospace Vehicle Technologies Air Force					UNCLASSIFIED Page 4 of 20			R-1 Line #6		Volume 1 - 50		

Funding - Resources

Student & Faculty funding list and links are in the back-up slides of this deck

Links to organizational specific opportunities are at slide 26

For free online training on useful tools like the below, please visit the Parallax Learning Hub.

Level One: Getting to Phase I		
Introductory (Overview/Scene-Setter) Module		
SBIR/STTR Intro Modules	Proposal Tips and General Info Modules	
<ol style="list-style-type: none"> 1. Program History 2. Eligibility 3. SBIR vs. STTR (Similarities & Differences) 4. Participating Agencies 5. Web Site Navigation 6. Registration 7. DoD SBIR/STTR 8. USAF Organization 9. Program Structure 10. Getting to Phase I 	<ol style="list-style-type: none"> 1. General Writing Tips 2. Writing a White Paper 3. Writing a 5-page Proposal 4. Writing a Technical Proposal 5. Quad Charts 6. The Heilmeyer Catechism 7. Proposal Budgets 	<ol style="list-style-type: none"> 8. Commercialization 9. Common University Agreements 10. University Tech Transfer Offices 11. SBIR/STTR Data Rights 12. Intellectual Property 13. Spin-off Entities 14. Venture Capital
Capstone Knowledge Check (must score 90% to receive Level One Certification)		
Level Two: Phase I thru Phase II		
Introductory (Overview/Scene-Setter) Module		
SBIR/STTR Phase I thru II Modules	General Related Business Modules	
<ol style="list-style-type: none"> 1. Getting Started 2. So Now I Have a Contract 3. Contracts vs. Grants 4. Reporting 5. AF Roles & Responsibilities 6. Phase II Strategy & Proposal 7. Traditional vs. Open 8. Customer Discovery 9. Connecting in the AF 10. Pitch Days 11. Transitioning from Phase I to Phase II 	<ol style="list-style-type: none"> 12. Phase II & II+ Options 13. Funding from Other Sources 14. The MOU 15. Intellectual Property and How to Pitch without Compromising Your IP 16. Partnership Formation 17. External Support Programs Overview 18. Preview of Coming Attractions in Phase III & Beyond 	<ol style="list-style-type: none"> 1. Pitching 101 2. Creating Your Story 3. High-level Intro for Level 2 4. Slide Prep Tips 5. Pitching Tips 6. Investor vs. Technical Presentations 7. Partnering Opportunities w/Primes I 8. Working with Univ. Tech Transfer II 9. Export Control/ITAR 10. Cyber 11. Finance, Budget, & Accounting Considerations
Knowledge & Application Activities in Each Module (must pass to receive Level Two Certification)		
Level Three: Phase III & Beyond		
SBIR/STTR Phase III Modules	General Related Business Modules	
<ol style="list-style-type: none"> 1. Getting Started: Transitioning to Phase III 2. Department of Defense Structure 3. Department of Air Force Structure 4. SBIR/STTR Sole Source Benefits 5. Inter-Agency SBIR/STTR Strategy 6. Contracting Opportunities & SBIR/STTR Treatment 7. Contracting Considerations for Phase III (including Defense Acquisition, FAR, DFARS), and the Art & Science of Commercialization 8. Dealing with Sensitive & Classified Technologies 	<ol style="list-style-type: none"> 1. Strategic Financing 2. Government Accounting & Auditing 3. IP, IP Strategy, & Data Rights 4. Taking on Equity Investment 5. Pitching to Your Audiences 6. Partnering Opportunities w/Primes II 7. Making Your Product Available 8. Heilmeyer Catechism Revisited 9. Mission Model Canvas/Lead Business Capstone Module 	
Knowledge & Application Activities in Each Module (must pass to receive Level Three and Entire Curriculum Certification)		

Level One: Getting to Phase I
~24 videos each 3 to 7 min.
Complexity: Introductory
Launched: January 2021

Level Two: Phase I thru Phase II
Videos and other learning modalities
Complexity: Intermediate
Targeted Roll-out: March 2022

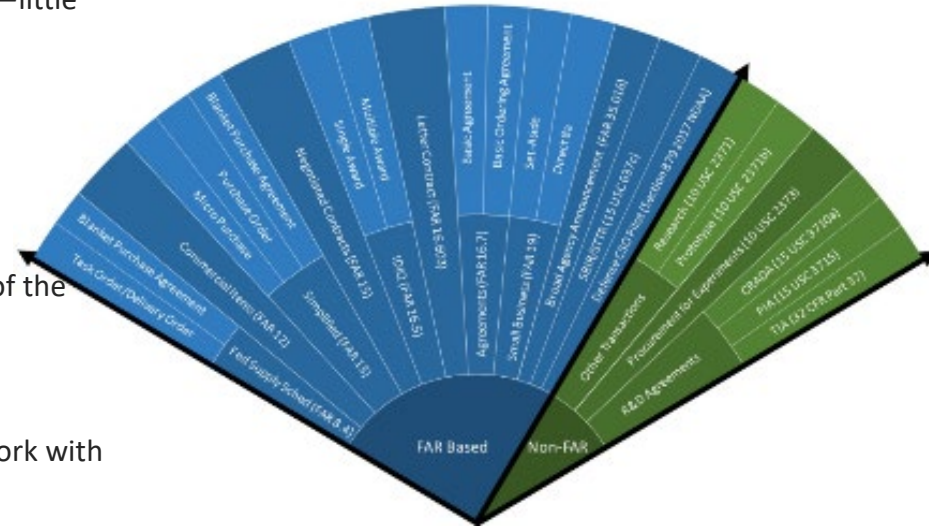
Level Three: Phase III & Beyond
Videos and multi-faceted learning modalities
Complexity: Advanced
Targeted Roll-out: Summer 2022

U.S. Gov't Business Arrangements

- **Assistance:**
 - **Grant:** Used to acquire basic research (6.1), transfer thing of value to recipient to carry out public purpose of support or stimulation—little government involvement
 - **Cooperative Agreement:** Same as a grant, but with substantial government involvement
 - **Technology Investment Agreement (TIA):** Increase commercial involvement in defense research programs

- **Contracts:** acquire property or services for the direct benefit or use of the Federal Government.

- **Agreements:**
 - **Partnership Intermediary Agreements:** Gov't<->Nonprofit to work with small business/academia to identify joint activities
 - **Other Transactions:** Flexible agreements not subject to federal acquisition regulations



Links

- <https://aaf.dau.edu/aaf/contracting-cone/>

Funding - SBIR/STTR

○ **Assistance:**

- **Grant:** Used to acquire basic research (6.1), transfer thing of value to recipient to carry out public purpose of support or stimulation—little government involvement
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SBIR/STTR:
An annually directed funded program that enables small businesses to explore their technological potential and provide the incentive to profit from its commercialization, including tech transfer from universities to industry.

SBIR ~ \$3.2B/yr | STTR ~ \$450M/yr
~5,000 awards/yr



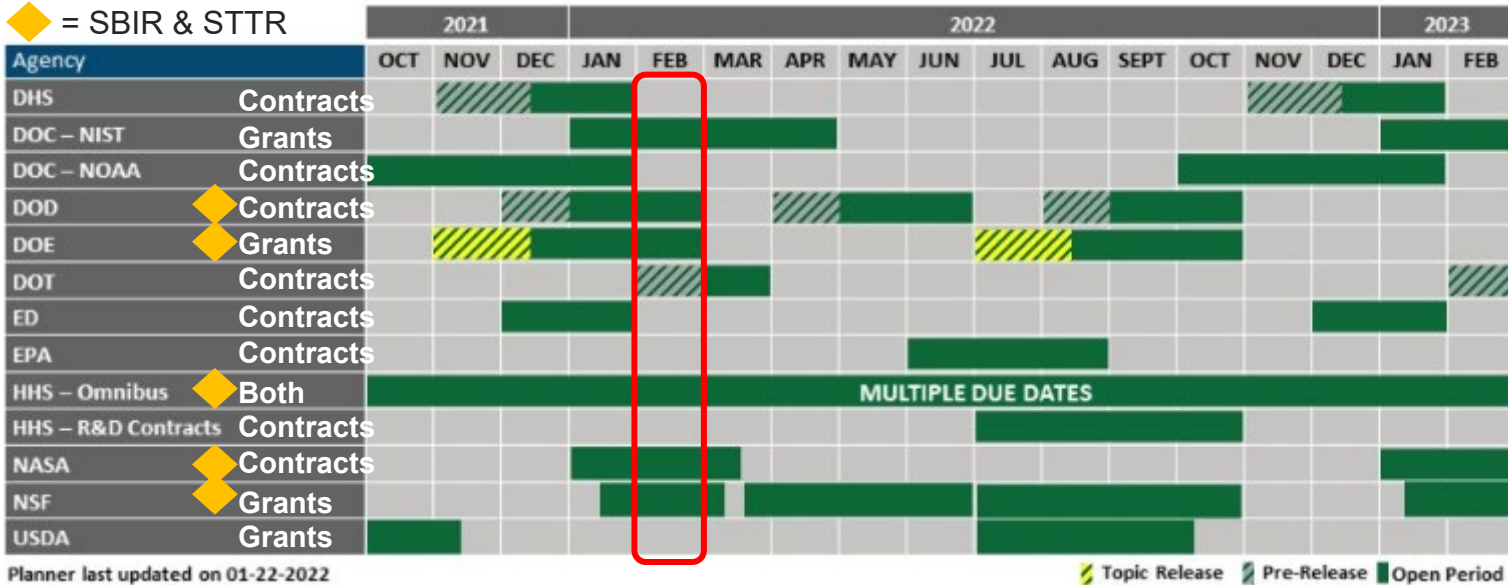
Links

- <https://aaf.dau.edu/aaf/contracting-cone/>

Funding – SBIR/STTR

- Phase I: Idea Generation/Proof of Concept; SBIR/STTR-Funded at ~\$150K for 6-12 months
- Phase II: Prototype Development/Full R&D; SBIR/STTR Funded at ~\$1M for 24 Months
- Post Phase II: NASA, Air Force, Navy, Dept of Energy all have post Phase II prior to Phase III; Funding is agency dependent
- Phase III: Infusion/Commercialization/Production; Funding is agency dependent
- STTR: Requires non-profit research institution partner, PI at either small business or research partner; Minimum work is 40% small business, 30% research partner;

◆ = SBIR & STTR



Planner last updated on 01-22-2022

◆ Topic Release ▨ Pre-Release ■ Open Period

For more information on SBIR/STTR: <https://www.sbir.gov/solicitations/open>

DoD SBIR/STTR

SBIR/STTR: <https://www.sbir.gov/solicitations/open>

Current Dept. of Air Force Opportunities:

- SpaceWERX Orbital Prime STTR (AF X21.S CSO), closes February 17th
- AFWERX Direct-to-Phase II, Open-Topic (Air Force X22.1 CSO), closes February 10th
- DAF specific Phase I and D2P2 topics (DoD SBR/STTR 2022.1/A), closes February 10th

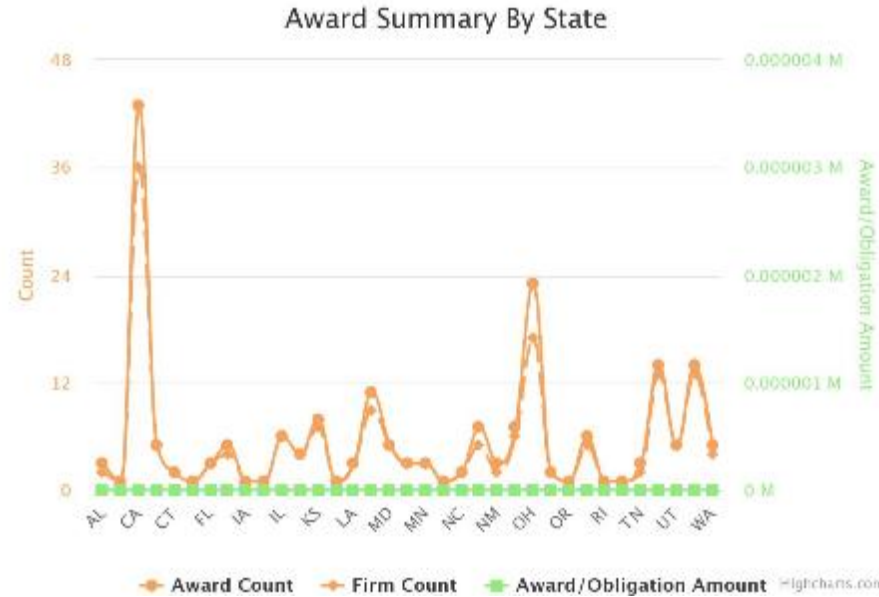


SBIR/STTR Awards

OFRN Funded Project Follow-on

Total	\$17,617,297
By Generating OFRN Round	
OFRN Round 1	\$6,600,000
OFRN Round 2	\$3,399,906
OFRN Round 3	\$1,395,000
OFRN Round 4	\$6,222,391
OFRN Round 5	TBD
By Agency	
Air Force - AFWERX	\$4,379,906
Air Force - All	\$9,272,297
Army	\$1,345,000
DHA	\$2,950,000
DOE	\$760,000
NASA	\$1,775,000
Navy	\$210,000
NSF	\$1,225,000

Agility Prime (Flying Orbs) STTR Awards



U.S. Gov't Business Arrangements

○ **Assistance:**

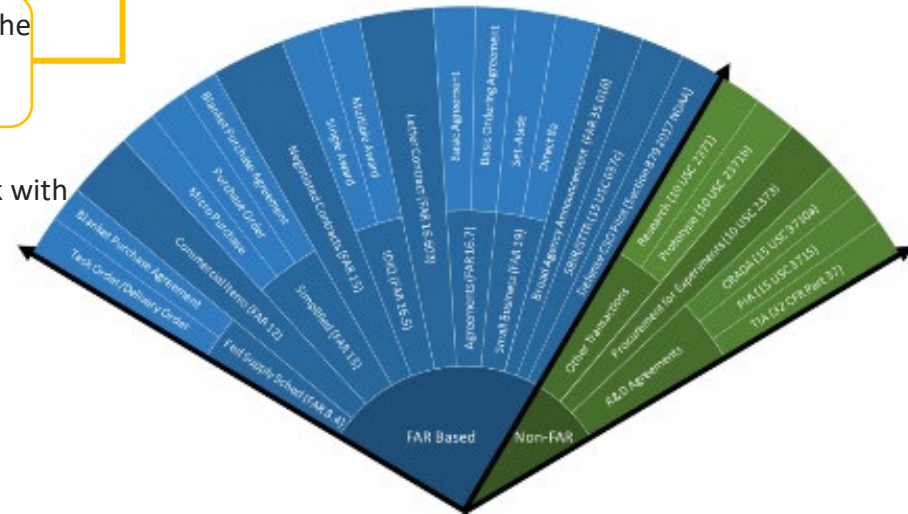
- **Grant:** Used to acquire basic research (6.1), transfer thing of value to recipient to carry out public purpose of support or stimulation—little government involvement
- **Cooperative Agreement:** Same as a grant, but with substantial government involvement
- **Technology Investment Agreement (TIA):** Increase commercial involvement in defense research programs

Broad Area Announcement (BAA):
Used to obtain proposals for basic and applied research and development to advance or evaluate cutting edge technologies, not related to a specific system or hardware requirement.

- **Contracts:** acquire property or services for the direct benefit or use of the Federal Government.

○ **Agreements:**

- **Partnership Intermediary Agreements:** Gov't<->Nonprofit to work with small business/academia to identify joint activities
- **Other Transactions:** Flexible agreements not subject to federal acquisition regulations



Links

- <https://aaf.dau.edu/aaf/contracting-cone/>

Broad Area Announcements (BAA)

- **Open:**
 - White paper and/or proposal at any time within a specified period, evaluated when received.
- **Closed:**
 - Submission: White paper and/or proposal submittals by a specified date and time as set forth in the BAA.
- **Calls:**
 - This technique allows for publication of a basic BAA solicitation that contains overarching information but does not request white papers or full proposals.
 - The basic BAA often functions as a framework identifying the technical areas and giving the basic terms and administrative information of the BAA.
 - The requests for white papers and/or proposals are transmitted via Calls that are published separately from the basic BAA at various times during the open period of the basic BAA
 - The first Call may be published with the basic BAA.

BAAs sometimes release as both a Contract and Grant

- **1-Step:**
 - Requests full technical and cost proposals from each offeror (i.e. no white paper phase).
- **2-Step:**
 - The two-step process is sometimes used when a large number of proposals are anticipated.
 - Potential offerors are invited to submit brief descriptive white papers in lieu of full proposals.
 - Full proposals are requested from those offerors selected in the white paper evaluation process. When proposals are received, they are evaluated and selected.

Links

SAM.GOV

DOE/EERE: <https://eere-exchange.energy.gov/>

NASA NSPIRES: <https://nspires.nasaprs.com/external/>

AF Tech Connect: <https://airforcetechconnect.org/>

How it works: Opportunities Booths

From 11 am – 12 pm (or longer if you need), please visit the Networking Booths. Booths have tables that align with specific opportunities that are tied to today's topics and have merit to facilitate collaboration and partnership discussions and enable team building for larger proposals.

Booth topics:

- Advanced Manufacturing & Materials
- Sensors & Electronics
- Please note, Digital Engineering is integrated into many opportunities

Special thanks to our volunteers who will help us monitor discussions to help build future events and teams and help you all win more awards! For example, homing in on and detailed briefing on government agencies of interest.

Joint University Microelectronics Program 2.0 Research Center (JUMP 2.0)

Sensors & Electronics

DARPA-SN-22-16

Description

The Semiconductor Research Corporation (SRC) in cooperation with the DARPA, solicits white papers from U.S. universities for collaborative, multidisciplinary, multi-university research in selected areas of principal interest. The goal of this collaborative effort between the DOD and the industrial participants is to substantially increase the performance, efficiency, and capabilities of broad classes of electronics systems for both commercial and military applications. JUMP 2.0 program is focused on exploratory research on an 8- to 12-year time horizon that is anticipated to lead to defense and commercial opportunities in the 2030–2035 timeframe.

DARPA is looking to JUMP 2.0 to set the foundation for future DARPA programs. Both SRC and DARPA have been highly vocal about including new universities for fresh perspectives.

Centers -

System Themes: 1) Cognition; 2) Communications and Connectivity; 3) Intelligent Sensing to Action; 4) Systems and Architectures for Distributed Compute; 5) Intelligent Memory and Storage;

Technology Themes: 6) Advanced Monolithic and Heterogeneous Integration; 7) High-performance Energy-Efficient Devices for Digital and Analog Applications

Procurement Status

Release Date: December 22, 2021

White Paper Due Date: March 7, 2022

Solicitation Approach: Closed, 2-Step

Number of Awards: 7 centers

Funding:

Centers, \$5M - \$7M/yr (~20 PIs)

Median Task size: ~\$250k/yr

Technical POCs

Dev Palmer,
dev.palmer@darpa.mil,
JUMP 2.0 PM

Phillip Chang,
tsu-hsi.chang.ctr@darpa.mil,
JUMP 2.0 Technical Support Lead

jump2.0-solicitation@src.org

Proposers Day Video Recording and Briefings:

<https://www.src.org/calendar/e007507/>

<https://src.secure-platform.com/a/page/2021-JUMP-2.0-Center-RA>

Description

A program to support early studies of innovative, yet credible, visionary concepts that could one day “*change the possible*” in aerospace, funded through the Space Technology Mission Directorate (STMD). Specifically funding high risk, high reward projects that are in early-state for NASA missions 10 – 20+ years out. Solicited from any field of study that offers a radically different approach or disruptive innovation that may significantly enhance or enable new human or robotic science and exploration missions

Phase I funds project that establish concept feasibility for TRL 2 or lower at start of award. Phase II and III are down selects from the prior phase.

Proposed NIAC concepts must demonstrate innovation and have a clear potential impact in transforming future missions

Procurement Status

Expected Release Date: Typical Release Dates

Phase I ~ Early June, Phase II ~ Oct, Phase III ~ Dec

Solicitation Approach: Two step, closed

Number of Awards: Multiple

Funding:

Phase I: Up to \$175K over 9 months, 12 – 16 awards/year

Phase II: Up to \$500K over 2 years, 5 - 7 awards/year

Phase III: Up to \$2M over 2 years, 1 award/year

FY22 NASA Justification book requested additional funding for NIAC

Technical POC

Jason Derleth

NIAC Program Executive

STMD, NASA Headquarters

hq-niac@mail.nasa.gov

Sensors & Electronics

FA9453-19-S-0002

Description

Requesting research and development (R&D), modeling and simulation (M&S), fabrication, experimentation, characterization, testing, demonstration, prototyping, and analysis related to all aspects of space-flight systems to develop, integrate, mature, demonstrate, and transition space technologies (TRL 3-6). Develop and acquire, space domain-related signal, transportation, energy, and space-flight supplies including parts, accessories, and designs thereof. AFRL/RV is interested in maturing space-domain technologies related to space-flight, signals, transportation, and energy from early functional proof of concept through demonstration of full system or architecture prototypes.

- Space vehicle functionality and logistics: Enhance core spacecraft components and subsystems to enable game-changing improvements in agility, resilience, affordability and performance for DoD spacecraft
- Mission effects and capabilities: Provide decisive mission capabilities and reliable space services to enable the joint warfighter to control the space domain and exploit it to support control of other domains
- Space system/services anomaly detection, attribution, and protection: Develop analytic tools and sensors to predict, detect, and aid in distinguishing the effects of natural and man-made threats to spacecraft, payloads and space services
- Space Battle Management, Command, and Control: Enable uninterrupted delivery of tactical, operational and strategic space services within a contested environment by providing unprecedented domain awareness; accurate and timely battle management tools; and robust command and control options.

Procurement Status

Most Recent Post Date: 3/15/2021

Date Offers Due: 3/31/2025

Solicitation Approach: Open Research Announcement, Two Step

Number of Awards: Multiple. Individual award amounts will vary. However, the estimated award values will range from \$50,000 to \$100,000,000 (27 awards already made, average of \$7.5M/award)

Funding: 6.2-6.7 and other as appropriate, unspecified ceiling

Timeline: 150 Days from receipt of white paper to award

Technical POC

Program Manager:

Mr. Michael P. Lopez,
AFRL/RVSW,
505-846-7790,
michael.lopez.44@spaceforce.mil

Technical Advisor:

John Beauchemin,
AFRL/RVS
john.beauchemin.1@us.af.mil

Contracting POC

Maria Z. Parker
Contract Specialist
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+1 505-846-6188

Daniel J. Alvarado
Contracting Officer
daniel.alvarado.12@us.af.mil
+1 505-853-6619

<https://airforcetechconnect.org/>

<https://sam.gov/opp/195cbb3970e98970d2b406a522222ddf/view>

Government Requirement for Advanced Power and Energy (GRAPE)

Sensors & Electronics

FA8650-18-S-5008

Description

The Advanced Power Technology Office (APTO), located in the Air Force Research Laboratory, Materials and Manufacturing Directorate, Systems Support Division, Acquisition Systems Support Branch (AFRL/RXSC) is soliciting white papers. This program shall identify new and emerging advanced power generation and energy efficient technologies to be further developed and transitioned to meet military needs across the Air Force. Emphasis will on technologies that provide cost reductions, reliability improvements, and enhancements to the performance of Air Force (AF) Aviation, Expeditionary, Installation, and Ground Support. Technology maturity at the system/subsystem model or prototype demonstration in a relevant environment (Technology Readiness Level 6) is highly preferred in order to enable an APTO technology demonstration. (Period of Performance: 12 – 24 months)

Procurement Status

Latest update: Nov 10, 2021

Solicitation Approach: Multiple (including Open, 2-Step)

Number of Awards: 3 awards already made (~\$7.6M)

Funding:	FY22	FY23	FY24	FY25
	\$9.8M	\$9.75M	\$9.75M	\$9.75

Technical POC

Albert "Bud" Boulter
937-656-5709
Albert.boulter@us.af.mil

Contracting Officer
Charlotte M. Chumack
charlotte.chumack@us.af.mil
937-713-9876

<https://airforcetechconnect.org/>

<https://sam.gov/opp/a3843838ff041fda4edccc93f78cfd4/view>

Description

A standing, open invitation to the scientific and technical communities to fund pioneering research and development (R&D) projects in support of our nation's security. Its purpose is to advance our scientific and technical knowledge and to apply such advances to the department's operational environments.

A traditional Broad Agency Announcement (BAA) is fairly specific in its subject matter requirements. The LRBAA is not. By design, it covers a wide range of subjects and is short on details. This enables S&T to contemplate proposals for original research that fall outside the scope of its more narrowly defined BAAs. Priority Research & Development areas of interest: Securing Aviation, Securing Borders, Securing Cyberspace, Preventing Terrorism, Managing Incidents.

Procurement Status

Expected Release Date: 6/4/2018

Solicitation Approach: Open, 2-step BAA

Number of Awards: Multiple

Funding:

- C-UAS = \$35M/yr
- Maritime Defense: \$23M/yr
- Air, Land, and Port of Entry Security: \$40M/yr
- First Responder/Disaster Resilience: \$64M/yr

Technical POC

Jenista Tobias

jenista.tobias@hq.dhs.gov

Submit request to engage Technical SME @
<https://oip.dhs.gov/baa/public/funding-page?status=open>

<https://www.dhs.gov/science-and-technology/st-lrbaa>

Naval Air Warfare Center Aircraft Division WOLF Airborne Systems Integration (ASI) Division

Sensors & Electronics

N68335-21-R-0315

Description

The Naval Air Warfare Center Aircraft Division (NAWCAD) Webster Outlying Field (WOLF) Airborne Systems Integration (ASI) Division develops advanced air platforms, sensors (e.g., acoustics, EO/IR, radar, magnetics, and other special sensors), and systems. The purpose of these sensors and surveillance systems is to support a variety of aviation missions including Air Undersea Warfare (USW), airborne strike, air warfare, counter-air, close air support and interdiction, defense suppression, communications relays, digital interoperability, electronic attack, naval warfare and amphibious strike, Counter Unmanned Systems (C-UxS), and anti-surface warfare. Most of the air platforms will be small unmanned Group 1 to Group 3. Sensors could be air deployed (via manned or unmanned aircraft); ground, surface, and undersea deployable sensors may also be included as driven by the mission(s).

This BAA not only includes sensors, sensor data processing, and sensor systems, but it also includes mathematical modeling of the sensors and air platforms, communication techniques between the sensors and/or platforms, interfaces, software development, the fusion and exploitation of multi-sensor data, studies, and other techniques used to develop advanced capabilities and reduce the cost of transitioning sensors technologies to the fleet. Furthermore, this BAA shall cover development and analysis of related air, sea, and land clutter detection models using relevant sensor data.

Procurement Status

Expected Release Date: 7/7/2021

Solicitation Approach: Open, 2-Step

Number of Awards: Multiple

Funding:

Contract POC

Trevor Greig

trevor.greig.1@us.navy.mil

+1 240-577-8662

LeAnn Spann

Leann.spann@navy.mil

Sensors & Electronics

TBD

Adv Manufacturing & Materials

Description

Funded through the Space Technology Mission Directorate (STMD) to accelerate the development of groundbreaking technologies that support and enable lunar surface activities to be conducted both by NASA and the commercial space sector under Artemis and the Lunar Surface Innovation Initiative (LSII).

The starting TRL of the efforts to be funded as a result of this Appendix will be TRL 2 - TRL 4; TRL advancement is required.

LSII has six focus areas: In-Situ Resource Utilization, Sustainable Power, Extreme Environments, Extreme Access, Surface Excavation/Construction, and Lunar Dust Mitigation. This inaugural release of the LuSTR Opportunities Appendix features six topics that address specific challenges in two of the LSII focus areas: In Situ Resource Utilization and Sustainable Power.

Procurement Status

Expected Release Date: July 2022

Solicitation Approach: One step, closed

BUT Notice of Intent submission is encouraged

Number of Awards: At minimum 6, likely more

Funding: \$1M - \$2M per award

FY22 NASA Justification book requested additional funding for LuSTR

Technical POC

Claudia Meyer

Space Technology Research Grants Program Executive

hq-LuSTR@mail.nasa.gov

Clean Energy Manufacturing Institute for Industrial Decarbonization

Adv Manufacturing & Materials

TBD

Description

Develop and manage an R&D Consortia (Manufacturing Institute) to provide shared research facilities and support the manufacturing workforce to accelerate technology development and facilitate the transfer of innovative advanced manufacturing technology to U.S industry. AMO received FY21 appropriations to launch a seventh Institute. Two focus areas are of particular interest are: Electrification of Industrial Processes, and Decarbonization of Metal Manufacturing.

Procurement Status

Expected Release Date: TBD

Solicitation Approach: FOA

Number of Awards: 1

Funding: Yes

Technical POC

Decarb-Institute@ee.doe.gov

DE-FOA-0002573

Adv Manufacturing & Materials

Description

This FOA supports multiple avenues for localities to improve their energy efficiency, reduce carbon emissions, and bolster their local workforce through research, development, demonstration, and deployment (RDD&D) projects for renewable-fueled energy systems and technical assistance to support manufacturers in adopting innovative, smart technologies to help better manage their energy use.

Topic Area 1: Advanced Technology Demonstration in a Renewably Supplied District Energy System

Topic Area 2: Regional Initiative to Integrate Smart Manufacturing and Energy Management Systems

Procurement Status

Release Date: January 25, 2022

Application Deadline: March 18, 2022

Solicitation Approach: One-step

Number of Awards: Two to three awards for topic 1 and one award for topic 2

Funding: FY22-FY25

\$7.5M

\$7M to topic 1 over 24-36 months

\$500K for topic 2 over 12-24 months

Technical POC

AMOTPFOA@ee.doe.gov

Manufacturing Technology BAAs

Multiple - See Below

Adv Manufacturing & Materials

Description

The focus of DoD Manufacturing Technology (ManTech) program is primarily on projects that continue to advance the systems engineering approach needed for the design, fabrication, and manufacture of structural components to address challenges in system weight, performance, affordability, and/or survivability. The intent is to bring together materials designers, materials suppliers, product designers, and manufacturers to collaborate on the design, production, and commercialization of novel affordable, manufacturable systems. Projects may include basic and applied research, technology and component development, and prototyping; but may also focus on manufacturing supply-chain technical support and integration, workforce development, and manufacturing education.

- **Air Force** - Manufacturing Research and Technology Development
 - FA8650-21-S-5001
- **Navy** - Science and Technology for Advanced Manufacturing Projects (STAMP)
 - N00014-22-S-B002
- **Army** - Manufacturing Technology Funding Opportunity Announcement
 - W911NF-20-S-0011
- **DLA** - Broad Agency Announcement (BAA) for Battery Network (BATTNET)
 - BAA006-21)
- **DLA** - Military Unique Sustainment Technology II (MUST-II)
 - BAA0001-20



FY21: Army~\$59M; Navy~\$57M; AF~\$43M; \$56M

FA8650-18-S-5010

Adv Manufacturing & Materials

Description

Air Force Research Laboratory, Materials & Manufacturing Directorate (AFRL/RX) is soliciting white papers and potentially technical and cost proposals under this announcement that support the needs of the Structural Materials and Applications mission. Interest areas includes: ceramics and ceramic matrix composites materials and processing; polymer matrix composites materials and processes; composite performance prediction; metallic materials and processes; characterization, sensing, and analytics; integrated computational materials science and engineering (ICMSE); that apply to propulsion, space, munitions, hypersonics and thermal protection, and sustainment. Also of interest, airframe hardened structures, multifunctional structures, and advanced electromagnetic and directed energy structures.

Procurement Status

Published Date: 6/1/2018

Date Offers Due: 9/20/2023

Solicitation Approach: Open, 2 Step

Number of Awards: Approximately 3 awards/year since 2018

Estimated program cost: \$100K - \$8M/award

Technical POC

Pat Carlin

AFRL/RXC

937-255-9800

Patrick.carlin.1@us.af.mil

Contracting Officer

Jason McClean

AFRL/RXKMC

937-713-9896

Jason.mcclean.6@us.af.mil

<https://airforcetechconnect.org/>

BAA0002-20

Adv Manufacturing & Materials

Description

This BAA addresses DLA's need for scientific study and experimentation directed toward advancing the state-of-the-art or increasing knowledge or understanding in Areas of Interest not anticipated by DLA's annual R&D program planning and development processes. Interested parties may submit an initial synopsis, referred to as a "White Paper," describing a specific project related to an Area of Interest listed in Attachment B to this BAA, which DLA may amend from time to time to add, modify, or delete Areas of Interest. If a White Paper is of sufficient interest, DLA may request technical and cost proposals for the effort described by the White Paper.

Current Areas of Interest: Medical Logistics, Distribution, Advanced Manufacturing, Digital Engineering for Logistics and Parts, Smart Connected Logistics, Anti-counterfeiting Technical Solutions, Energy Research, AI/ML Applications, Strategic Materials (Energetics, Energy and Power, Aeronautical and Astronautical, Armor, Stable Isotopes, Paints/Coatings/Surface treatments, Mining, Refining, Recycling, Permanent Magnet Recycling, and Permanent Magnet Manufacturing), Lithium Battery Deactivation, Blockchain Logistics, Edge Computing, and Acquisition Modernization Technology Research (AMTR).

Procurement Status

Expected Release Date: 9/10/2020

Solicitation Approach: Open, 2-Step

Number of Awards: TBD

Funding: FY22

\$4.5M

Technical POC

Logistics.Research@dla.mil

Contracting POC

randd.dcco@dla.mil

+1 215-737-5101

Who Can Help

1. **Ohio Federal Research Network (OFRN):** <https://ohiofrn.org/>
 1. Identify opportunities
 2. Build teams and connections
 3. Lead a team proposal

2. **Academic Partnership Engagement Experiment (APEX):** <https://apex-innovates.org/>
 1. SBIR/STTR Process Navigation
 2. Team Matchmaking
 3. PLH/Massive Online Open Curriculum ... Free training ... see slide in back-up

3. **Others:**
 1. Procurement Technical Assistance Centers (PTAC): <http://aptac-us.org/new/>
 2. Small Business Development Centers (SBDC): <https://www.sba.gov/tools/local-assistance/sbdc>
 3. Ohio's Federal And State Technology (FAST) @ Ohio Aerospace Institute (OAI): <https://oai.org/>
 4. Wright Brothers Institute (WBI): <https://www.wbi-innovates.com/>
 5. Ohio Third Frontier Program (find out about your local Entrepreneurial Services Provider (ESP)):
<https://ohio.gov/business/resources/ohio-third-frontier>

Useful Links

1. **[SAM.Gov & grants.gov](#)**
2. **Air Force Tech Connect:** <https://airforcetechconnect.org/>
3. **DARPA Opportunities:** <https://www.darpa.mil/work-with-us/opportunities>
4. **Department of Air Force R&D Opportunities:** (See grants.gov and sam.gov, also <https://www.afwerx.af.mil/industry-guide.html>)
5. **NASA R&D Opportunities:** <https://nspires.nasaprs.com/external/>
6. **Department of Energy/EERE Opportunities:** <https://eere-exchange.energy.gov/>
7. **Army R&D Opportunities:** <https://www.arl.army.mil/business/>
8. **Navy R&D Opportunities:** <https://www.onr.navy.mil/en/work-with-us/funding-opportunities>
9. **SBIR/STTR:** <https://www.sbir.gov/funding>
10. **Small Business Administration Subcontracting Network (SubNet):** https://eweb1.sba.gov/subnet/client/dsp_Landing.cfm
11. **APEX Resources page (add'l DoD and SBA links):** <https://apex-innovates.org/academic-partnership-engagement-experiment-resources>
12. **Parallax Learning Hub's MOOC (Free Online Training):** <https://parallaxresearch.docebosaas.com/learn/signin>
13. **SBIR/STTR Process Navigation & Matchmaking:** <https://apex-innovates.org/services/academic-partnership-engagement-experiment-sbirsttr-process-navigation>
14. **DoD Congressional Justification Books:** <https://comptroller.defense.gov/Budget-Materials/>
15. **DHS Congressional Justification Book:** https://www.dhs.gov/sites/default/files/publications/science_and_technology_directorate_0.pdf
16. **National Defense Authorization and Appropriations Acts:** <https://whs-mil.libguides.com/dodappropriationslaws>

How it works: Opportunities Booths

From 11 am – 12 pm (or longer if you need), please visit the Networking Booths. Booths have tables that align with specific opportunities that are tied to today's topics and have merit to facilitate collaboration and partnership discussions and enable team building for larger proposals.

Booth topics:

- Advanced Manufacturing & Materials
- Sensors & Electronics
- Please note, Digital Engineering is integrated into many opportunities

Special thanks to our volunteers who will help us monitor discussions to help build future events and teams and help you all win more awards! For example, homing in on and detailed briefing on government agencies of interest.

Contact Us

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Beavercreek, OH 45431

Phone:

(937) 705-1000

Email:

ofrn@parallaxresearch.org

Website:

<https://ohiofrn.org>



Ohio
Federal
Research
Network

Driving Innovation Through Strategic Partnerships

Back-up

Funding Faculty & Students

University Research Initiatives

- 2022 Laboratory University Collaboration Initiative (LUCI) <https://basicresearch.defense.gov/Pilots/Laboratory-University-Collaboration-Initiative/>
- Defense Established Programs to Stimulate Competitive Research (DEPSCoR): <https://basicresearch.defense.gov/Pilots/DEPSCoR-Defense-Established-Program-to-Stimulate-Competitive-Research/>
- Multidisciplinary University Research Initiative (MURI) ([AF](#)) ([Army](#)) ([Navy](#))
- Defense University Research Instrumentation Program (DURIP) ([AF](#)) ([Army](#)) ([Navy](#))
- Vannevar Bush Science & Engineering Faculty Fellowship (VBFF) ([DoD](#))
- University Affiliated Research Centers (UARC) ([DoD](#)) ([Examples](#))
- Presidential Early Career Award for Scientists and Engineers (PECASE) ([Army](#))
- Young Investigator Program (YIP)/Early Career Program (ECP) ([Navy](#)) ([AF](#)) ([Army](#))

Student / Faculty

- National Research Council (NRC) Research Associate Programs: <https://sites.nationalacademies.org/PGA/RAP/index.htm>
- National Defense Science and Engineering Graduate (NDSEG): <https://ndseg.org/>

DARPA

- Young Faculty Award: <https://www.darpa.mil/work-with-us/for-universities/young-faculty-award>

Air Force: <https://www.afrl.af.mil/About-Us/Fact-Sheets/Fact-Sheet-Display/Article/2282123/afosr-funding-opportunities-educational-programs/>

- Visiting Scientist Program (VSP)
- Awards to Stimulate and Support Undergraduate Research Experiences (ASSURE)
- Engineer and Scientist Exchange Program (ESEP)
- AFRL Science & Technology Fellowship Program (STFP)
- USAF Summer Faculty Fellowship Program (USAF-SFFP)
- Windows on Science (WOS)
- Windows on the World (WOW)

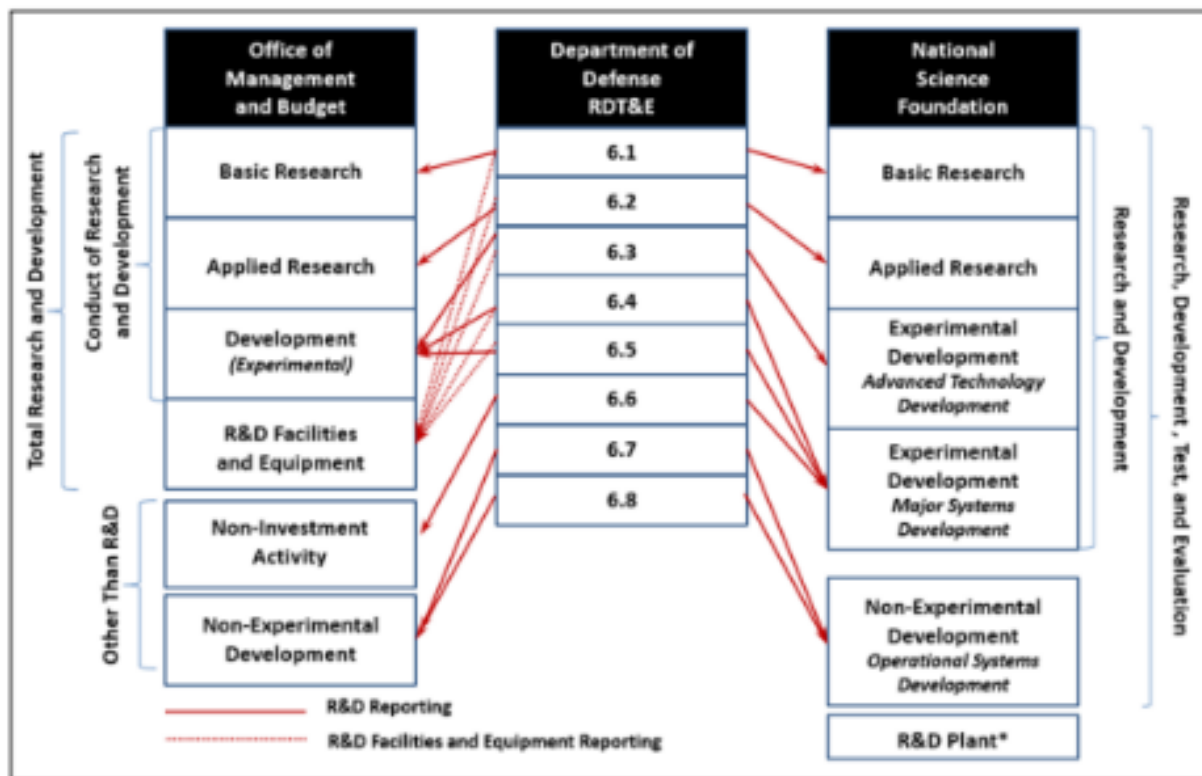
Army:

- Oakridge Associated Universities (ORAU): <https://www.orau.org/arlfellowship/>

Navy

- Naval Research Enterprise Intern Program (NREIP): <https://www.onr.navy.mil/Education-Outreach/undergraduate-graduate/NREIP-naval-internship>
- Science, Mathematics and Research for Transformation (SMART): <https://www.onr.navy.mil/Education-Outreach/undergraduate-graduate/SMART>
- Sabbatical Leave Program (SLP): <https://www.onr.navy.mil/Education-Outreach/faculty/sabbatical-leave-program>
- Summer Faculty Research Program (SFRP): <https://www.onr.navy.mil/Education-Outreach/faculty/summer-faculty-research-program>

DOD RDT&E Crosswalks to OMB, NSF Taxonomies



Sources: CRS telephone and email communications with OMB and NSF, most recently October 1, 2020.

Notes: For FY2017 and subsequent years, OMB notes that budget activity 6.6, RDT&E Management Support, is reported to OMB as 'Non-Investment Activities' under the RDT&E title and is currently not included in federal calculations of R&D funding. OMB (in conjunction with DOD) will continue to evaluate the current approach of

U.S. Government R&D Funding

Table 1. Federal Research and Development Funding by Agency, FY2020-FY2022
(budget authority, dollar amounts in millions)

Department/Agency	FY2020 Actual	FY2021 Estimate	FY2022 Request	FY2021-FY2022	
				Dollar Change	Percentage Change
Department of Defense	62,438 ^a	63,350 ^a	62,800	-550	-0.9%
Dept. of Health and Human Services	44,455	43,494	51,232	7,738	17.8%
Department of Energy	19,476	19,312	21,452	2,140	11.1%
NASA	14,801	13,226	14,565	1,339	10.1%
National Science Foundation	6,800	7,408	8,173	765	10.3%
Department of Agriculture	2,989	2,965	3,609	644	21.7%
Department of Commerce	1,953	2,122	2,743	621	29.3%
Department of Veterans Affairs	1,366	1,420	1,498	78	5.5%
Department of Transportation	1,043	1,024	1,339	315	30.8%
Department of the Interior	1,094	1,033	1,221	188	18.2%
Department of Homeland Security	532	590	627	37	6.3%
Smithsonian Institution	516	524	585	61	11.6%
Environmental Protection Agency	237	445	473	28	6.3%
Department of Education	344	322	346	24	7.5%
Other	582	563	597	34	6.0%
Total	158,626	157,798	171,260	13,462	8.5%

Source: CRS analysis of data from EOP, OMB, *Analytical Perspectives, Budget of the United States Government, Fiscal Year 2022, Research and Development*, May 28, 2021, https://www.whitehouse.gov/wp-content/uploads/2021/05/ap_14_research_fy22.pdf.

Notes: Components may not sum to totals due to rounding.

- a. DOD R&D in this table does not include funding for budget activity (BA) 6.6 and BA 6.7. OMB considers BA 6.6 to be "non-investment activities" and BA 6.7 to be considered nonexperimental development. Combined BA 6.6 and BA 6.7 funding is \$46.2 billion in FY2021 and \$48.0 billion for FY2022.

Table 2. Federal R&D Funding by Character of Work and Facilities and Equipment, FY2020-FY2022

(budget authority, dollar amounts in millions)

Character of Work, Facilities, and Equipment	FY2020 Actual	FY2021 Estimated	FY2022 Request	Change, FY2021-FY2022	
				Dollars	Percentage
Basic research	44,290	42,985	47,387	4,402	10.2%
Applied research	45,992	44,843	51,126	6,283	14.0%
Development	62,124	65,739	68,136	2,397	3.6%
Facilities and Equipment	6,220	4,231	4,611	380	9.0%
Total	158,626	157,798	171,260	13,462	8.5%

Source: CRS analysis of data from EOP, OMB, *Analytical Perspectives, Budget of the United States Government, Fiscal Year 2022, Research and Development*, May 28, 2021, https://www.whitehouse.gov/wp-content/uploads/2021/05/ap_14_research_fy22.pdf.

Note: Components may not sum to totals due to rounding.

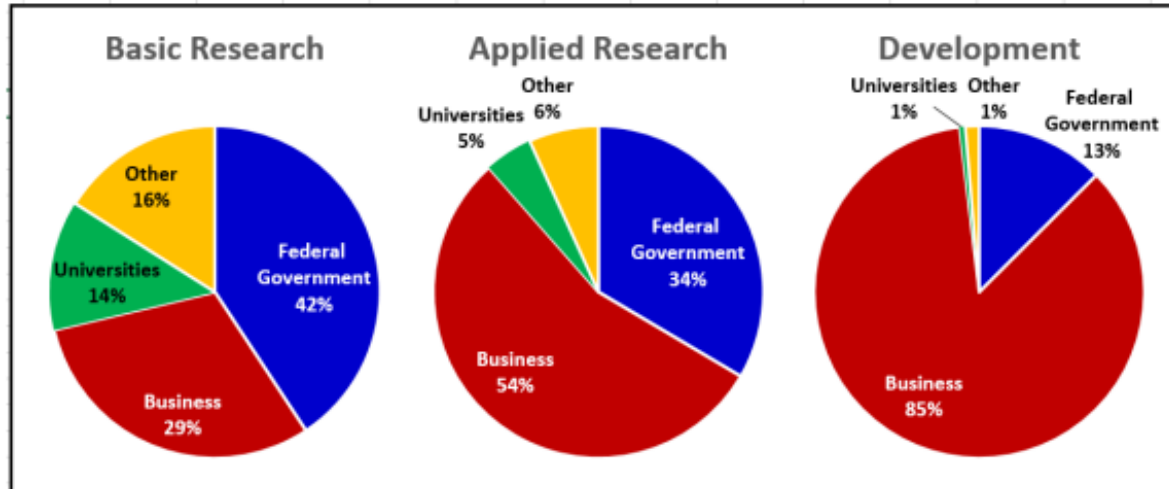
Table 3. Selected R&D Funding Agencies by Character of Work, Facilities, and Equipment, FY2020 Actual, FY2021 Estimated, and FY2022 Request

(budget authority, dollar amounts in millions)

Character of Work/Agency	FY2020 Actual	FY2021 Estimate	FY2022 Request	Change, FY2021-FY2022	
				Dollars	Percentage
Basic Research					
Health and Human Services	21,826	21,872	24,022	2,150	9.8%
NSF	5,437	5,966	6,532	566	9.5%
Energy	5,494	5,519	5,892	373	6.8%
Applied Research					
Health and Human Services	22,081	21,297	26,835	5,538	26.0%
Energy	8,444	7,395	7,669	274	3.7%
Defense	6,274	6,654	5,559	-1,095	-16.5%
Experimental Development					
Defense	51,764	54,045	54,859	814	1.5%
NASA	5,430	5,990	5,915	-75	-1.3%
Energy	3,060	3,715	5,206	1,491	40.1%

Who Received US Gov't R&D Funding?

Figure 1. Composition of U.S. Basic Research, Applied Research, and Development by Funding Sector, 2019



Source: CRS analysis of National Science Foundation, *National Patterns of R&D Resources: 2018–19 Data Update*, NSF 21-325, Tables 7-9, April 9, 2021.

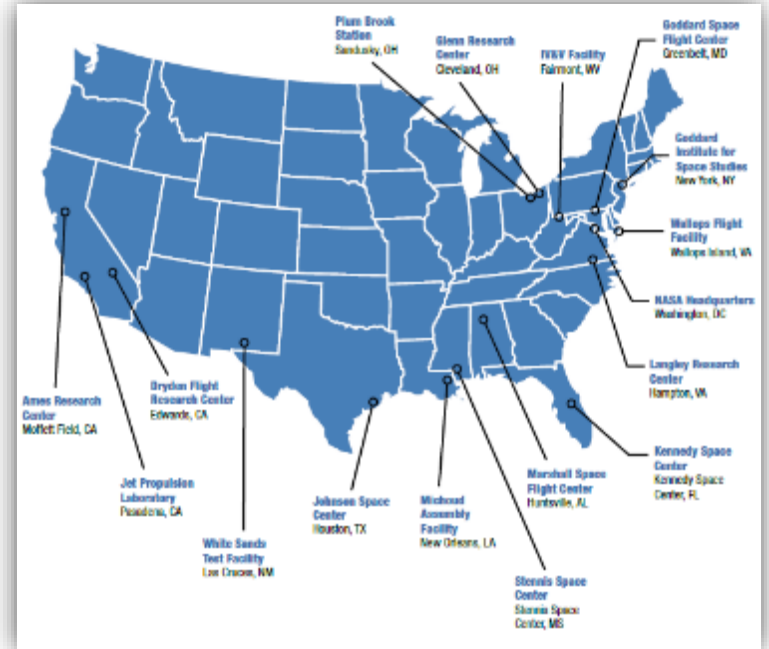
Notes: Components may not add to total due to rounding. Data are preliminary and may be revised.

NASA R&D Funding

National Aeronautics and Space Administration R&D
(budget authority, in millions of dollars)

	FY2021 Op. Plan	FY2022 Request	FY2022 H. Cmte.	FY2022 S. Draft	FY2022 Enacted
1 Science	7,301	7,931	7,970	7,901	
Earth Science	2,000	2,250	2,250	2,230	
Planetary Science	2,700	3,200	3,235	3,161	
Astrophysics	1,356	1,400	1,446	1,400	
James Webb Space Telescope	415	175	175	175	
Heliophysics	751	797	773	826	
Biological and Physical Sciences	79	109	90	109	
2 Aeronautics	829	915	935	940	
3 Space Technology	1,100	1,425	1,280	1,250	
4 Exploration / Deep Space Expl. Systems	6,517	6,880	7,279	6,960	
Exploration Systems Development	4,545	4,484	4,733	4,604	
Exploration R&D	1,973	2,397	2,547	2,357	
5 Space Operations*	1,638	1,583	Not Specified (n/s)		
International Space Station	1,322	1,328	n/s	n/s	
Commercial Crew	300	155	n/s	n/s	
Commercial LEO Development	17	101	45	101	
Subtotal R&D	17,385	18,735	18,991*	18,758*	
Non-R&D Programs*	2,521	2,627	2,627*	2,615*	
Safety, Security, and Mission Services	2,937	3,049	3,030	3,064	
Associated with R&D [†]	2,565	2,674	2,662	2,689	
Construction & Environmental C&R	429	390	390	390	— [‡]
Associated with R&D [†]	374	342	343	343	
NASA, Total (R&D)	20,324	21,751	21,996*	21,789*	
NASA, Total	23,271	24,801	25,038	24,827	

Research Centers



Sources: FY2021 operating plan and FY2022 request from NASA FY2022 congressional budget justification, <http://www.nasa.gov/news/budget/>. FY2022 House committee from H.R. 4505 as reported and H.Rept. 117-97.

Funding Projects - NASA

NSPIRES: <https://nspires.nasaprs.com/external/>

NASA Solicitation Structure

- Solicitation Announcements: Solicitation can be stand alone or grouped together in an Omnibus Solicitation, e.g. ROSES (Research Opportunities in Space and Earth Sciences).
- Omnibus Solicitations: Contained within these Omnibus Solicitations are various program elements to which you may respond. You respond to a program element by applying for a grant in the form of a proposal.
- Program Elements: Each program element with an Omnibus Solicitation provides a technical description of the program as well as the program officer at NASA as your point of contact. If you have programmatic questions about an opportunity, contact the program officer listed in the solicitation.

NASA Opportunity Definitions

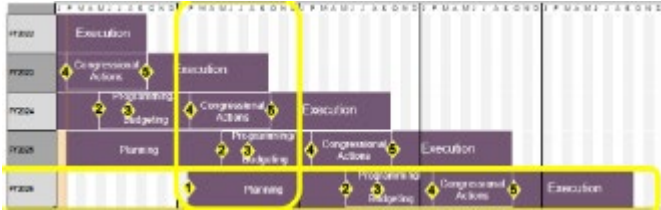
- Announcement of Opportunity (AO): This is generally used to solicit proposals for unique, high-cost research investigation opportunities that typically involve flying experimental hardware provided by the proposer on one of NASA's earth-orbiting or free-flying space flight missions. Selections through AO's can be for periods of many years, involve budgets of many millions of dollars for the largest programs, and usually are awarded through contracts, even for non-profit organizations, although occasionally grants are also used.
- NASA Research Announcement (NRA): An NRA is used to announce research interests in support of NASA's programs, and, after peer or scientific review using factors in the NRA, select proposals for funding. Unlike an RFP containing a statement of work or specification to which offerors are to respond, an NRA provides for the submission of competitive project ideas, conceived by the offerors, in one or more program areas of interest. NRAs may result in grants, contracts or cooperative agreements.
- Cooperative Agreement Notice (CAN): This is used to solicit ground-based research opportunities in which a fairly high degree of cooperation and interaction is expected between NASA and the selected institutions for completion of proposed research activities that further one of NASA's strategic objectives (e.g., to develop a research institute, an extensive educational/public outreach activity or provide technology transfer to develop a capability to enhance U.S. competitiveness). Further, the announced program intends a level of sponsorship, in the form of cost or resource sharing from both parties of the agreement. A CAN results in the award of a cooperative agreement.
- NASA Announcement (AN): This announcement is for a program in which non-funded selections of investigations are made on a competitive basis (e.g., to acquire new data from an operating space science mission). Typically, the AN has been used to award observation time on still-operating astronomical satellites, where due to imposed budget policies, funds were not available for continued data analysis. There is no official award instrument. Recipients receive a letter from NASA indicating that their proposal was selected and that there will be further contact with the NASA program office.

Doing Business with the Department of Defense

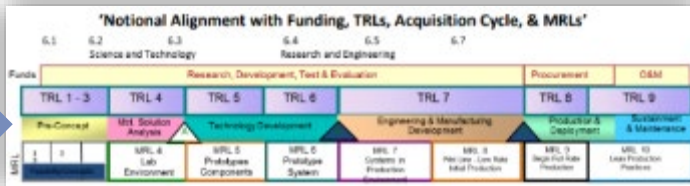
- Step 1: Identify your product or service
 - Know the Product Service Codes (PSCs) and the North American Industry Classification System (NAICS) Codes for your products, services or industry in which your organization normally does business.
 - Develop a capabilities statement aligned to your PSC and NAICS codes.
- Step 2: Register your business
 - Obtain a Data Universal Numbering System (DUNS) number
 - Register in the System for Award Management (SAM.gov)
 - Obtain a Commercial and government Entity (CAGE) code for U.S. businesses
 - Certify your business, if applicable (Woman Owned, 8a, etc)
- Step 3: Learn about Small Business programs
 - U.S. Small Business Administration (SBA)
 - DoD's Office of Small Business Programs (OSBP)
 - DoD's Small Business and Technology Partnerships Office (SB&TP)
- Step 4: Search Current DoD procurement opportunities
 - Visit Beta.SAM.gov
 - Investigate Federal Supply Schedules
 - Explore FedMall Contracts
 - Look for subcontracting opportunities on the SBA's SUBNet
 - Look at the GSA Acquisition Gateway
 - Explore the Other Transactions (OT) Guide
 - Review Open and upcoming Challenge Events
- Step 5: Get more assistance
 - Review SBA's Federal Contracting Guide
 - Locate a DoD Small Business Office (SBO)
 - Contact your local Procurement Technical Assistance Center (PTAC)
 - Contact your local Manufacturing Extension Partnership (MEP) office
 - Connect with the Trusted Capital Program

DoD Processes

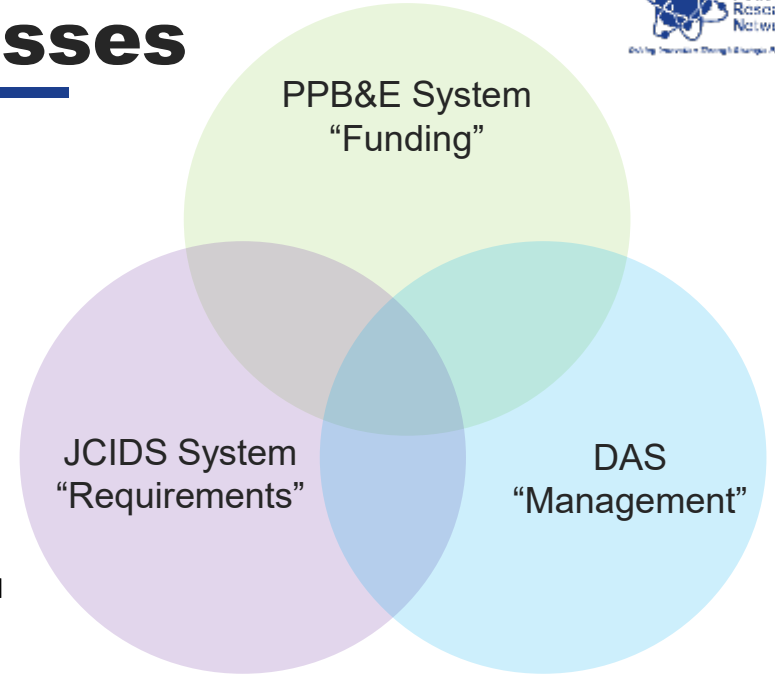
Planning, Programming, Budget, and Execution (PPB&E): Used for Financial Management and resource allocation for current and future DoD acquisition programs. The PPBE process consists of four (4) distinct but overlapping phases.



Defense Acquisition System (DAS): The process also identifies the specific statutory and regulatory reports and other information requirements for each Milestone Review and decision point. The DoD calls the system an event-based process where a program goes thru a series of processes, milestones, and reviews from beginning to end. Each milestone is the culmination of a phase where it's determined if a program will proceed into the next phase.



Joint Capabilities Integration and Development System (JCIDS): Support the statutory responsibility of the Joint Requirements Oversight Council (JROC) to validate joint warfighting requirements. It plays a key role in identifying the capabilities required by the warfighters to support the National Defense Strategy (NDS), the National Military Strategy (NMS), and the National Strategy for Homeland Defense.

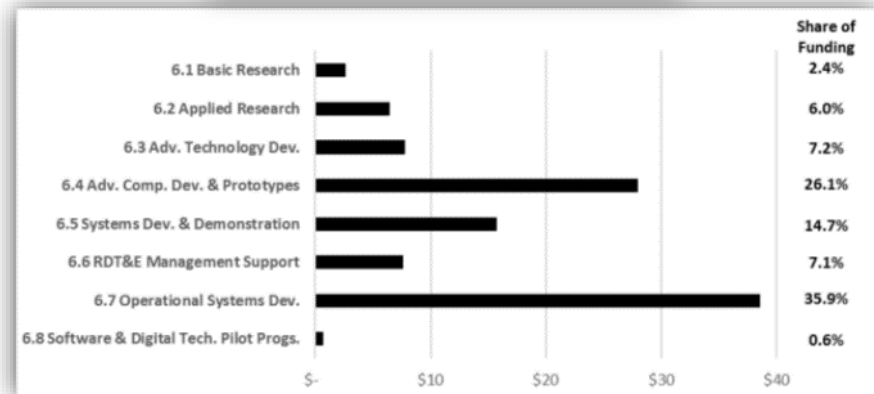
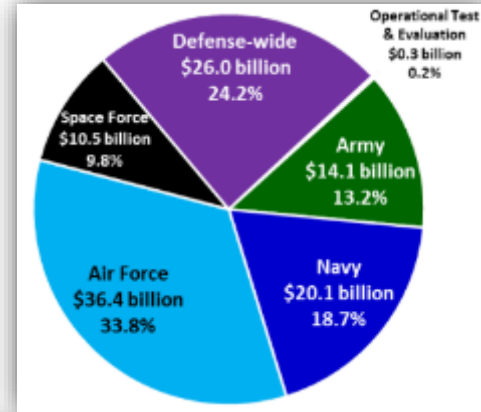


DoD RDT&E Funding

Research, Development, Testing & Evaluation (RDT&E)

Table 8. Department of Defense RDT&E
(total obligational authority, in millions of dollars)

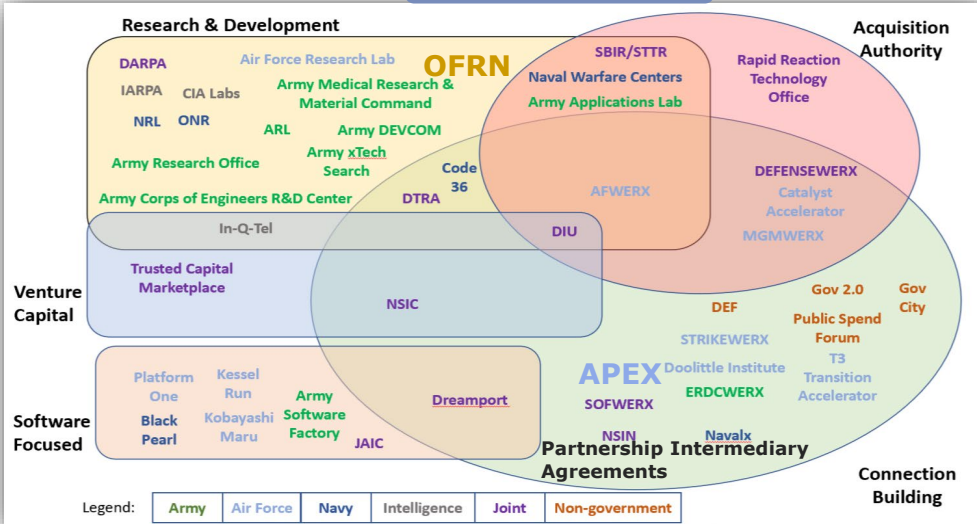
Budget Account	FY2021 Estimate ^a	FY2022 Request	FY2022 H. Cmte. H.R. 4432	F2022 Senate Draft S. 3023	FY2022 Enacted
Army	14,144.9	12,799.6	13,381.4	13,467.9	
Navy	20,138.4	22,639.4	20,694.7	21,546.5	
Air Force	36,360.8	39,184.3	39,062.4	40,098.7	
Space Force	10,540.1	11,266.4	10,774.3	11,642.6	
Defense-wide	26,013.5	25,857.9	26,239.5	29,120.2	
Director, Operational Test and Evaluation	257.1	216.6	216.6	276.6	
Total Title IV—By Account	107,454.8	111,964.2	110,368.8	116,152.5	
Budget Activity					
6.1 Basic Research	2,625.8	2,282.9	2,445.5	3,005.4	
6.2 Applied Research	6,436.3	5,508.9	5,917.3	6,531.9	
6.3 Advanced Technology Development	7,754.4	6,893.5	7,655.7	8,134.8	
6.4 Advanced Component Development and Prototypes	27,997.3	31,255.3	30,256.1	32,486.4	
6.5 Systems Dev. and Demonstration	15,748.0	15,760.8	15,121.1	14,865.0	
6.6 Management Support ^b	7,626.8	7,387.3	7,567.9	8,719.1	
6.7 Operational Systems Development ^c	38,602.8	40,591.5	40,106.9	41,704.7	
6.8 Software and Digital Technology Pilot Projects	663.4	2,284.1	1,320.4	705.2	
Undistributed Reductions			-22.0		
Total Title IV—by Budget Activity	107,454.8	111,964.2	110,368.8	116,152.5	



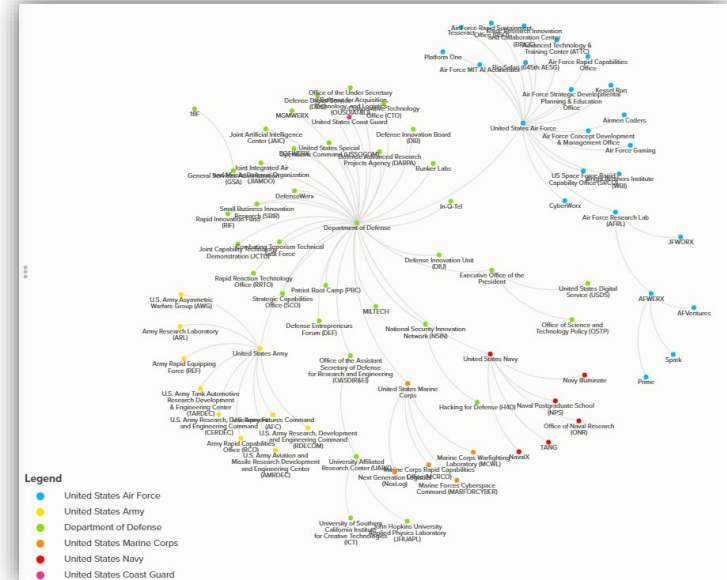
DoD Innovation Ecosystem

Charts from Defense Entrepreneurs Forum (DEF)

Prior Version



New Version



<https://medium.com/defense-entrepreneurs-forum/connections-within-the-defense-ecosystem-e9d605bfdc1d>

<https://kumu.io/aflazo/def-innovation-ecosystem-map#def-ecosystem-map>

Add your organization to the map by filing out the Google Form at this link: https://docs.google.com/forms/d/e/1FAIpQLSeqGGtXhSte9opnFRz_M2Ga8yXRzkdact96tYSEi4AvyvADAKQ/viewform

Air Force Materiel Command



Technology *Basic research and technology development to enable both evolutionary and revolutionary air, space and cyberspace capabilities*

Acquisition *Professional lifecycle acquisition management to deliver war-fighting capabilities affordably and on time from cradle to grave*

Testing *Unique facilities and expertise to validate and improve these capabilities in controlled and real-world environments*

Sustainment *Integration and management of maintenance/supply chain capabilities*

Air Force Research Laboratory



	Employees	Civilian	Military
Total	5,827	79%	21%
S&Es	3,455	80%	20%

AF Office of Scientific Research

- Aerospace, Chemical & Material Sciences
- Education & Outreach
- Mathematics, Information, & Life Sciences
- Physics & Electronics

AFOSR

Aerospace Systems

- Air Vehicles
- Control, Power & Thermal Management
- High Speed Systems
- Space & Missile Propulsion
- Turbine Engines

RQ

Directed Energy

- Directed Energy & EO for Space Superiority
- High Power Electromagnetics
- Laser Systems
- Weapons Modeling and Simulation

RD

Information

- Autonomy, C2, & Decision Support
- Connectivity & Dissemination
- Cyber Science & Technology
- Processing & Exploitation

RI

Human Performance

- Bio-effects
- Decision Making
- Human Centered ISR
- Training

711/RH

Munitions

- Fuze Technology
- Munitions AGN&C
- Munitions System Effects Science
- Ordnance Sciences
- Terminal Seeker Sciences

RW

Sensors

- Advanced Devices & Components
- Layered Sensing Exploitation
- Multi-Int Sensing (R/I/O)
- Space/Sea Warfare

RY

Space Vehicles

- Space Electronics
- Space Environmental Impacts & Mitigation
- Space EO/IR
- Space Experiments
- Platforms & Operations Technologies

RV

Materials and Manufacturing

- Functional Materials & Applications
- Manufacturing & Industrial Technology
- Structural Materials & Applications
- Support for Operations

RX

Air Force Tech Connect



Get Connected with the USAF

The Air Force & Space Force needs your ideas!

The Air Force Tech Connect is a new product provided by the U.S. Air Force to ensure more external innovations have a transformational impact on the U.S. Air Force and U.S. Space Force.

The Tech Connect team, comprised of Air Force Research Laboratory personnel, connects quality, relevant ideas and technologies with U.S. Air Force subject matter experts. The Tech Connect Team will review submitted ideas and inquiries, provide feedback and establish a dialogue between the submitter and potentially interested U.S. Air Force and U.S. Space Force programs.

APEX Alignment

APEX is based on a Partnership Intermediary Agreement (PIA)

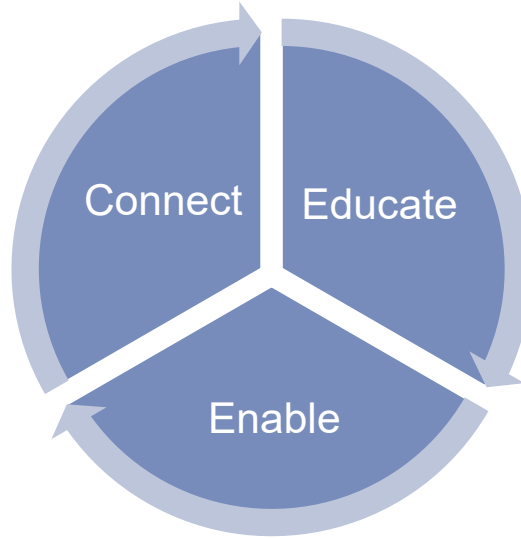


PIAs develop collaborative, technical relationships and promote better communications between the government and third parties



APEX is a DAF-wide asset, adding a focus on academia to the traditional engagement with small business and Primes/OEMs to facilitate technology acceleration & transition for S&T 2030

APEX Services



Get Connected

- National Outreach
- Navigation Services
- Team Matchmaking
- SBIR/STTR Webinars
- AF Tech Connect
- Marketing Communications
- Identify POCs within AFRL

Analytics to ID Solutions

- Capabilities Discovery
- Research Strength Evaluation
- Horizon Scanning
- Mapping Innovation Ecosystems
- Match People to Problems

Enabling Innovation

- Human Element of Innovation
- Blue Sky Workshops
- Challenge Problems
- High Performance Teams

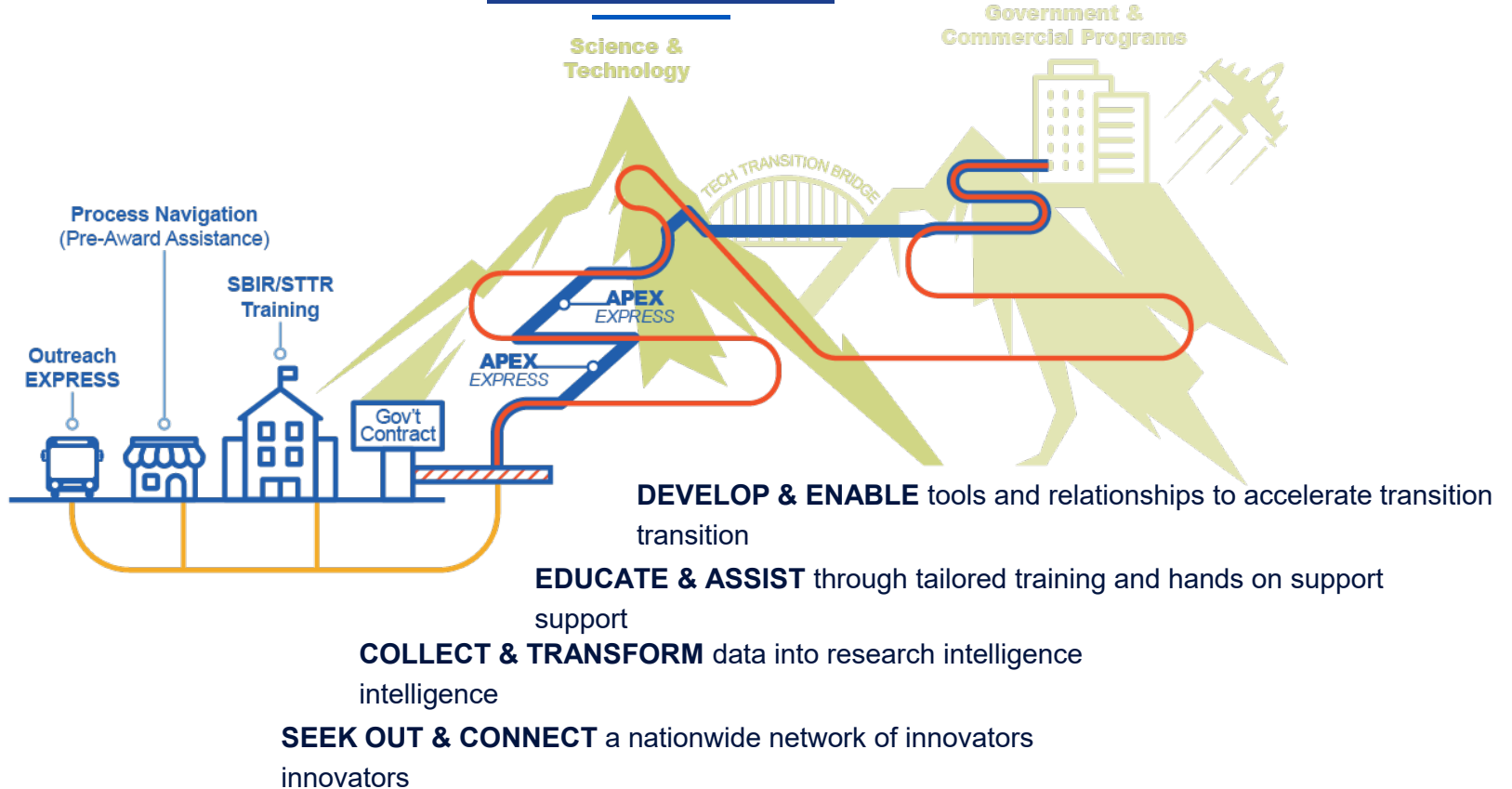
Build Human Capital

- HC Management Plans
- Workforce Development
- Online Education Tools
- Personnel Exchanges

Cross the Valley of Death

- Requirements Translation
- Capabilities Identification
- End-to-End Follow Through
- Tech Showcases
- Matchmaking and Support

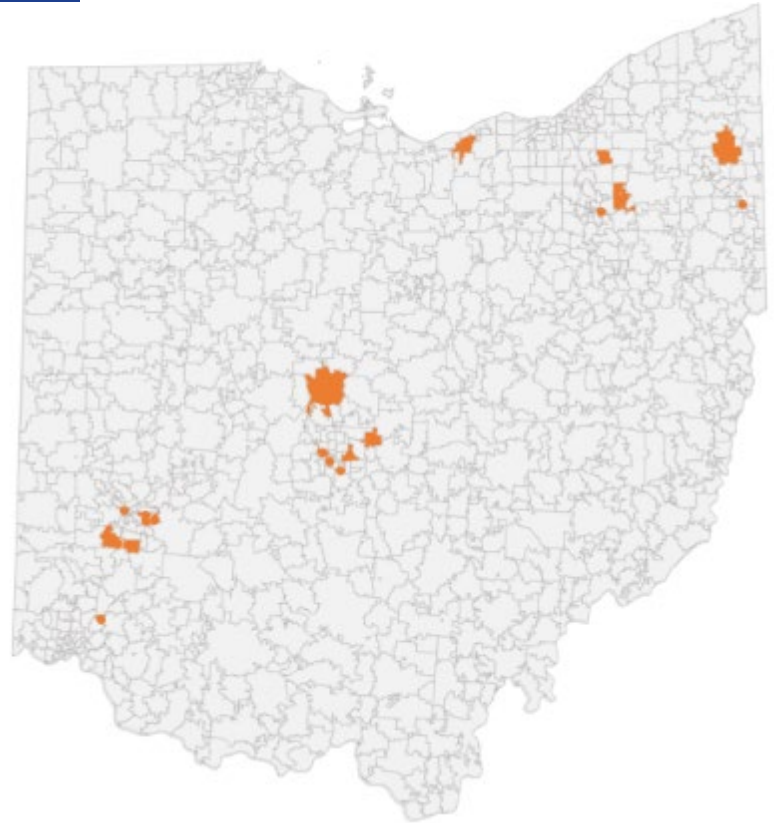
The APEX Journey



APEX's Impact on Ohio

- 23 small businesses awarded 47 USAF SBIR/STTR's
- 9 research institutes partnered on 25 USAF STTR's
- 11 Phase I awards transitioned into a Phase II
- Ohio organizations partnered on projects totaling \$8,517,137

Type of Award with Ohio Partner	Number of Awards
Phase I SBIR	10
Phase II SBIR	4
Phase I STTR	34
Phase II STTR	7
D2P2	2



Consulting Services

- Team of experienced consultants who relay important information and provide proposal feedback (not official guidance)
- Access to regular briefings that focus on proposal pain-points
- 1:1 guidance through the SBIR/STTR proposal process

Matchmaking

- Live database on website that updates in real-time
- Broadcast your organizations information to potential partners
- Ability to search through a database of >115 organizations and request introductions
- OFRN is now listed as an option for partnering interest!



HOME SERVICES ABOUT US RESOURCES EVENTS



Team Matchmaking

APEX MATCHMAKING SERVICE IS NOW YEAR ROUND!!

If you want to pursue an STTR solicitation and need a required partner or you need a subcontractor with particular talents to fill a gap on an SBIR solicitation, or you want to offer your services as a potential partner or subcontractor:

ADVERTISE FOR A PARTNER HERE

SEARCH FOR A PARTNER HERE



Consulting

If you are planning on submitting an SBIR or STTR proposal in the current round and want to join a process navigation consulting cohort to receive advice on how to navigate the proposal process and get invited to select APEX briefings:

22.1/A & ORBITAL PRIME
COHORT PRE-SIGN UP HERE

The Parallax Learning Hub is a **FREE** learning content management system owned by Parallax Advanced Research

Enrollment is free but new users must register at: <https://www.parallaxlearninghub.org/learn>

The MOOC features:

- Self-paced and achronological courses that work with anyone's schedule and can be taken in any order, unless stated otherwise
- Video and web-based content on Department of the Air Force's Small Business Innovation Research and Technology Transfer (SBIR/STTR) programs
- Topics for academic and small business innovators
- General Business Courses
- A Certificate of Completion for users who complete the MOOC's SBIR/STTR courses and tests

The Parallax Learning Hub can be accessed from PC, iOS, and Chrome systems.
Chrome is the suggested browser for desktop.



E-Learning



Suite of Courses



Certificate of Completion

Learning Hub Curriculum

Level One: Getting to Phase I		
Introductory (Overview/Scene-Setter) Module		
SBIR/STTR Intro Modules	Proposal Tips and General Info Modules	
<ol style="list-style-type: none"> 1. Program History 2. Eligibility 3. SBIR vs. STTR (Similarities & Differences) 4. Participating Agencies 5. Web Site Navigation 6. Registration 7. DoD SBIR/STTR 8. USAF Organization 9. Program Structure 10. Getting to Phase I 	<ol style="list-style-type: none"> 1. General Writing Tips 2. Writing a White Paper 3. Writing a 5-page Proposal 4. Writing a Technical Proposal 5. Quad Charts 6. The Heilmeier Catechism 7. Proposal Budgets 	<ol style="list-style-type: none"> 8. Commercialization 9. Common University Agreements 10. University Tech Transfer Offices 11. SBIR/STTR Data Rights 12. Intellectual Property 13. Spin-off Entities 14. Venture Capital
Capstone Knowledge Check (must score 90% to receive Level One Certification)		
Level Two: Phase I thru Phase II		
Introductory (Overview/Scene-Setter) Module		
SBIR/STTR Phase I thru II Modules	General Related Business Modules	
<ol style="list-style-type: none"> 1. Getting Started 2. So Now I Have a Contract 3. Contracts vs. Grants 4. Reporting 5. AF Roles & Responsibilities 6. Phase II Strategy & Proposal 7. Traditional vs. Open 8. Customer Discovery 9. Connecting in the AF 10. Pitch Days 11. Transitioning from Phase I to Phase II 	<ol style="list-style-type: none"> 12. Phase II & II+ Options 13. Funding from Other Sources 14. The MOU 15. Intellectual Property and How to Pitch without Compromising Your IP 16. Partnership Formation 17. External Support Programs Overview 18. Preview of Coming Attractions in Phase III & Beyond 	<ol style="list-style-type: none"> 1. Pitching 101 2. Creating Your Story 1 3. Creating your Story 2 4. High-level Intro for Level 2 5. Slide Prep Tips 6. Pitching Tips 7. Investor vs. Technical Presentations 8. Partnering Opportunities w/Primes I 9. Working with Univ. Tech Transfer II 10. Export Control/ITAR 11. Cyber 12. Finance, Budget, & Accounting Considerations
Capstone Knowledge & Application Check (must pass to receive Level Two Certification)		
Level Three: Phase III & Beyond		
Introductory (Overview/Scene-Setter) Module		
SBIR/STTR Phase III Modules	General Related Business Modules	
<ol style="list-style-type: none"> 1. Getting Started 2. SBIR/STTR Sole Source Benefits 3. Inter-Agency SBIR/STTR Strategy 4. Contracting Opportunities & SBIR/STTR Treatment 5. Contracting Considerations for Phase III 	<ol style="list-style-type: none"> 1. Department of Defense Structure 2. Air Force Structure 3. Defense Acquisition, FAR and DFARS 4. Government Accounting 5. IP & IP Strategy 6. Taking on Equity Investment 7. Venture Pitching 8. Partnering Opportunities w/Primes II 9. Making Your Product Available 10. Heilmeier Catechism Revisited 11. Mission Model Canvas/Lead Business Capstone Module 	
Capstone Curriculum Check (must pass to receive Level Three and Entire Curriculum Certification)		

SBIR/STTR Training Curriculum



25 videos each 3 to 11 min.
Complexity: Introductory
Launched: 1/26/2021

MOOC



31 modules w/various learning modalities
Complexity: Intermediate



17 modules w/various learning modalities
Complexity: Advanced



The Heilmeier Catechism



George H. Heilmeier, Director of ARPA (1975-1977)
Source: IEEE Spectrum June 1997

- What **problem** are you trying to solve?
- What are the **key technical challenges** that prevent that problem from being solved today?
- What is the **new approach** and how can it overcome these technical challenges?
- Why would solving that problem have a **large impact** (to the DoD)?
- What is the **program plan** to solve the problem?

Funding Projects – NAMRU-D

Unique Model:

- Not core funded
- Operating like a small business with their research mission
- Vie for funding through research awards from other government organizations
- Partner with external research to pitch projects/proposals to other government organizations

Connect with NAMRU-D to provide your capability statement



OFRN is a great way to do this

Funding Projects - NASIC

NSPIRES: <https://nspires.nasaprs.com/external/>

Almost all NASIC's external assistance dollars are executed through existing umbrella contracts such as:

- NOVASTAR: Covers requirement across NASIC (Air, Space, Cyber, Missiles, GEOINT, MASIN, SIGINT, HUMINT, OSINT, and TECHINT) (See Attachment L-1 <https://sam.gov/opp/ab07059ff8d44de3b9fe50bc2432107c/view>)
- Comet: Provide Information Technology support services that enable scientific and technical intelligence production and dissemination for the USAF, DoD, and national level intelligence efforts. (See Section L Attachment 9 in the Zip file here <https://sam.gov/opp/3bb444b9593b42d7ab60a095151039d8/view>)

NASIC's research dollars are focused more on advanced technology and prototype development (6.3 and 6.4) rather than basic or applied research (6.1, 6.2).

- This usually means you need to have a good idea what they are currently working on and where the shortfalls may be in order to offer a workable solution for research dollars.
- With the classified nature of most of NASIC's work, knowing what they are working on and their current needs is difficult. Even contractors who are team members on the contracts named above have trouble getting an idea of what is needed if they don't have a physical presence inside the building.

Connect with the Prime Contractor to provide your capability statement

(U) National Intelligence Community



- 17 Agencies and Organizations
- \$85B budget request for FY21
 - \$62B National Intelligence Program
 - \$23B Military Intelligence Program

You are
here



- 4,000 + Airmen
- \$350M + Budget

(U) NASIC Mission



Discover and characterize air, space, missiles, and cyber threats to enable full-spectrum, multi-domain operations, drive weapon system acquisition, and inform national defense policy.



OBSERVE:

"WATCH" THEIR
ACTIVITY

ESTIMATE IMPACT
OF ACTIVITY

ASSESS:

ESTIMATE IMPACT
ON CAPABILITIES

MODEL:

REPLICATE THEIR
CAPABILITIES

PREDICT:

ANTICIPATE THEIR
ACTIONS

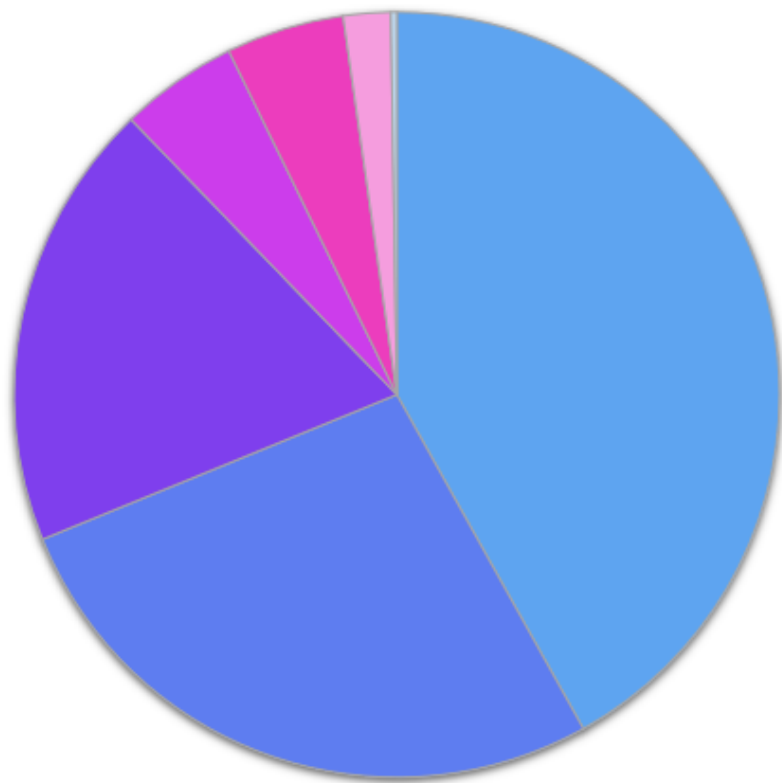
(U) NASIC Organizational Structure



- **4 Analytic Groups**
 - **Air and Cyberspace**
 - **Geospatial and Signatures**
 - **Global Exploitation**
 - **Space, Missiles and Forces**

- **4 Support Directorates**
 - **Communications and Information**
 - **Human Resources**
 - **Logistics**
 - **Plans and Operations**

NASIC Workforce



	Percent	Personnel
■ Civilians	42%	1,699
■ Contractors	27%	1,114
■ Active Duty Military	19%	789
■ Ohio National Guard	5%	195
■ Classic Associated Units	5%	175
■ IMA Reservists	2%	84
■ Students/Interns	0.25%	10

NASIC Mission Support Contract Vision



	Intel Production	Capability R&D	A&AS	Enterprise IT
FY17-21	<ul style="list-style-type: none">• ATEP II (AF)• Multiple GSA• MEGASTAR (GSA)• IMD II (GSA)	<ul style="list-style-type: none">• ATEP II (AF)• AVIPSS (AFRL)• Multiple GSA• MEGASTAR (GSA)• IMD II (GSA)	<ul style="list-style-type: none">• A&AS II (GSA)• LG/Facility Support (GSA)	<ul style="list-style-type: none">• N-ITSS (AF)• RHEL IT (AF)• MASINT IT (AF)
FY22-31	<ul style="list-style-type: none">• <i>MEGASTAR (GSA)</i>• <i>IMD II (GSA)</i>• NOVASTAR (AF)	<ul style="list-style-type: none">• <i>MEGASTAR (GSA)</i>• <i>IMD II (GSA)</i>• NOVASTAR (AF)	<ul style="list-style-type: none">• A&AS III (GSA)• LG/Facility Support (GSA)	<ul style="list-style-type: none">• COMET IDIQ (AF)



Department of Defense (DoD) Manufacturing Technology Enterprise Organizational Chart



DoD Manufacturing Technology Program

Joint Defense Manufacturing Technology Panel (JDMTP)



The JDMTP reports on manufacturing technology issues of multi-service concern and application to, and receives direction from the OSD Manufacturing Technology Office

JDMTP Subpanels

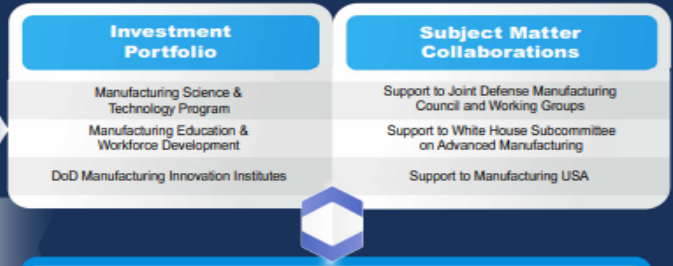


JDMTP Working Groups



OSD Manufacturing Technology Office

Director: Tracy Frost



DoD Manufacturing Innovation Institutes

