Agenda

- **9:00 - 9:10 am** - OFRN Overview by Mark Bartman, Maj Gen (Ret.), VP for Advanced Development, Parallax Advanced Research

- **9:10 - 9:40 am** - Alexis Bonnell, Chief Information Officer and Director of the Digital Capabilities Directorate of the Air Force Research Laboratory (AFRL)

- **9:40 - 10:10 am** - Bob Dirgo, Senior Program Manager at the Ohio Aerospace Institute (OAI) and lead of the DRIVE Consortium

- **10:10 - 10:25 am** - Opportunity Review, Steven Price, OFRN Associate

- **10:25 - 10:30 am** - Wrap-up

- **Emcee:** Mark Bartman, Maj Gen (Ret.), VP for Advanced Development, Parallax Advanced Research

- **Parallax Team:**
  - Emma Zardo
  - Becky Mescher
  - Jess Pacheco
  - Sophia Cipriani

- **Event Speakers:**
  - Alexis Bonnell, Chief Information Officer and Director of the Digital Capabilities Directorate of the Air Force Research Laboratory (AFRL)
  - Bob Dirgo, Senior Program Manager at the Ohio Aerospace Institute (OAI) and lead of the DRIVE Consortium

- **Opportunity Review:**
  - Steven Price, OFRN Associate

- **Government partners:** AFRL, NAMRU-D, NASA-GRC, NASIC, Ohio National Guard

OFRN Construct

NASA Glenn Research Ctr (GRC) Priorities

Air Force Research Lab (AFRL) Priorities

National Air & Space Intelligence Ctr (NASIC) Priorities

State of Ohio

Industry Needs

PARALLAX & The Ohio State University

Naval Medical Research Unit (NAMRU) Priorities

Ohio National Guard Priorities

Executive Review Board

Technical Review Council

OFRN Goals

Triple Helix Model of Innovation, Hybrid / Boundary Organizations
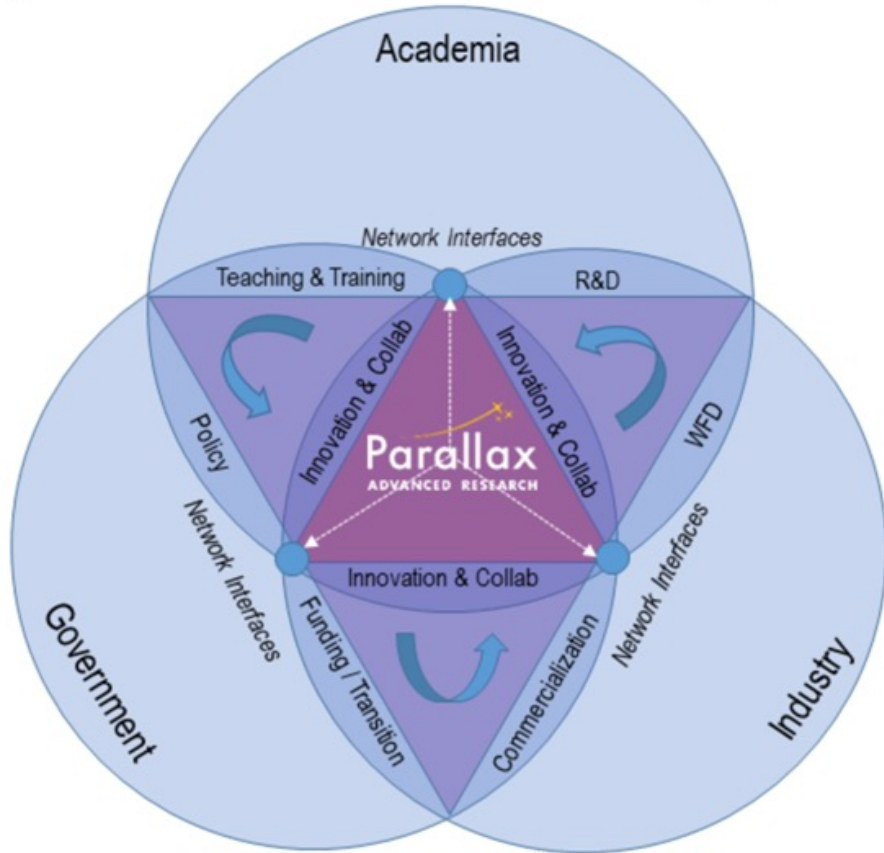
- Increase the amount of Federal Funding that flows to Ohio

- Support the types of Federal projects on which Ohio's federal partners are focused

- Increase the extent to which OFRN produces enhanced collaboration among institutions/industry

- Develop lasting and sustainable knowledge that allows academic institutions/industry to improve their ability to compete for federal resources over time

OFRN Program Impact – to date

21 Universities & colleges engaged

4+1 Government Partners

97 Business partners engaged

1,100+ Indirect jobs created

359 Direct jobs created

13 Spin out companies created

$51.4M State of Ohio Investment - ODHE

$359+M Follow-on Funding Awarded

$39M Cost Share

Funding Round Terms Key

R1 - The OFRN Centers of Excellence Round 1 projects
R2 - The OFRN Centers of Excellence Round 2 projects
R3 - The OFRN SOARING Initiative Round 3 projects
R4 - The OFRN SOARING Initiative Round 4 projects
R5 - The OFRN SOARING Initiative Round 5 projects

CONTROL

R1 – Ohio State University
"Intelligent Control Architecture"
R2 – Ohio State University
"Effects of Motion Sickness on Military Health"

R2 – Wright State University
"Automated Test, Evaluation, Verification and Validation Tools"
R3 – Persistent Surveillance Systems
"Automated Cirrus SR22 for Surveillance or Personnel Transport"
R4 – Asymmetric Technologies
"IronClad Secure Flight Controller"

STRUCTURAL

R1 – University of Toledo
"Adaptive Bio-Inspired Aerospace Structures Actuated by Shape Memory Alloys"
R1 – University of Akron
"High Performance Plastic Substrates for Flexible Electronics"
R2 – University of Dayton Research Institute
"Cost Effective 3D Printed Complex Geometry Composites"
R2 – The Ohio State University
"Carbon Nanotube Electro-Thermal Ice Protection System for UAVs"

POWER

R1 – Case Western Reserve University
"Multifunctional Structural Battery"
R1 – University of Akron
"High Density Li-Ion Battery with Silicon Anodes"
R1 - University of Dayton Research Institute
"High-Energy Long-Life Li-S Battery"
R4 – Kent State University
"A Hybrid Fuel Cell – Battery/Capacitor Power Source for UASs"

R5 - Safran Power USA, LLC
"Advanced High Voltage DC Generator System for Aerospace with Rapid Dynamic Response"

R5 - Miami University
"High Reliability, Low EMI, Wide Bandgap Power Conversion for Air & Space Applications"

SENSORS & AWARENESS

R3 – GhostWave
"Optical-Radar Sensor Fusion for UAV Onboard Detect and Avoid"
R4 – Youngstown Business Incubator
"Geometrically Complex 3D Printed Sensors"
R5 - The Ohio State University
"Affordable LIDAR Technologies for Integration and Unmanned Deployment (ALTITUDE)"

R5 - Asymmetric Technologies, LLC
"Autonomous Capabilities for CASEVAC and Resupply in UrbanEnvironments (ACCRUE)"

PROPULSION

R1- Case Western Reserve University
"High Temperature Magnetic Materials"
R1 – Ohio State University
"Hybrid Turbo-Electric Propulsion"
R2 – Ohio State University
"Advanced Turbine Cooling"
R3 – Ohio State University
"Super Conducting Brushless Motors"

COMMUNICATION

R2 – Wright State University
"C2PNT Intelligent Channel Sensing"

COMMAND & CONTROL

R1 – Wright State University
"Augmented UAV Operator Human Machine Interface (HMI)"
R2 – University of Cincinnati
"Advanced Cognitive and Physical Sweat Biosensing for Operators"
R4 – CAL Analytics
"Interoperability in the Modern UAS Traffic Management Architectures"
R4 – Riverside Research
"Computer-Human Interaction for Rapid Program Analysis through Cognitive Collaboration"

AEROSPACE AWARENESS

R2 – Wright State University
"Human-Centered Big Data Trustworthiness"
R3 – University of Cincinnati
"RouteMaster – A Collision Avoidance and Traffic Management Digital Infrastructure"
R4 – GhostWave
"Integrated Optical-Radar Sensor Fusion System for Air Space Awareness"
R6 – Flightprofiler
"Low Altitude Weather Network (LAWN)"

PLANNING

R1 – Wright State University
"Regional UAV Live-Virtual-Constructive Enterprise"

OFRN: Rounds 1-5 Funded Projects
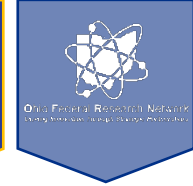
https://www.ohiofrn.org/ohio-federal-research-network-rd-projects

OFRN: Round 6 Areas of Interest

Areas Of Interest	Topics
Hypersonics	- Additive manufacturing of structures with gradient thermal properties - High temperature joining techniques with "warm" or "cold" adjacent structures
Human Performance	- Physiological and environment monitoring for ocular health and human performance - XR telemedicine / patient care in austere/isolated environments
High Power Energy	- Affordable DC emulation and digital engineering - B-Ga203 substrate development - High voltage to low voltage DC energy conversion
Digital Engineering Tools	- Techniques to convert between model fidelity levers or utilization of multifunctioning models - Methods (low cost) model validation and assessment of digital maturity models
Commercial Space Research - LEO	- Materials joining automation in LEO - In-orbit biomanufacturing and repurposing of space-based materials
Quantum Technologies	- Quantum sensing: e.g., magnetic, electric field and photonics - Integration of at least two sensors

Upcoming Events

➢ **Launch Dayton Startup Week –** in-person @ The Hub in Downtown Dayton, September 12-15

➢ **DDC - National Advanced Air Mobility Industry Forum** – in-person @ Springfield-Beckley Airport, September 18-19

➢ **2023 DDC Ohio Defense & Aerospace Forum –** in-person @ Wright State University, October 2-3

➢ **2023 DBJ Aerospace & Defense Forum –** in-person, October 2

AFRL Is MADE to Accelerate!
The Blueprint for AFRL's Digital Transformation

Presenter: Ms. Alexis Bonnell, Chief Information Officer and Director of the Digital Capabilities Directorate of the Air Force Research Laboratory (AFRL)
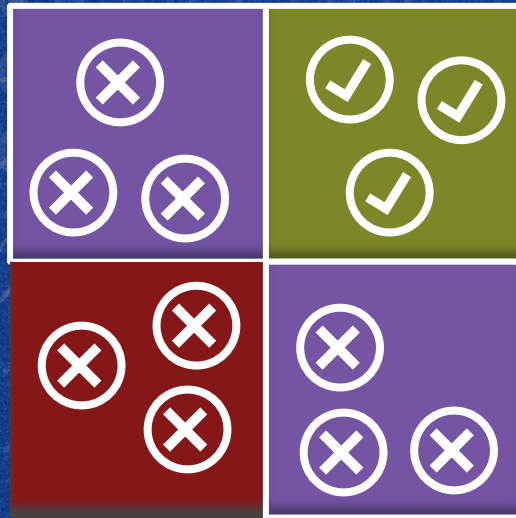
The Impact of Digital Transformation

AFRL

DELIVER NEW CAPABILITY TO THE WARFIGHTER AT THE SPEED OF RELEVANCE

DIGITAL
CAPABILITIES DIRECTORATE

Military Utility

Cost Effectiveness

To accelerate the implementation of the Air Force S&T 2030 Strategy, we must:

- Focus on fewer technologies that show the highest payoff in terms of military utility and cost effectiveness through rigorous analysis; and

- Continue to improve the efficiency of resource management

Digital Transformation - including Digital Engineering - facilitates
rapid innovation, iteration, and fielding of new warfighter capabilities
via the coevolution of technology-enabled operational and system concepts

Sharing?

Non-value-added work

Complexity?

Speed/Power?

Friction

Resources

Accessibility?

"The Valley of Death"

Data

Accuracy?

Culture problems

Expensive business processes

Utility

Limited connectivity to global partners

Standards?

Over reliance on physical transport

Lack of corporate modeling and analysis

Network limitations?

Lack availability of tools

Applications

Isolated equipment and networks

Architecture

Legacy/shadow IT?

Approvals required

Infrastructure

Availability of Services?

Disjointed SW networks

Cybersecurity required

Scientist, Engineer, Manager, Specialist

AFRL Digital Transformation Challenge

Digital initiatives disconnected and poorly aligned to enterprise strategy and not focused on customer experiences

AFRL Digital Transformation Strategy

AFRL — DIGITAL CAPABILITIES DIRECTORATE

AFRL Digital Transformation Vision

AFRL MADE to Accelerate:
Model, **A**nalyze, **D**ecide, **E**xecute

AFRL Digital Transformation Mission

Measurably accelerate the generation and transition of adoption-ready technology with demonstrable military benefit

AFRL Digital Transformation Goals

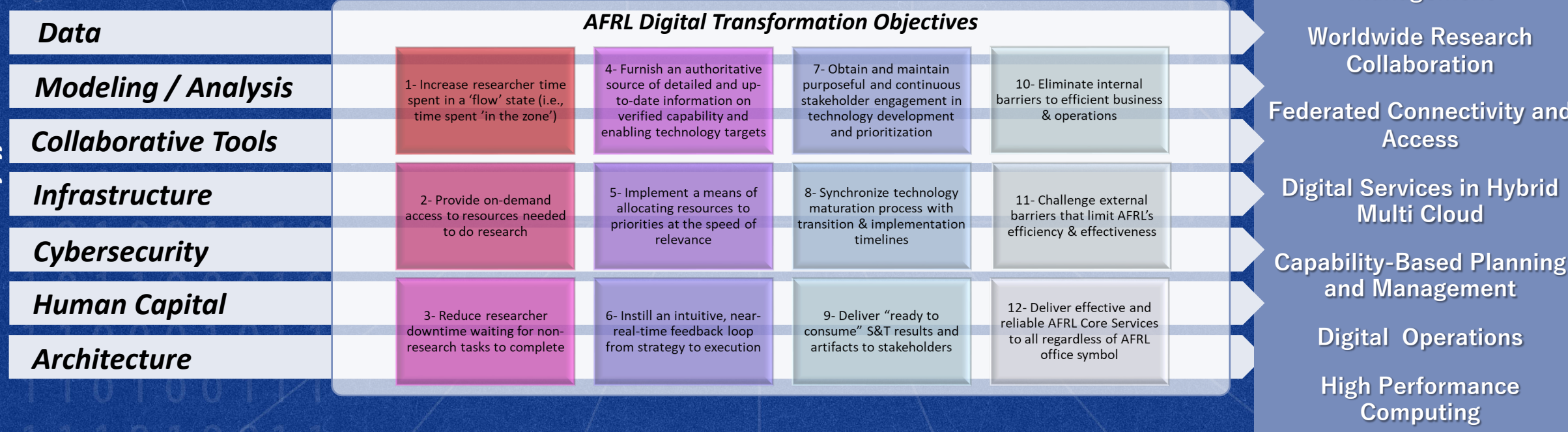| FASTER RESEARCH: Accelerated Research, Experimentation, and Innovation	BETTER DECISIONS: Analytically Rigorous Technical, Business, and Operations Decisions	STREAMLINED TRANSITIONS: Seamless Entrance into Acquisition	LOW-FRICTION BUSINESS & OPS: Flexible and Responsive Business & Ops

AFRL Digital Foundational Capabilities

- Data Lifecycle Management
- Worldwide Research Collaboration
- Federated Connectivity and Access
- Digital Services in Hybrid Multi Cloud
- Capability-Based Planning and Management
- Digital Operations
- High Performance Computing

AFRL Digital Transformation Lines of Effort

- Data
- Modeling / Analysis
- Collaborative Tools
- Infrastructure
- Cybersecurity
- Human Capital
- Architecture

AFRL Digital Transformation Objectives

1- Increase researcher time spent in a 'flow' state (i.e., time spent 'in the zone')	4- Furnish an authoritative source of detailed and up-to-date information on verified capability and enabling technology targets	7- Obtain and maintain purposeful and continuous stakeholder engagement in technology development and prioritization	10- Eliminate internal barriers to efficient business & operations
2- Provide on-demand access to resources needed to do research	5- Implement a means of allocating resources to priorities at the speed of relevance	8- Synchronize technology maturation process with transition & implementation timelines	11- Challenge external barriers that limit AFRL's efficiency & effectiveness
3- Reduce researcher downtime waiting for non-research tasks to complete	6- Instill an intuitive, near-real-time feedback loop from strategy to execution	9- Deliver "ready to consume" S&T results and artifacts to stakeholders	12- Deliver effective and reliable AFRL Core Services to all regardless of AFRL office symbol

AFRL Digital Capabilities Directorate Alignment to AFMC Digital Materiel Management

2023 STRATEGIC PLAN

→ **AFRL Digital Transformation Strategy**

DIGITAL TRANSFORMATION STRATEGY 2022-2030

Goals

| FASTER RESEARCH | BETTER DECISIONS | STREAMLINED TRANSITIONS | LOW-FRICTION BUSINESS & OPS |

"Accelerate S&T"

Lines of Effort | Foundational Capabilities

AFMC Strategic Plan

- Deliver Integrated Capabilities
- Strengthen Our Team
- Revolutionize Our Processes
- Amplify Warfighting Culture

AFMC LOE3, Objective 2: Employ Digital Material Mgmt

	Data	Modeling and Analysis	Collaborative Tools	Infrastructure	Cybersecurity	Human Capital	Architecture	AFRL Data Marketplace	Cross Domain Solutions and Multi Level Security Worldwide	Collaboration Environments	Digital Services for Hybrid Multi Cloud IT	Capability Based Investment Planning
A. Structure and secure our data	✓				✓			✓		✓	✓	
B. Train our digital workforce						✓						
C. Provide access to DMM tools		✓	✓							✓	✓	
D. Develop digital strategies		✓					✓					✓
E. Modernize IT infrastructure				✓					✓		✓	
F. Instill a digital-first culture						✓				✓		✓

Questions?

Ohio Aerospace Institute

- OAI is a private, nonprofit 501(c)(3) founded in 1989 with initial financial support from Ohio Board of Regents and partnership with NASA and the Air Force

- _First_ NASA-associated collaborative Institute chartered to foster relationships between universities, aerospace industries, and government organizations—more than 300 Federal contract awards worth over $300M across NASA, DoD, DoE, and DoC

- Strong partnerships across Government/Academia/Industry:
    - Ohio federal labs
    - State of Ohio
    - JobsOhio
    - Ohio universities, including all 11 PhD granting engineering schools
    - International aerospace industry and regional manufacturing organizations

- OAI formed a joint affiliation agreement with the private, nonprofit 501(c)3 Parallax Advanced Research on January 1, 2023

OHIO AEROSPACE INSTITUTE

wholly affiliated with
Parallax Advanced Research

Core Capabilities—30+ years of Experience

Building and managing international collaborations, consortia and public-private partnerships

- Neutral, unbiased management with models to establish collaboration where traditionally competition exists
- Opportunities for international collaboration and supply-chain enhancement, including small business assistance
- Experience in technology-based economic development, intellectual property management and commercialization
- Host events for the benefit of members to connect, share, and succeed

Purpose & Objectives

- Purpose - To create a best-in class collaborative, innovative eco-system comprised of a diverse group of industry and academic entities with the capabilities and ingenuity needed to partner with the Air Force to realize its critical and necessary goal of the digital transformation across its entire value stream.

- Objectives – Near Term

  1) To enroll enough new members into the DRIVE Consortium with the capabilities needed to meet the near-term project goals of the Air Force

  2) Launch RFP's for identified funded projects needed by the Air Force to advance digital transformation

- Objectives - Long Term

  1) Draw upon the Consortium members for input into identifying future projects in a marriage of Top-Down and Bottoms-Up engagement for project call identification

  2) Foster an innovative, collaborative eco-system amongst the DRIVE Consortium Members such that collaborative working groups emerge to tackle some of the larger transformational needs of the Air Force.

Benefits of Membership

- Future DRIVE project calls will be released to the DRIVE Consortium members for proposals.

- Air Force digital transformation is a broad scope. Member companies will have the unique opportunity to collaborate on topics in digital transformation.

- Member companies will have the opportunity to market their digital capabilities to the Air Force and other Consortium members.

- The DRIVE Consortium will become a recognized source for state-of-the-art digitization capabilities and sought after for government sector digitization needs beyond the Air Force (i.e., other DoD branches, NASA, NIST, etc.).

Governance Council
- Consortium Oversight and Direction
- Strategy
- Advocacy
- Project Authorization

MEMBERS

Traditional & Non-Traditional Defense Contractors

Small Businesses

Academia

Non-Profits

Strategic Input

Technical Direction

$ (Admin. Funding, Cost Share)

Administrator
- Fiscal, legal agent
- Administrative & Contract Mgmt.
- Proposal Competition
- Consortium Facilitator
- IP Management

Mission Working Groups
(examples)
- Digitization of the 5 PLM stages
  - Development
  - Introduction
  - Growth
  - Maturity
  - Decline
- Working Group Objectives
  - Define program goals
  - Develop technology roadmap
  - Assist in project selection
  - Monitor project execution

$ Program

- Represents Government technology & program interests
- Define Mission Project Needs
- Provide programmatic and technical guidance / advocacy
- Project Selection
- Coordinate external program support
- Approve Project Funding

$ (Contracts, Grants)

Project Teams
- Prepare proposals in response to relevant RFP opportunities
- Cost share commitment (as required)
- Execute funded projects

OAI Proprietary Information – For evaluation purposes only

Membership Application Process

- Companies complete a Membership Application located on the DRIVE website to be considered as a member of the Consortium - www.driveconsortium.org

- A proprietary information agreement is executed in order to enable an evaluation of the DRIVE Consortium Membership Agreement

- Company reviews the terms of the Consortium Membership Agreement and if agreeable executes the Agreement and pays the initial annual fee of $750
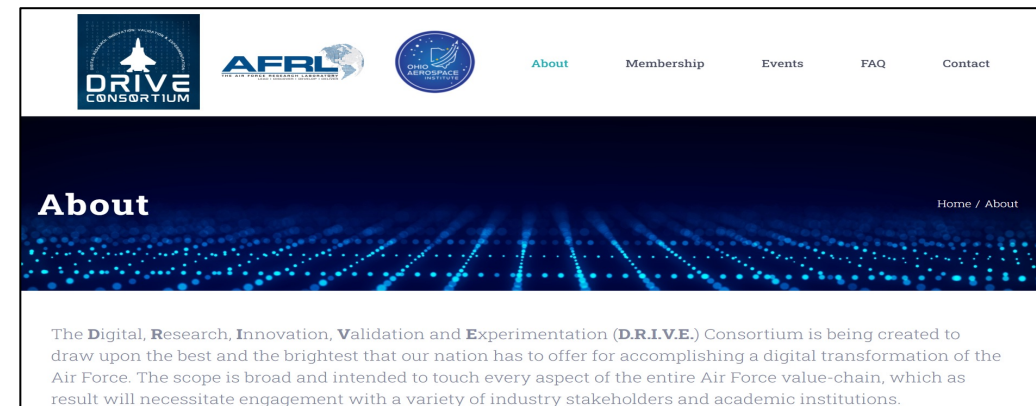
DRIVE Consortium current make-up

- There are 49 members within the consortium as of 8\11\23 and another 21 in the application process to join.

- The current make-up of members is diverse consisting of some of the major defense OEM's such as Raytheon, Northrup Grumman, etc. to one person companies.

- There are software companies like Microsoft and Ansys, consulting companies, institutes and universities.

- So, the Air Force desired diverse, innovative eco-system is already a pre-dominant characteristic of the Consortium.

- It continues to grow at a steady pace and all entities that can contribute to Air Force digital transformation are encouraged to consider joining.

RFP #1 – Manufacturing at Speed – June 2023

- Operations
  - Demonstrate integration of digital tools and techniques to affect a >50% reduction in span time from requirement to product
  - Approx $5M
- Supply Chain
  - Demonstrate integration of data and tools into supply chain to affect span time reductions
  - Approx $8M

Next Steps

- Announce awardees for RFP #1 and initiate associated projects

- Launch a collaborative virtual workspace to foster collaboration, and teaming amongst DRIVE Consortium Members

- Initiate a series of virtual information sharing sessions between Air Force Stakeholders and Consortium Members to communicate needs and opportunities and increase awareness of capability within the consortium eco-system.

- Release additional RFP's to contribute to the digital transformation objective of the Air Force.

Questions?

Opportunity Review

AFRL Rocket Lab Hermes

Solicitation #: FA9300-20-S-0001

- **Who**
  - *Gov't*: AFRL
  - *Eligibility*: U.S. entities
- **What**
  - BAA
- **When**
  - *Release*: 18 March 2020
  - *Due*: 18 March 2027

- **Where**
  - sam.gov/opp/5224c4683d66452289704b0ffe3f4877/view
  - Primary POC: Lisa Davis, lisa.davis.6@us.af.mil
  - Secondary POC: Alvaro Guzman, alvaro.guzman.1@us.af.mil
- **Why**
  - *Funding*
    - Multiple awards, varying contract duration/value
    - No pre-defined min/max per award (anticipated not to exceed $100M/award)
  - *Technical*
    - Address any topics defined within three areas:
      - Solid rocket motors
      - Liquid rocket engines
      - Air-breathing turbine engines

Robust and Efficient Computing Architectures, Algorithms and Applications for Embedded Deep Learning

Solicitation #: FA8750-19-S-7007

- **Who**
  - *Gov't*: AFRL
  - *Eligibility*: U.S. entities

- **What**
  - BAA

- **When**
  - *Release*: 18 April 2019
  - *Due*: 30 September 2023

- **Where**
  - sam.gov/opp/7bfda53837f2403292b56155ac05db6d/view
  - BAA POC: Albert Frantz, albert.frantz@us.af.mil
  - Contracting POC: Amber Buckley, amber.buckley@us.af.mil

- **Why**
  - *Funding*
    - $99M total program funding
    - Between $1M – $3M/award, 3 years

  - *Technical*
    - Develop advanced computing architectures for AI and ML use in an embedded computing environment
    - Priority given to submissions that optimize size, weight, and power (SWaP)

Advancing Computing Technology and Applications

Solicitation #: FA8750-19-S-7010

- **Who**
  - *Gov't*: AFRL
  - *Eligibility*: U.S. entities

- **What**
  - BAA

- **When**
  - *Release*: 23 May 2019
  - *Due*: 29 September 2024

- **Where**
  - sam.gov/opp/29f5f6ceb76f4704b89928f8ba7f71c8/view
  - BAA POC: Courtney Raymond, courtney.raymond.1@us.af.mil
  - Contracting POC: Amber Buckley, amber.buckley@us.af.mil

- **Why**
  - *Funding*
    - $99.9M total program funding
    - Between $1M – $5M/award, 3 years
  - *Technical*
    - Develop computing architectures/applications that address:
      - Embedded and tactical high-performance computing
      - Neuromorphic computing and ML applications
      - Nanocomputing
    - Priority given to submissions that optimize SWaP

Advancing Systems of Systems Technologies for Rapid Adoption (ASTRA)

Solicitation #: FA8750-23-S-7007

- **Who**
  - *Gov't*: AFRL
  - *Eligibility*: U.S. entities

- **What**
  - ARA

- **When**
  - *Release*: 26 July 2023
  - *Due*: 24 July 2028 (rolling submissions)
    - FY24: 27 October 2023
    - FY25: 16 September 2024

- **Where**
  - sam.gov/opp/e76d2e7f4ade4ec58b7a5c1656f444a3/view
  - ARA POC: Gerard Wohlrab, gerard.wohlrab@us.af.mil
  - Contracting POC: Amber Buckley, amber.buckley@us.af.mil

- **Why**
  - *Funding*
    - $200M total program funding
    - Between $1M – $25M/award, not exceeding 5 years
  - *Technical*
    - Conduct innovative research to enable rapid integration of SoS and auto-generation of tests of SoS Technology Integration Tool Chain for Heterogeneous Electronic Systems (STITCHES)
    - Focus areas:
      - STITCHES tools and technologies
      - DevOps gov't cloud-based platforms

Artificial Intelligence Cyber Challenge (AIxCC)

Solicitation #: HR0011SB20234-17

- **Who**
  - *Gov't*: DARPA
  - *Eligibility*: U.S. entities

- **What**
  - BAA
  - D2P2 solicitation

- **When**
  - *Release*: 17 August 2023
  - *Due*: 19 September 2023

- **Where**
  - darpa.mil/work-with-us/for-small-businesses/HR0011SB20234-17
  - Support: SBIR_BAA@darpa.mil

- **Why**
  - *Funding*
    - TBD

  - *Technical*
    - Leverage advancements in AI and ML (such as LLMs) to semi-automatically find and fix software vulnerabilities
    - Phase II will include test and evaluation where system must demonstrate efficacy against AVD&R challenges

FY24 DoD Multidisciplinary Research Program of the University Research Initiative (MURI)

Funding Opportunity #: FOA-AFRL-AFOSR-2023-0004

- **Who**
  - *Gov't*: AFOSR
  - *Eligibility*: Science & engineering degree-granting IHEs

- **What**
  - Research grant

- **When**
  - *Release*: 22 February 2023
  - *Due*: 8 September 2023

- **Where**
  - grants.gov/view-opportunity.html?oppId=346285
  - Program coordinator: Katie Wisecarver, katie.wisecarver@us.af.mil

- **Why**
  - *Funding*
    - $276M total program funding
    - Between $1M – $7.5M/award, typically 3-year period
  - *Technical*
    - Conduct research addressing one of many topics
      - Math paradigms for integrating data, models, decisions
      - Modeling and measuring multilevel resonance
      - 7 additional topics
    - Opportunity to address ONR and ARO topics as well

Process Systems, Reaction Engineering, and Molecular Thermodynamics

Funding Opportunity #: PD-23-1403

- **Who**
  - *Gov't*: NSF
  - *Eligibility*: Unrestricted

- **What**
  - Research grant

- **When**
  - *Release*: 18 June 2023
  - *Due*: Proposals accepted anytime

- **Where**
  - grants.gov/view-opportunity.html?oppId=348793
  - Primary POC: Raymond Adomaitis, radomait@nsf.gov
  - Secondary POC: Catherine Walker, cawalker@nsf.gov

- **Why**
  - *Funding*
    - $4.9M total program funding
  - *Technical*
    - Proposals to focus on:
      - Chemical reaction engineering
      - Process design, optimization, and control
      - Reactive polymer processing
      - Molecular thermodynamics

Active DoD BAAs

dodsbirsttr.mil

Helpful Links

1. SAM.gov – Contract opportunities

2. GRANTS.gov – Federal funding opportunities

3. SBIR.gov – SBIR/STTR information and solicitations

4. defensesbirsttr.mil – DoD-specific solicitation information

5. dodsbirsttr.mil – DoD-specific solicitations

6. sbir.nasa.gov – NASA-specific solicitations

7. ohiofrn.org – Help with identifying opportunities, matchmaking, and proposal development

8. apex-innovates.org – Help with SBIR/STTR process navigation and matchmaking