OHIO FEDERAL RESEARCH NETWORK

IMPACT REPORT **2026**



TO THE OHIO DEPARTMENT OF HIGHER EDUCATION

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Impact Summary

Managed by Parallax Advanced Research in collaboration with The Ohio State University and funded by the Ohio Department of Higher Education, the Ohio Federal Research Network stimulates Ohio's innovation economy by building vibrant, statewide university–industry research teams that meet the needs of Ohio's five federal partners—Air Force Research Laboratory (AFRL), National Air and Space Intelligence Center (NASIC), National Aeronautics and Space Administration – Glenn Research Center (NASA-GRC), Naval Medical Research Unit Dayton (NAMRU-D), and the Ohio National Guard (ONG).

OFRN's impact is well-documented and measurable. Since 2015, including Rounds 1-7, the program has transformed $72 million in State of Ohio investment into more than $436 million in follow-on funding, along with $43 million in cost-share, a six to one return on investment. Additionally, the OFRN has incubated 17 commercial spinouts, administered 48 funded R&D projects, and resulted in 14 intellectual property outcomes (12 issued and 2 pending). The statewide network now includes 116 industry partners and 25 academic institutions, forming one of the strongest applied research ecosystems in the country. These achievements reflect OFRN's effectiveness in generating high-value technologies, strengthening federal partnerships, and increasing the share of research dollars flowing into Ohio.

History

Fueling Technology Development in Ohio for National Priorities

Establishment of the Ohio Federal Research Network (OFRN) was a key recommendation from the Ohio Federal Military Jobs Commission in 2015. The Ohio General Assembly, through the Ohio Department of Higher Education, funded OFRN to create a collaborative research hub designed to expand Ohio's cutting-edge research capability and create new economic opportunities for Ohio.



Figure 1: OFRN Goals

Figure 1 highlights the key goals of the OFRN, each of which integrates the broader objectives originally established by the Ohio Federal Military Jobs Commission. These goals include:

1. **Increase the amount of federal funding that flows to Ohio**
   This goal incorporates OFRN's mission to leverage state investment, capitalize on federal and university research assets, and prepare universities and companies to compete more effectively for federal opportunities. By building stronger proposal teams and aligning work with mission needs, OFRN increases Ohio's share of Department of Defense (DoD), NASA, and other federal R&D funding.
2. **Support federal missions and priority technologies**
   OFRN is designed to align Ohio research teams with the operational needs of federal partners, ensuring that state-funded projects directly support the missions of AFRL, NASIC, NASA GRC, NAMRU-D, and the Ohio National Guard. This also reflects OFRN's role in differentiating Ohio nationally as a state deeply committed to advancing defense and civil space missions.
3. **Increase collaboration among universities, industry, and federal labs**
   This goal incorporates OFRN's charge to integrate Ohio firms and industrial partners into R&D, strengthen cross-sector teaming, and ensure broad statewide participation. These collaborations build the sustainable networks needed for long-term competitiveness and encourage early technology transition pathways.

4. **Build long-term institutional and industry capability to compete and commercialize**

   This integrates developing lasting knowledge and capability across academia and industry, facilitating the transition of government-funded technologies to commercial markets, and creating the jobs, companies, and supply chains that will power Ohio's future economy.

Together, these goals ensure OFRN creates not only successful projects today but also the durable innovation capacity required for Ohio to lead in aerospace, defense, energy, and next-generation technologies.

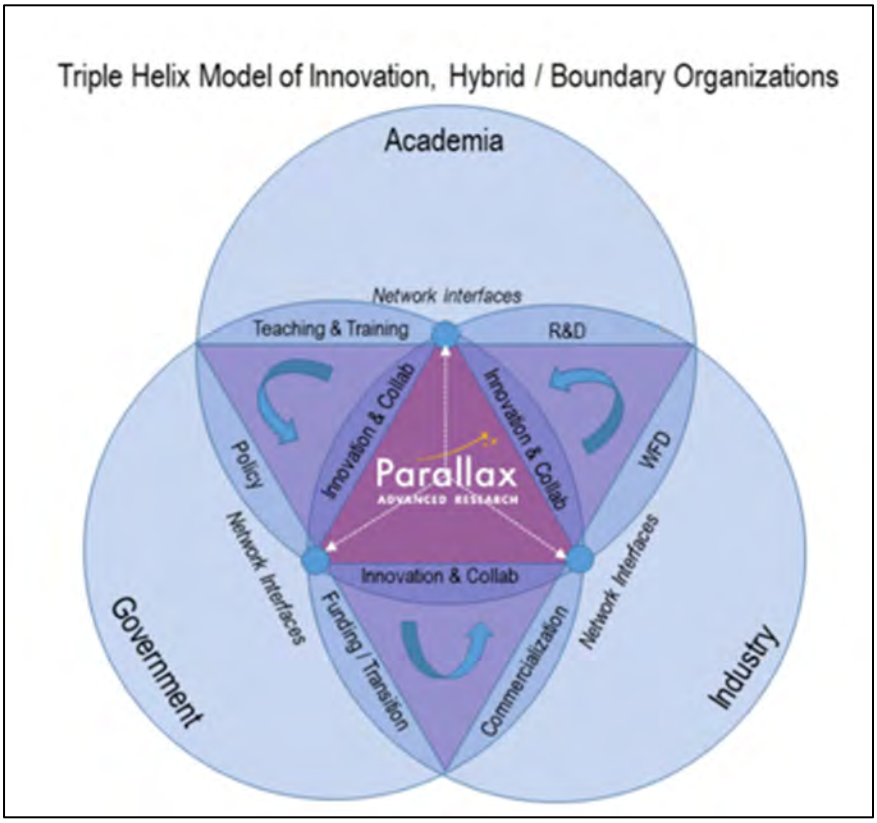


Figure 2: Triple Helix Model of Innovation

To achieve the mission, OFRN catalyzes federal, academic, and commercial collaborations to support the future growth of Ohio's workforce, with a focus on the priority research initiatives of Ohio-based federal and state partners (Figure 2). Since its inception, OFRN has been a forward-looking investment in Ohio's aerospace and defense future. Rather than responding solely to existing federal research needs, OFRN anticipates where the Department of War and NASA are heading and synergizes the research at Ohio's universities, industry partners, and research institutions to meet those emerging missions. This strategic posture positions Ohio early in areas now nationally recognized as critical: hypersonics, digital engineering, human performance, advanced materials, quantum technologies, autonomous systems, and low-Earth orbit commercialization.

OFRN's Influence on Emerging State and Federal Partnership Programs

OFRN has become a statewide model for innovation, collaboration and integration, demonstrating how coordinated investment, university–industry teaming, and alignment with federal missions can accelerate technology transition. Its integrated approach has directly shaped several major R&D and workforce development initiatives across Ohio.

OFRN's collaborative framework influenced the design of three major programs:

1. **Academic Partnership Engagement Experiment (APEX)**

   Built on OFRN's principles, APEX created a national network connecting universities and small businesses with the Air Force and Space Force. It adopted OFRN's model of coordinated academic engagement, federal alignment, and streamlined pathways into SBIR/STTR programs.

2. **Defense Innovation OnRamp Hub: Ohio**

   The OnRamp Hub: Ohio program leveraged OFRN's approach to cross-sector teaming, rapid matchmaking, and transition support to build a statewide defense supplier pipeline. Lessons from OFRN's R&D proposals—particularly those focused on manufacturing innovation and supply-chain

readiness—helped shape the OnRamp Hub: Ohio's dual-use readiness, technical maturation, and defense-commercial transition model.

3. **National Advanced Air Mobility Center of Excellence (NAAMCE)**

   NAAMCE at Springfield–Beckley Airport grew from foundational OFRN investments in UAS, autonomy, digital engineering, and weather systems. OFRN-funded research, such as the eVTOL/UAS weather sensor network (Round 6), provided early technical infrastructure and credibility that helped secure federal, industry, and state support for Ohio's leadership in Advanced Air Mobility (AAM).

OFRN's success helped guide state and regional initiatives focused on expanding the research-to-commercialization pipeline, increasing SBIR/STTR competitiveness, supporting JobsOhio innovation districts, and growing high-skill workforce pathways through experiential R&D. These programs reflect OFRN's role not just as a funder, but as a statewide innovation strategy that continues to shape how Ohio builds and sustains federally aligned research capacity.

Together, APEX, OnRamp Hub: Ohio, and NAAMCE demonstrate how OFRN has become a blueprint for strategic R&D investment, technology and supply-chain transition, workforce development, and federal mission engagement.

Securing Ohio's Future in Defense, Aerospace, and Advanced Technology



Figure 3: OFRN as an Engine Driving Ohio's Future in Defense, Aerospace, and Advanced Technology.

Figure 3 illustrates how OFRN positions Ohio to lead in the next decade of aerospace, defense, and advanced technology innovation by serving as the engine driving the state's future growth. As federal mission needs accelerate in areas such as applied AI, biomanufacturing, contested logistics, quantum-enabled sensing, directed energy, and hypersonics, OFRN strengthens Ohio's national competitiveness by shaping emerging federal missions, ensuring Ohio institutions remain indispensable to DoD and NASA, and capturing a larger share of federal R&D investment.

At the same time, OFRN expands Ohio's aerospace and defense industry base by accelerating company formation, enabling technology transfer, attracting private-sector investment, and growing in-state supply chains that anchor high-paying jobs across all regions. Tangram Flex and Kairos Research are examples of two successful spinouts from OFRN projects. Tangram Flex has received over $143.1M in Federal contract awards and Kairos has received over $8.5M in contract awards – all in the state of Ohio. The program also builds and retains the high-tech workforce of the future through its Student Experiential Engagement (SEE) talent pipeline, creating pathways into federal labs and industry and deepening the talent pool necessary for Ohio's advanced manufacturing, aerospace, and defense sectors. In addition, OFRN helps accelerate Ohio's role in space, energy, and next-generation transportation by enabling leadership in commercial space manufacturing, LEO operations, high-power energy systems, hybrid-electric propulsion, and Advanced Air Mobility—leveraging NASA Glenn's world-class capabilities to expand state industry. Most importantly, OFRN future-proofs Ohio's innovation economy by integrating universities, industry, federal laboratories, and state economic priorities into a single, co-funded system capable of adapting to new national priorities and technological shifts. Together, these future-facing impacts illustrate how OFRN keeps Ohio ahead of the curve and positions the state as a national leader in defense innovation, high-tech economic growth, and next-generation workforce development.

Program Management & Process

OFRN Program Governance & Decision-Making Process

The Ohio Federal Research Network operates through a structured, multi-layered governance and decision-making model (Figure 4) that ensures state-funded research is mission-aligned, economically impactful, and focused on applied, transition-ready innovation. Unlike basic research programs, OFRN funds only applied research and development at TRL-3 and higher—equivalent to DoD S&T categories 6.2 (Applied Research) and 6.3 (Advanced Technology Development). This focus on transition-oriented R&D distinguishes OFRN from traditional academic research programs and ensures that every investment moves technologies closer to operational use, commercialization, or federal adoption.



Figure 4: OFRN Network Construct

OFRN's process integrates continuous coordination among the Ohio Department of Higher Education (ODHE), Parallax Advanced Research, Ohio's federal mission partners, the Technical Review Council (TRC), and the Executive Review Board (ERB). Together, these entities guide a competitive and rigorous selection process designed to ensure that funded projects:

- Align with Ohio's state priorities and economic development goals
- Address mission needs and technology gaps identified by AFRL, NASIC, NASA GRC, NAMRU-D, and the Ohio National Guard
- Demonstrate strong technical merit, transition potential, and commercialization pathways
- Support university–industry teaming and statewide collaboration

This governance structure ensures that OFRN investments deliver near-term relevance and long-term impact, advancing DoD and NASA missions while strengthening Ohio's technology economy.

OFRN Stakeholder Network Construct

The OFRN program is managed by Parallax Advanced Research, operating as a subcontractor to The Ohio State University, and is guided by strategic oversight from the Executive Review Board (ERB) and technical evaluation by the Technical Review Council (TRC). Figure 4 illustrates how this organizational

framework operates in practice—showing how state priorities, federal partner research needs, industry engagement, and academic capabilities converge to shape OFRN's funding decisions. The diagram depicts the coordinated relationship between the State of Ohio, OFRN's five federal mission partners (NASA GRC, AFRL, NASIC, NAMRU-D, and the Ohio National Guard), the ERB, the TRC, and the program management team. Collectively, this construct ensures that OFRN investments remain aligned to mission-critical challenges, grounded in applied research at TRL-3 and higher, and poised for maximum transition and economic impact.

How OFRN Funding Decisions Are Made

OFRN follows a requirements-driven, multi-stage selection process that ensures funded research is applied research (TRL-3+), technically credible, mission-aligned, commercially relevant, and capable of generating follow-on investment. Federal partners (Figure 5)—including AFRL, NASIC, NASA Glenn Research Center, NAMRU-D, and the Ohio National Guard—play an active role throughout this process by shaping applied research priorities, developing and refining the Areas of Interest (AOIs) for each funding round, delivering subject-matter expertise, assessing technical alignment, advising on feasibility and transition pathways, and in many cases contributing directly to project execution. This iterative process allows federal subject-matter experts to work closely with OFRN leadership to communicate emerging mission needs, national security priorities, and technology gaps across every stage of the project lifecycle.



Figure 5: OFRN Federal Partners

Teams respond to AOIs through a two-stage competitive process: (1) proposals are screened for mission alignment and feasibility; and then (2) full proposal submission is evaluated on technical merit, economic value, workforce impact, commercialization potential, and relevance to federal research needs.

Subject-matter experts from Ohio's federal research laboratories review all proposals to verify alignment with the AOI sub-topic requirements. The Technical Review Council (TRC)—composed of senior federal researchers, industry experts, academic leaders, and state technical advisors—serves as the primary evaluation body for full proposals. The TRC conducts a rigorous, criteria-based review modeled after Small Business Administration evaluation standards, assessing each submission for technical merit, feasibility, team capability, mission alignment, commercialization potential, and overall project readiness (including TRL-3+ maturity). After independent scoring and ranking, the TRC provides formal recommendations to the Executive Review Board (ERB).

The ERB serves as the final decision authority for project selection and funding. Comprised of senior leaders representing Ohio's federal research installations, state agencies, industry, and universities, the ERB ensures that OFRN investments align with state priorities, support federal mission needs, strengthen Ohio's industrial base, and deliver meaningful economic and workforce outcomes. The ERB reviews the TRC's ranked recommendations and selects a balanced portfolio of projects with strong technical merit, transition potential, and direct relevance to Ohio's aerospace and defense ecosystem.

Figure 6 provides a visualization of the decision authorities involved in the TRC evaluation and the ERB selection. The OFRN decision-making process ensures that state-funded research is aligned with federal priorities, rigorously evaluated by technical experts, and approved by a cross-sector Executive Review Board.

Reviewer (ERB & TRC) Composition

Executive Review Board	Designee
Chair, Industry, Carmen Partners	Dr. Mike Triplett
Case Western Reserve University	Dr. Michael Oakes
The Ohio State University	Dr. Steven Ringel
Bowling Green State University	Dr. Rodney Rogers
Miami University	Dr. Gregory Crawford
Cleveland State	Dr. Laura Bloomberg
Kent State University	Dr. Todd Diacon
Youngstown State University	Bill Johnson
Industry, Enable Injections	Mike Hooven
Ohio Department of Transportation	Rich Fox
Ohio Department of Development	Scott Ryan
Independent	Dr. Dave Williams
Non-Voting Members	
AFRL	Dr. Tim Bunning
NASA-GRC	Dr. Jimmy Kenyon
NASIC	Steven Zech
NAMRU-D	Dr. Richard Arnold
Ohio National Guard	Brig Gen Matthew Woodruff

Technical Review Council	Designee
University of Cincinnati	Scott Petersen
Kent State University	Dr. Christina Bloebaum
University of Toledo	Dr. Arun Nadarajah
Youngstown State University	Dr. Sev Van slambrouck
Case Western Reserve University	Dr. Chris Zorman
Bowling Green State University	Dr. Joseph Furgal
Bowling Green State University	Dr. Imran Tusar
Bowling Green State University	Dr. Mohammed Abouheaf
Industry, NCDMM	Dr. Edward Herderick
Business, PQR Energy	Jim Wheeler
Business, Ohio Innovation Fund	Faith Voinovich
The Ohio Academy of Science	Michael Woytek
Industry, DriveOhio	Santos Ramos
Business, Factor 7 Medical	Kim Frazier
Industry, OneDefense	Chris Eusebi
AFRL	Brian McJilton
NASA GRC	Maxwell Briggs & Eric Clark
NASIC	Steven Zech
NAMRU-D	Dr. Richard Arnold
Ohio National Guard	Maj Don Braskett

Figure 6: Overview of the OFRN Funding Review Process from Federal Requirements to TRC Evaluation and ERB Final Selection

Figure 7 illustrates this multi-stage governance model, from federal requirements development to TRC evaluation and final ERB selection. This process entails:

1. **Technical Review Council (TRC) Evaluation**

   The TRC, comprised of representatives from Ohio-based federal laboratories industry experts, academic researchers, and state technical advisors, conducts the first major gate review. The TRC:

   - Reviews and scores all proposals
   - Ranks submissions against published criteria
   - Assesses alignment with government AOIs & sub-topics
   - Recommends the most meritorious and mission-aligned projects to the ERB

2. **Executive Review Board (ERB) Decision Authority**

   The ERB, comprised of leaders from Ohio's federal partner installations, State government (ODoD, ODoT), industry, universities, and is the final decision-making body for OFRN funding. The ERB:

   - Provides strategic oversight of OFRN
   - Evaluates TRC recommendations
   - Approves, rejects, or modifies the recommended project portfolio
   - Ensures alignment with our federal partners



Figure 7: OFRN Program Governance & Decision-Making Process

3. **Program Management & Oversight**

   Once projects are funded, Parallax Advanced Research manages day-to-day execution, including:

   - Contracting & procurement
   - Monthly project reviews with the Parallax team
   - Quarterly project reviews with the Federal partners and semi-annual reviews with the federal subject matter experts
   - Deliverables management
   - Financial compliance
   - Commercialization and workforce development support

Why This Governance Model Works

The process—rooted in state priorities, federal needs, and rigorous technical review—ensures that:

- State funding drives high-impact applied research
- Ohio institutions are better positioned to win federal awards
- Projects have clear commercialization pathways
- Teams include both universities and industry
- Workforce development is integrated from the start
- Funded technologies are more likely to transition into DoD, NASA, or commercial adoption

This structure is the reason OFRN has become one of Ohio's most effective and mission-aligned research and innovation engines.

OFRN Leadership Team



Dennis Andersh
CEO and President of Parallax Advanced Research



Mark Bartman, Maj Gen (Ret)
Program Executive
OFRN



John Owen
Program Manager
OFRN



Becky Mescher
Program Coordinator
OFRN

Figure 8: OFRN Leadership Team

Figure 8 highlights the OFRN leadership team, which consists of: Dennis Andersh, CEO and President of Parallax Advanced Research, and Mark Bartman, Maj Gen (Ret.), USAF, who are the program executives. Key to their success is Parallax Advanced Research support staff including John Owen as the Program Manager, and Becky Mescher as the Program Coordinator.

These leaders regularly provide OFRN briefings to key partners, state officials, and other interested groups across the state of Ohio. This open and transparent briefing process is part of their commitment to build a partnership coalition that allows Ohio's research and industry talent to be exemplified, with the goal of boosting the State of Ohio's overall economic impact to bring more federal research dollars to the state.

Program Results Overview

Relationships with Ohio's federal installations are a core strength of the program. Regular briefings, collaboration workshops, and technical reviews deepened engagement with AFRL, NASIC, NASA Glenn, NAMRU-Dayton, and the Ohio National Guard. These interactions helped shape OFRN solicitations, guided project selection, and ensured that state-funded applied research aligned with the long-term needs of federal sponsors. This alignment continues to be a major differentiator for Ohio—one that expands research opportunities, strengthens mission-critical programs, and supports federal workforce development pipelines.

OFRN also advanced statewide workforce development through the Student Experiential Engagement (SEE) program, which integrated interns and graduate researchers into real-world R&D teams. Participants gained hands-on experience supporting project testing, modeling, simulation, fabrication, and data analysis. The SEE program continues to cultivate the next generation of Ohio's defense and aerospace workforce while increasing the technical capacity of OFRN-funded projects. By integrating 228 students across 17 Ohio colleges and universities into real-world R&D teams, the SEE program strengthens the state's future talent pipeline and increases the technical capacity of companies and research organizations participating in OFRN projects. These students contribute directly to project execution—supporting testing, modeling, simulation, data analysis, and fabrication—which reduces project cost, accelerates development timelines, and expands the overall economic value of state-funded research investments.

In addition, the SEE program amplifies the return on investment of OFRN's statewide engagement efforts. Throughout the year, OFRN expanded participation through Opportunity Days, executive reviews with federal partners, and outreach events that connected student-supported research teams to federal opportunities such as SBIR/STTR. This integration positions students for high-tech career pathways in

Ohio's defense and aerospace sectors and helps retain talent within the state, strengthening Ohio's long-term workforce competitiveness.

This network has produced a level of economic and technological return unmatched by any other state-led R&D program in Ohio. Figure 9 shows the impact of the OFRN program from inception through funding Round 7. From an initial $72 million in state investment, OFRN teams have generated more than $436 million in follow-on funding, attracted $43 million in industry and academic cost-share, and delivered 48 mission-aligned research projects that advance capabilities in hypersonics, space systems, quantum, digital engineering, human performance, advanced materials, and autonomous systems.



Figure 9: OFRN Program Impact (Rounds 1-7)

The impact also extends well beyond research outputs. OFRN has enabled the creation of 17 new Ohio-based spinoff companies, strengthened supply chains, and supported 427 high-skilled jobs tied directly to defense, aerospace, and advanced technology sectors. These companies and jobs aren't clustered in a single city—they're distributed across Ohio's JobsOhio regions, ensuring that innovation-driven economic growth reaches communities statewide.

As Ohio continues to expand its role as a national leader in aerospace, defense, and advanced manufacturing, OFRN represents a proven vehicle for strategic state investment. The program strengthens Ohio's position in emerging federal mission areas, drives research commercialization, supports job creation, and enhances the long-term competitiveness of Ohio's innovation economy. OFRN remains a critical asset for ensuring that Ohio not only keeps pace with national priorities—but leads them.

Partnerships

AFRL has been partnering with OFRN ever since Round 1. The big value proposition that it brings to AFRL is the fact that we are building upon the S&T ecosystem in the state of Ohio. The small businesses and even the universities that are in our backyard being able to help bolster their ability to provide S&T solutions."

Brian McJilton, Director, AFRL Small Business Program Office, Air Force Research Laboratory

Statewide Reach & Impact

In collaboration with our federal partners, the OFRN continues to focus on applied research inthe state of Ohio. Figure 10 illustrates the breadth of our impact around the state.

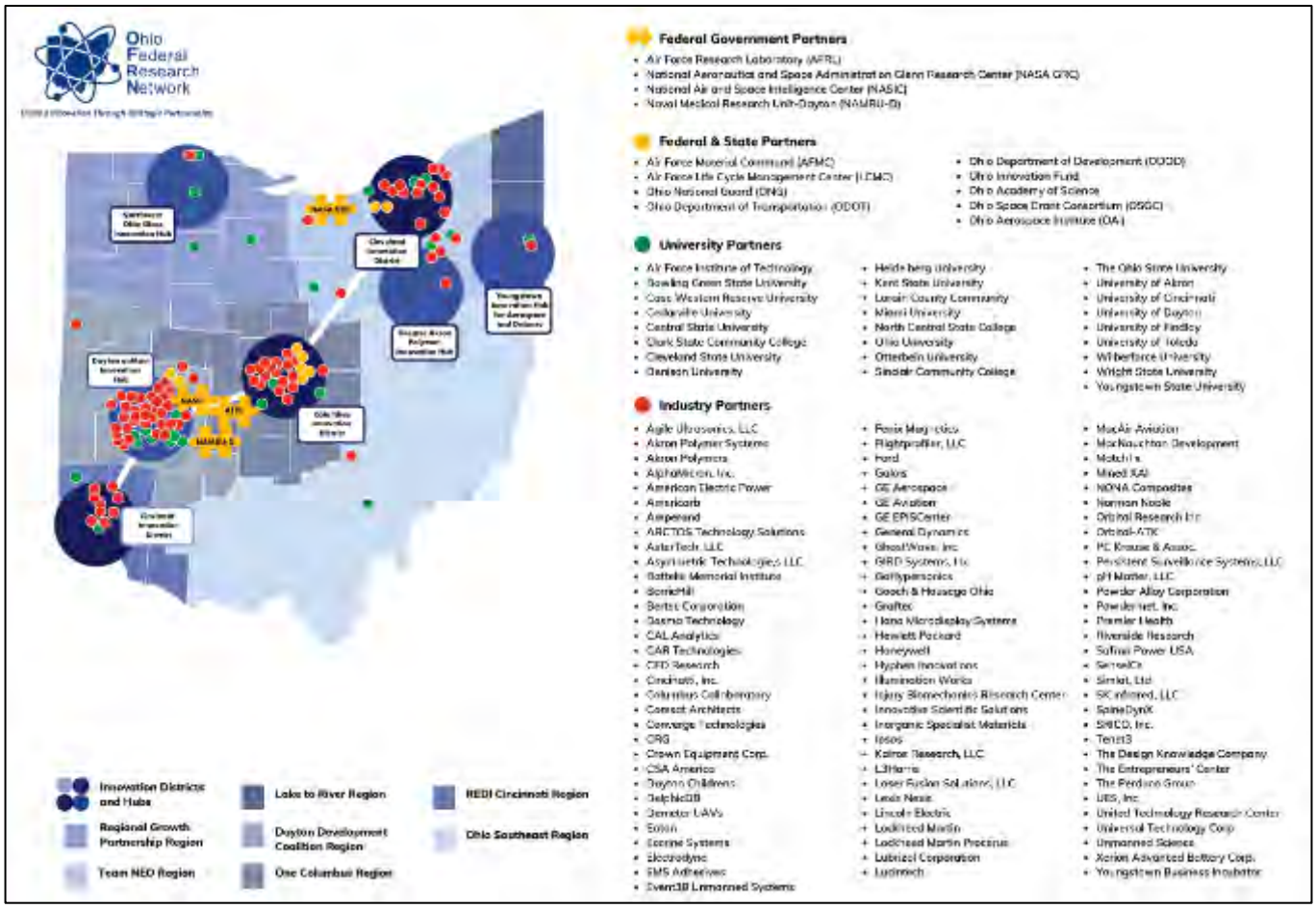


Figure 10: Ohio Innovation Map

OFRN is uniquely structured to reach every major region of Ohio, connecting federal installations, universities, and industry partners into one cohesive innovation ecosystem. The distribution of red, yellow, and green markers shows how OFRN-funded projects, collaborators, and partnerships extend far beyond any single city—touching rural, suburban, and urban communities across all of Ohio's major economic and geographic corridors. The map also highlights OFRN's unique ability to connect Ohio's five major federal partners—AFRL, NASIC, NASA-GRC, NAMRU-D, and the Ohio National Guard—with 25 universities and more than 100 industry partners statewide. These linkages enable knowledge flow, technology transition, and cross-sector collaboration that no other program in Ohio currently provides at this scale. Because OFRN projects are intentionally distributed across multiple regions, the economic and workforce benefits of the program reach every part of the state—not just federal base communities.

Moreover, OFRN's footprint aligns directly with the JobsOhio Innovation Districts in Cincinnati, Columbus, Cleveland, Dayton, Akron, and Youngstown. This alignment ensures that state-funded research investment reinforces existing regional strengths while also expanding high-tech opportunities into emerging and underserved areas. By anchoring projects in and around these districts, OFRN supports the commercialization pipelines, workforce development initiatives, and federal mission priorities that JobsOhio and the state rely on to grow competitive sectors like aerospace, advanced manufacturing, energy, biomedical innovation, and intelligence systems.

Why This Matters for Ohio

Without the OFRN, Ohio would not have the same visibility, access, or competitiveness in securing federal research funding or defense innovation opportunities. With OFRN, Ohio has a proven, scalable, and nationally recognized model for building future technologies, catalyzing company formation, and positioning the state as an indispensable partner to the Department of Defense and NASA.

OFRN is not just supporting Ohio's goals—it is outperforming expectations, driving measurable return on investment, and ensuring that Ohio continues to lead in the nation's most strategically important technology domains. Continued support for the program is essential to maintain this momentum and to position Ohio for the next generation of federal missions and economic opportunities.

Funded Research Project Rounds

The infographic in Figure 11 provides a comprehensive view of the research projects funded through the Ohio Federal Research Network and illustrates how each effort aligns to specific application domains across aerospace, defense, and advanced technology missions. The distribution of projects across categories—ranging from control systems and structural materials to propulsion, sensing, communications, power, autonomy, planning, and hypersonics—demonstrates the breadth of Ohio's technical capabilities and the strategic depth of OFRN's investment portfolio.

The visualization highlights that OFRN projects are not isolated research efforts; they form a coordinated, mission-focused pipeline that supports the needs of Ohio's federal partners, including AFRL, NASIC, NASA Glenn, NAMRU-D, and the Ohio National Guard. By funding projects across multiple interconnected disciplines, OFRN strengthens the entire innovation ecosystem: advancing foundational science, accelerating technology transition, enabling commercialization opportunities, and preparing Ohio's workforce for emerging national priorities.

Ohio Federal Research Network

Driving Innovation Through Strategic Partnerships

Ongoing or Completed 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"
R6 - The Ohio State University: "Structural Materials Joining in Space"
R7 - Ohio State University: "Photonic Interfaces for Atom-based Quantum Processors"
R7 - Laser Fusion Solutions: "Joining of ODS Additive Materials"

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: "Brushless Doubly-fed Machine and Drive System for Aviation Application"

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: "Autonomous Capabilities for CASEVAC and Resupply in Urban Environments (ACCRUE)"
R6 - GhostWave: "Quantum Sensor System using Rydberg Atoms"

COMMUNICATION
R2 - Wright State University: "C2PNT Intelligent Channel Sensing"

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: "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"
R6 - University of Akron: "High Bandwidth Light Weight Modular GaN Based Utility Interactive DC Generator"
R7 - Ohio State University: "Gas-insulated Cable with Integrated Partial Discharge Detection for Aerospace Systems"

AEROSPACE AWARENESS
R2 - Wright State University: "Human-Centered Big Data"
R3 - University of Cincinnati: "Regional Unmanned Traffic Management System (RUTMS)"
R4 - GhostWave: "Integrated Optical-Radar Sensor Fusion System for Air Space Awareness"
R5 - Flightprofiler: "Low Altitude Weather Network (LAWN)"
R7 - Ohio State University: "Space GUIDE: Spaceborne Gain-enabled Ultra-sensitive Infrared Detector with Event-based sensing"

COMMAND & CONTROL
R1 - Wright State University: "Sliding-Scale Autonomy through Physiological Rhythm Evaluations (SAPHYRE)"
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"
R6 - Kairos Research: "Ocular and Physio-Temporal Indicators of Cognitive State (OPTICS)"
R7 - Mined XAI: "Resilient Explainable AI for Casualty Triage with Logistics Awareness Using Deep Topological Modeling (REACT-X)"
R7 - Kairos Research: "Validated Indicators for Selective Trust in Autonomy (VISTA)"

PLANNING
R1 - Wright State University: "Regional Live-Virtual-Constructive Enterprise (RLVC)"

HYPERSONICS
R6 - CFD Research Corporation: "A Machine Learning Framework for Digital Engineering of Hypersonic Vehicles with Quantified Prediction Uncertainty (Hypersonic ML FW)"
R6 - ARCTOS Technology Solutions: "Gradient Alloy Processing in Laser Powder Bed Fusion for Hypersonic Applications"
R7 - AsterTech: "Hypersonic Engineered Reusable Ceramic Ultra-Lightweight Enduring System (HERCULES)"

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
R6 - The OFRN Round 6 projects
R7 - The OFRN Round 7 projects

Visit our website to learn about each initiative and project round: www.ohiofrn.org/ohio-federal-research-network-rd

Figure 11: OFRN Projects (Rounds 1-7)

Rounds 1–5 (FY16–23): Establishing the Foundation of Ohio's Defense & Aerospace Innovation Network

The first five rounds of the Ohio Federal Research Network laid the essential foundation for one of Ohio's most effective and mission-aligned research and innovation engines. Across these rounds, OFRN strengthened statewide research capacity, expanded university–industry partnerships, and established enduring collaborations with Ohio's federal laboratories—including AFRL, NASA Glenn, NASIC, NAMRU-D, and the Ohio National Guard.

Rounds 1–4 focused on building the fundamental capabilities Ohio needed to become a national leader in defense and aerospace innovation. These rounds advanced core technologies in autonomy, sensing, advanced materials, propulsion, digital engineering, and human performance while developing the partnership structures that enabled sustained coordination between universities, industry, and federal mission partners.

Round 5 built directly on this foundation, expanding Ohio's applied research capabilities into next-generation areas such as UAS systems, microelectronics, and advanced power systems. These investments provided the technical and workforce base that would support more advanced, mission-critical disciplines in later rounds—including, artificial intelligence, human factors, data analytics, space commercialization, quantum communications, and advanced power systems.

Round 1: Centers of Excellence (FY16-17)

Round 1 initiated OFRN's core mission: to build multi-institution teams capable of conducting high-impact research aligned with federal priorities. The round focused on establishing Centers of Excellence in areas where Ohio already held competitive advantages:

- Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR)
- Advanced materials and manufacturing
- Advanced Communications Positioning, Navigation, and Timing (PNT) and Sophisticated Software (SW)
- Energy Storage / Integration
- Human performance and health sciences
- Power and Propulsion

These initial centers forged long-term collaborations between Ohio universities, federal labs, and industry partners. They also validated the OFRN model: aligning state investment with federal technology needs to accelerate innovation and commercialization.

FY26 Round 1 project updates:

- Adaptive Bio-Inspired Aerospace Structures Actuated by Shape Memory Alloys project reported awarded $1.5M of follow-on funding from America Makes for an impact welding and phase change enabled sealing for high-temperature metal-composite interfaces project

Strategic purpose: Build Ohio's baseline R&D capacity in aerospace, propulsion, sensing, and human-centered technologies to support AFRL, NASA Glenn, and state economic priorities.

Round 2: Centers of Excellence Expansion (FY17-18)

Round 2 expanded the Center of Excellence model to deepen Ohio's strengths in mission-critical domains. Projects in this round advanced:

- Health and Human Performance
- Big Data
- Next-generation materials for aerospace structures

- Advanced propulsion and power systems
- UAS autonomy, data analytics, and flight-safety technologies
- Advanced Communications

Round 2 also broadened industry engagement and introduced more direct ties to technology transition pathways within AFRL, NAMRU-D and NASA.

> *We had a project in Round 2. It was collaborative with Ohio State University and two other universities where we opened up the labs. The research was conducted at NAMRU-D. It resulted in a new capability being established at the lab in partnership with OSU. We hired an OSU PhD graduate who was involved in the project. He built the lab and we've probably employed about 15 or 20 researchers in that lab since that time. There's some great job growth for the state for jobs in in Ohio, but also a capability that was added to our lab which again enhances our ability to support the war fighters." – Dr. Richard Arnold, Director of the Naval Aerospace Medical Research Laboratory (NAMRL) at Naval Medical Research Unit – Dayton (NAMRU-D)*

FY26 Round 2 project updates:

- The Human-Centered Big Data (HCBD) project continues to leverage the team and know-how that was built with OFRN investment and involve the same core technical focus areas as their OFRN HCBD project, namely: explainable AI (XAI), machine learning, natural language processing, and human-machine interaction through Kairos Research totaling $12.23M. Two patent applications have also been submitted (Application No. 19/008,177, and Application No. 63/836,120)

Strategic purpose: Extend Ohio's technical leadership in aerospace and materials science while building scalable university–industry teams aligned to federal research priorities.

Round 3: Sustaining Ohio's Aeronautical Readiness and Innovation in the Next Generation (SOARING) Initiative (FY18-19)

Round 3 marked a shift toward mission need–driven solicitations, focused specifically on accelerating technology transition. The Sustaining Ohio's Aeronautical Readiness and Innovation in the Next Generation (SOARING) initiative supported more applied projects that bridged early R&D with prototype development and validation. This round focused on expanding Ohio's leadership in federal and industry aerospace research, development and sustainment for unmanned air systems (UASs), personal air vehicles (PAVs), and logistics delivery air vehicles (LDVs). The focus areas included:

- Plug-and-Play Payloads
- Universal Translator and Monitoring
- Field Swappable Aircraft Variants
- Automated Data-Feed Analytics
- Human Operational Effectiveness Policy
- Onboard Energy
- Cryogenic Engines, Superconducting Magnetic Energy Storage (SMES), and Induction Motor
- Onboard Protocols for Non-Traditional Systems
- Computational Efficiencies and Onboard Heat Management
- Human Interpretation and Traffic Management in a Flexible Airspace
- Automation, Qualification, and Subcomponent Packaging
- Virtual Accelerator from Distributed Prototyping to Scaled Production of Flight-Worthy Parts
- Integrated Communications and Sensors
- Detect and Avoid
- Security Assurance, Encryption, and Testing
- Alternative Airfield Technologies

This round emphasized direct collaboration with federal subject-matter experts and increased opportunities for commercialization and follow-on federal funding.

Strategic purpose: Move OFRN-supported technologies closer to transition and strengthen Ohio's competitiveness in securing SBIR/STTR and federal acquisition opportunities.

Round 4: Sustaining Ohio's Aeronautical Readiness and Innovation in the Next Generation (SOARING) Initiative Expansion (FY20–21)

Round 4 expanded the Sustaining Ohio's Aeronautical Readiness and Innovation in the Next Generation (SOARING) initiative model with more targeted investment in technologies prioritized by AFRL, NASA Glenn, and NASIC. These projects advanced:

- Onboard energy
- Integrated communications and sensors
- Detect and avoidance of threats and perimeter monitoring
- Field swappable aircraft variants
- Automated Data-Feed Analytics
- Onboard protocols for non-traditional systems
- Computational Efficiencies and Onboard Heat Management
- Human Interpretation and Traffic Management in a Flexible Airspace

This round also strengthened Ohio's innovation districts and increased engagement with small and mid-sized Ohio companies while advancing critical workforce and internship components.

FY26 Round 4 updates:

- A recent spinout reported from the round 4 project led by the Youngstown Business Incubator is Agilis Air – a drone manufacturer in Ohio. Agilis Air was selected as a Phase II Qualifier for the U.S. Department of War's $1 billion Drone Dominance Program. Agilis Air was selected across two separate mission categories: Mission A (long-range strike) and Mission B urban strike) (figure 12). This positions Agilis Air as a leading contender for future production opportunities under the Drone Dominance Program including the potential award of production contracts exceeding 8,000 drones.



Figure 12: DDP Qualifier Badge

Strategic purpose: Deepen Ohio's capabilities in emerging aerospace sectors—addressing technical and FAA certification challenges facing the Federal and State research entities and the Ohio aerospace industry. —while expanding industry participation and preparing for commercialization and production opportunities.

Round 5 (FY22–23)

Round 5 marked a pivotal stage in the evolution of the OFRN program. Over Fiscal Years 2023–2024, the OFRN portfolio advanced research in mission-critical domains aligned with the needs of Ohio's federal installations and high-growth technology sectors statewide. Rounds 5 and 6 established strong foundations in disciplines that continue to shape Ohio's competitiveness in defense, aerospace, and advanced manufacturing.

Round 5 focus areas directly supported the missions of the Air Force Research Laboratory (AFRL), National Air and Space Intelligence Center (NASIC), NASA Glenn Research Center, Naval Medical Research Unit–Dayton (NAMRU-D), and the Ohio National Guard. Round 5 Areas of Interest included:

- Vertical Take-Off & Landing (VTOL)
- Situational Awareness and Proliferated Surveillance Systems
- Patient care in austere and contested environments
- Personal Exposure Devices
- Acceleration Effects
- Improving Human-Machine Teaming Performance Using Brain-Machine Interface (BMI) Technologies

- Large Data Set Triage
- Journal Article Warning and Correlation
- Applications of commercial satellites to humanitarian, disaster, and defense topics
- Quantum Communications
- Advanced Power Systems Applicable to Aviation Propulsion, Micro-Grids, and Lunar Surface Operations

FY26 Round 5 project updates:

- The round 5 project that produced the IronClad product reported securing another $5M from SOCOM and other SOF clients for both limited rate production of IronClad units plus continued capability upgrades, leveraging the technologies developed in both OFRN Round 4 and 5.
- A visibility tool becomes the first mobile app to turn any smartphone into an aviation grade visibility sensor. With the support and flexibility of the Ohio Federal Research Network (*OFRN*), the FlightProfiler team navigated multiple pivots—ultimately producing a breakthrough capability for general aviation pilots, drone operators, and the emerging AAM ecosystem. After completing technical validation across different mobile devices, the FlightProfiler Team navigated Apple and Google's approval processes, including privacy policies, regulatory compliance documentation, as well as application evaluation. In late 2025, Visibility Tool officially launched.

  "Our team's first swing at bat wouldn't have connected. OFRN gave us the room to pivot—multiple times—until we found the Visibility Tool Technology evolved into what customers wanted." Ethan Krimins, President of FlightProfiler

Strategic purpose: Strengthen Ohio's statewide research base by advancing foundational technologies essential to next-generation aerospace and defense capabilities. By targeting foundational technologies and enabling multidisciplinary collaboration, Round 5 strengthened Ohio's long-term ability to develop, transition, and commercialize innovations essential to national security and economic growth.

Specifically, Round 5 expanded Ohio's network of university–industry–federal partnerships. Projects brought together researchers from multiple Ohio universities with industry partners and federal lab subject-matter experts, creating applied R&D teams capable of moving technologies from concept to early prototype. These collaborations reinforced federal confidence in Ohio's R&D ecosystem and increased industry participation in defense-aligned innovation.

Moreover, Round 5 laid the groundwork for the more advanced work undertaken in Round 6, establishing the technical baselines, partner relationships, and statewide capacity required to accelerate progress in hypersonics, digital engineering, quantum sensing, and high-power energy systems.

Round 6 (FY24-25)

Round 6 expanded the program into some of the most advanced, federally prioritized technology domains—hypersonics, human performance, high-power energy conversion, digital engineering tools, commercial space in low Earth orbit, and quantum sensing. These disciplines are essential to next-generation aircraft and spacecraft, space systems, advanced materials, modeling environments, and mission readiness capabilities needed by DoD and NASA today.

Round 6 projects operated statewide, each aligned to the critical technology priorities of Ohio's federal partners. All six concluded their period of performance on June 30, 2025, delivering mission-relevant advancements in hypersonic materials processing, high-power energy systems, digital twin modeling frameworks, biotechnology and human performance tools, LEO in-space manufacturing, and quantum-enabled sensing technologies. This round further strengthened applied research ties with AFRL's 711 HPW and RX Directorates, NASIC, NASA Glenn's propulsion and space systems divisions, and Ohio National Guard autonomy and resilience initiatives.

These projects did far more than met research milestones—they generated measurable economic and

technological returns for the state. OFRN Round 6 projects collectively produced:

- $14,901,396 in follow-on funding
- $ 2,017,919 in industry and academic cost share
- 27 new jobs created in Ohio
- 2 new Ohio-based spinoff companies launched

This round's spinoffs—Fuse-X (The Ohio State University, Project 609) and the reactivated Star Phase Technologies (University of Akron, Project 619)—add to the total number of OFRN-enabled companies; today's total is 17. Each represents new jobs, new technologies, and new revenue streams anchored within the state's innovation economy.

Round 7 (FY26-27)

Round 7 represents a strategic evolution of the OFRN program. In FY26, OFRN awarded $8.37 million to seven collaborative research projects, expanding the portfolio into new technological areas driven by urgent state and federal needs. Round 7 deliberately extends OFRN's reach into disciplines that directly support Air Force Science & Technology Strategy, NASA Glenn mission requirements, National Defense Industrial Strategy (NDIS), JobsOhio's innovation sectors, and statewide economic development goals in aerospace, materials, energy, and digital systems.

Round 7 projects strengthen Ohio's competitiveness by focusing on interdisciplinary R&D that advances capabilities in:

1. **Hypersonics**

   OFRN-funded research is enabling the development of high-temperature materials, advanced manufacturing processes, digital engineering methods, and system-integration tools required to design, build, and field hypersonic capabilities at scale. Round 7 includes work on solutions to the technical problems of reusable hypersonic aircraft that require vehicle and system designs that operate across multiple flight environments, and the associated aero-thermodynamics challenges.

2. **Biomedical & Human-Centered Technologies**

   Several Round 7 efforts address the intersection of aerospace demands and human performance—supporting NAMRU-D's medical research mission and the Air Force's need for improved physiological monitoring and performance optimization tools.

3. **Energy Systems & Electrification Technologies**

   Round 7 includes work on high-efficiency power systems, advanced energy conversion, and grid-relevant technologies, supporting both DoD energy resilience priorities and NASA electrified propulsion efforts.

4. **Space and LEO Mission Support Technologies**

   Projects support NASA Glenn's spaceflight systems, materials for in-space manufacturing, and commercial space partnerships—helping Ohio companies transition into the rapidly growing LEO economy.

5. **Quantum Technologies**

   Round 7 advances Ohio's leadership in quantum science by supporting the development of quantum communication, computation, and sensing technologies critical to future defense and space missions. These projects focus on enabling higher-fidelity quantum systems, improving robustness in operational environments, and strengthening Ohio's role in national quantum technology initiatives led by AFRL, NASA, and the broader DoD enterprise.

6. **Autonomous and AI-Enabled Systems**

   Round 7 further strengthens Ohio's research base in autonomy, leveraging statewide industry–academic teams to build systems that support Ohio National Guard, AFRL autonomy programs,

and future Intelligent Air Mobility initiatives.

7. **Advanced Materials & Manufacturing for Defense and Space**

   Projects expand on critical materials supply for aerospace, composite systems, additive manufacturing, and high-temperature materials. These technologies directly support AFRL's structural materials portfolio, NASA Glenn propulsion research, and Ohio's advanced manufacturing clusters.

Round 7 projects (figure 13)

Proj #	Project Title	Awarded	Follow-On (Projected)	AOI	Lead	Team	Government Partner
716	Space GUIDE: Spaceborne Gain-enabled Ultra-sensitive Infrared Detector with Event-based sensing	$ 1,250,000	$ 7,000,000	Commercial Space in Low Earth Orbit	The Ohio State University	The Ohio State University (Lead), AFIT, SK Infrared, SenselCS	AFRL
718	Photonic Interfaces for Atom-based Quantum Processors	$ 1,148,105	$ 3,800,000	Quantum Technologies	The Ohio State University	The Ohio State University (Lead), Denison University, SRICO Inc.	AFRL, NASA GRC
724	Joining of ODS Additive Materials	$ 1,133,686	$ 7,500,000	Advanced Materials Technology – Critical Materials Supply for Aerospace	Laser Fusion Solutions LLC	Laser Fusion Solutions LLC (Lead), Wright State University, The Ohio State University, Hyphen Innovations, Powder Alloy Corporation, North American Manufacturing Pros	AFRL, NASA GRC
736	Validated Indicators for Selective Trust in Autonomy (VISTA)	$ 1,249,875	$ 16,150,000	Autonomy	Kairos Research LLC	Kairos Research (Lead), Wright State University, Sinclair Community College, Dayton Entrepreneur's Center	AFRL, NAMRU-D
738	HERCULES: Hypersonic Engineered Reusable Ceramic Ultra-Lightweight Enduring System	$ 1,250,000	$ 6,750,000	Hypersonics	AsterTech LLC	AsterTech (Lead), The Ohio State University, Cleveland State University	AFRL
739	Gas-insulated Cable with Integrated Partial Discharge Detection for Aerospace Systems	$ 1,093,778	$ 25,500,000	Aerospace Power Management, Materials, and Distribution	The Ohio State University	The Ohio State University (Lead), Miami University, Case Western Reserve University, GE Aerospace Electric Power, GE Aerospace Research	AFRL
740	REACT-X: Resilient Explainable AI for Casualty Triage with Logistics Awareness Using Deep Topological Modeling	$ 1,240,000	$ 2,950,000	Health and Human Performance	Mined XAI	Mined XAI (Lead), The Ohio State University, Wright State University, Injury Biomechanics Global, Ohio Manufacturing Innovation Center	AFRL, NAMRU-D, NASA GRC
	Total	$ 8,365,444	$ 69,650,000				

Figure 13: Round 7 projects

These projects did far more than met research milestones—they generated measurable economic and technological returns for the state. In their first ten months, OFRN Round 7 projects have collectively produced:

- $6,155,999 in follow-on funding
- $1,693,423 in industry and academic cost share
- 29 new jobs created in Ohio

Additionally, Round 7 continues the SEE program, which provides STEM students across the state and particularly from collaborator universities the opportunity to work on the Round 7 state-funded R&D projects. This unique opportunity enables students to gain practical experience, advance their portfolios and curriculum vitae, as well as work directly for Ohio small businesses. The goal of the SEE program is to enable student retention in the Ohio workforce following completion of their studies.

> *"The targeted outcome is to turn the students into highly employable engineers and scientists who can plug directly into the industrial work force or at AFRL/NASA GRC, i.e.... because our staff includes former academics, we are also uniquely suited to help student interns navigate the gap between academic and industry research cultures" – Dr. Brad Minnery, CEO, Kairos Research.*

The impact extends well beyond funding and commercialization. OFRN is also building the talent pipeline that Ohio's defense and aerospace sectors urgently need. Through the Student Experiential Engagement (SEE) program, 228 Ohio students—including 42 PhDs, 50 master's students, and 136 undergraduates

from 17 colleges and universities—were embedded in Round 5, Round 6 and Round 7 project teams. Students gained hands-on experience in experiential research, prototyping, modeling, simulation, testing, and advanced R&D while working directly with Ohio companies and federal mission partners. Importantly, the SEE program has opened pathways for students to remain in Ohio, enabling them to transition into full-time roles at Ohio companies, federal laboratories, and university research centers.

Andrew Rockovich is an example of an OFRN project student intern transitioning into the workforce upon graduation. Andrew was a recent graduate of The Ohio State University with his PhD in physics. He had an internship at GhostWave under an OFRN Round 6 project that launched him into his professional career in industry. He was picked up with SRICO and was put on an OFRN Round 7 project and was immediately made the PI of that project and started grinding away on it.

> *"OFRN in general has kind of been invaluable for specifically incentivizing research and technological development in the state of Ohio where now I think there could be a little bit more investment in general in that area." – Andrew Rockovich, SRICO, Inc.*

This workforce development impact ensures that state investments produce long-term economic benefit and that Ohio remains competitive in critical technology fields such as hypersonics, advanced materials, AI/ML, biotechnology, and energy systems.

> *"Being able to adapt and solve problems while balancing a million different things at the same time is really going to help me when I move from college into an actual career." – Will McAuley, Ohio State student and Round 6 SEE participant.*

Why Round 7 Matters: Strategic Expansion for State and Federal Needs

Round 7 marks an important shift toward deeper integration with state and federal priorities. The selected projects:

- Address new, urgent capability gaps identified by federal mission partners
- Strengthen Ohio's research institutions in critical, high-growth disciplines
- Support Ohio National Guard modernization in autonomy, sensing, and resilience
- Support development of the State of Ohio's quantum R&D infrastructure
- Advance NASA's goals for propulsion, materials, and spaceflight systems
- Build supply-chain readiness for defense, aerospace, and energy sectors
- Create new commercialization pathways for Ohio companies
- Expand the state's technical workforce through multidisciplinary R&D

Moreover, the selected projects span critical technology areas—hypersonics, human performance, aerospace power systems, commercial space, quantum technologies, autonomy, and advanced materials—and represent collaborations among 8 Ohio research institutions and 13 industry partners. Collectively, the projects are projected to create 64 new jobs, generate more than $69 million in follow-on funding, and leverage over $3.5 million in cost share commitments.

Together, these outcomes demonstrate that OFRN continues to multiply the impact of every state dollar invested—attracting federal resources, catalyzing commercialization, strengthening Ohio's high-tech workforce, and advancing the mission needs of Ohio's federal installations

Thus, this round strengthens Ohio's role as a national leader in defense and aerospace innovation and ensures that the state continues to meet rising federal demands in next-generation systems, space technologies, and mission-critical R&D.

Appendices

Appendix 1: Round 7 (FY26-27) Portfolio Results

Portfolio Engagement

The OFRN continued a monthly cadence with the current portfolio. The OFRN Executive Director meets with each Program to learn about their progress, guide them on resources and opportunities to accelerate their progress towards the goal of commercialization. The Executive Director also visited with the leaders of the organizations for the on-going projects over this fiscal year to review the organization's capability and increase engagement.

Relationships

The OFRN continued a yearly cadence for the Portfolio to give exposure and share the teams'progress with our Federal Partners. This was accomplished through quarterly Executive Reviews with the Federal Partners and conducting deep dives twice a year that also included the Subject Matter Experts (SME) within the various federal agencies.

Increased SBIR/STTR Connectivity

In addition to the over $27M in SBIR/STTR awards for OFRN-funded teams, the OFRN team worked to connect non-selected teams to SBIR/STTR opportunities that aligned with their OFRN proposal. We supported this through presentations during our quarterly OFRN Opportunity Days where we emphasized the number of SBIR/STTR opportunities across the U.S. government and provided a training session on SBIR/STTR. During this training we also highlighted the extensive SBIR/STTR training available on Parallax's free virtual training portal, if participants wanted further information. Matchmaking services were provided between multiple universities and small businesses to develop teams to submit for SBIR/STTR opportunities throughout this reporting period. Both selected and non-selected OFRN teams were referred to the APEX partnership intermediary agreement for assistance with Air Force and Space Force SBIR opportunities and follow-on transition support. OFRN also contracted One Defense LLC to assist round 7 projects as well as projects from round 6 to advance their commercialization and business objectives by providing individualized consulting support to the OFRN funded projects.

Increased BAA Awareness Connectivity, Teaming and Proposal Support

The OFRN provided training on Broad Area Announcements (BAAs) during our quarterly OFRNOpportunity Days to increase awareness and understanding of the BAA opportunities available across the U.S. government. A specific outcome we were looking to achieve was to build a team under the "OFRN" banner and submit a proposal where OFRN would be the Prime contractor facilitating expeditious proposal submission in support of our network partners.

Opportunity Days (Figure 14)

To accomplish our goals to increase SBIR/STTR Connectivity and BAA Awareness Connectivity, OFRN offered its first Opportunity Day on February 3, 2022, on the topic of NASA Quantum Communications and AFRL Digital Engineering. Since then, the Opportunity Days have become an ongoing quarterly virtual event that further connects and enlarges our network of government, academic, and industry partners, based on posted opportunities and customer discussions. These events feature thought leader presentations from Federal Partners, Academia,



Figure 14: OFRN Opportunity Days August 2025 - May 2026

and Industry, networking, program status updates from OFRN leadership, and Q&A sessions. Since the inception of the Opportunity Days in 2022, there have been

- 15 Opportunity Day events
- 41 thought leader presentations
- 1300+ participants

During this fiscal year, OFRN's hosted four virtual Opportunity Days that had over 425 attendees from industry, government, and academia. Thought leaders from AFRL, NAMRU-D, NASA GRC, America Makes, Miami University, Ohio Innovation Exchange, The Ohio State University, and Parallax Advanced Research presented topics such as Quantum, Ohio Federal Partners Updates, Space, and Advanced Manufacturing.

Celebrate Ohio!

On March 25, leaders from government, academia, and industry came together at the Ohio Statehouse not just to reflect, but to highlight the future of research and innovation in Ohio. ***Celebrate Ohio!,*** hosted by the OFRN, showcased cutting-edge technologies and partnerships that are driving economic growth, national defense innovation, and research excellence. The event brought attention to *OFRN*'s critical role in connecting institutions and catalyzing impact across Ohio.



Figure 15: AsterTech at Celebrate Ohio!

From Groundbreaking Research to Real-World Impact. The event highlighted the new Round 7 OFRN-funded projects (Figure 15), as well as projects from previous rounds 5 and 6. The teams presented their technologies to an audience that included members of the Ohio Legislature, federal partners, academia, and representatives from ODHE, JobsOhio, and the Governor's Office. Table displays highlighted innovations from Ohio's universities, small businesses, and research institutions. The featured speakers from government, academia, and industry emphasized how public-private-academic partnerships are strengthening the state's national and global competitiveness.

Featured Speakers:

- **Jim Bennett**, Chief of Staff and Senior Policy Advisor, Ohio Department of Higher Education
- **Dr. Gregory Crawford**, President, Miami University
- **Brian McJilton**, Director, AFRL Small Business Program Office, Air Force Research Laboratory
- **Ashlie Flegel,** Acting Director, Technology Integration and Partnerships, NASA GRC
- **Dr. Rajesh Naik**, Mined XAI – Round 7 project: REACT-X: Resilient Explainable AI for Casualty Triage with Logistics Awareness Using Deep Topological Modeling
- **William McAuley**, OSU Graduate Student Intern from Round 6 project Structural Materials Joining in Space (Figure 16)
- **Maj. Gen. Mark Bartman (Ret.)**, Executive Director, *OFRN*



Figure 16: Will McAuley at Celebrate Ohio!

A Hub for Connections—And Growth

Many attendees spoke about OFRN's success in convening the right people at the right time to drive innovation. The project teams present shared how their collaborations, supported by OFRN funding, have already opened doors for additional research, commercialization opportunities, and continued federal partnerships.

Outreach – Event Participation

National Advanced Air Mobility Industry Forum (October 14-15, 2025) was an event hosted by the Dayton Development Coalition (DDC) at the Springfield-Beckley Municipal Airport. OFRN in partnership with Parallax Advanced Research and the Ohio Aerospace institute was a sponsor of the event. The event featured exhibits from a variety of AAM industry members, flight demonstrations, static displays, speakers and panelists, and eVTOL and UAV aircraft, manufacturers, and suppliers.

2026 State of Tech (February 12, 2026) This was the third annual OhioX State of Tech event and was held in Columbus, Ohio. OFRN/Parallax Advanced Research was a sponsor of this event that offered participants a prime opportunity to connect with key leaders in Ohio's technology sector, gain insights into the latest developments, and hear exciting plans for 2026 and beyond. Participants had the chance to network and build relationships with tech-focused leaders and professionals from across Ohio. The symposium featured a keynote from Deloitte Consulting about Closing the AI Gap – from hype to high-impact outcomes, a panel discussion by Ohio Senator Michele Reynolds, and Ohio Representatives David Thomas and Melanie Miller. on Ohio's next chapter – innovation, policy, and the year ahead.

Partnerships

"OFRN is strengthening the relationship we have with the other federal partners along with academia and industry and developing the innovations and doing the research and development statewide."

Ashlie Flegel Acting Director, Technology Integration and Partnerships, NASA GRC.

Ohio Air Mobility Exchange (OAMx) formerly known as the Ohio Air Mobility Symposium (February 26, 2026). This student-organized event was held at The Ohio State University campus. The annual event highlights Ohio's ongoing commitment to advancing air mobility. The goal of the event was to engage and connect Oho State students with the growing advanced air mobility industry. This year's event featured a specialized workshop lead by an OFRN project industry partner Kairos Research. Kairos conducted the Human-Autonomy Teaming (HAT) workshop for approximately 25 Ohio State Engineering undergraduate students Developed and delivered in collaboration with Adithya Ramaswami (Parawave) and supported by Parallax. The workshop:

- Provided students with exposure to emerging challenges in human-autonomy collaboration
- Presented real-world applications in the Advanced Air Mobility (AAM) domain
- Discussed career-relevant problems at the intersection of engineering, autonomy, and human factors
- Facilitated hands-on learning through interactive group activities Engaged students in scenario-based exercises addressing HAT challenges
- Encouraged collaborative problem solving and discussion of future autonomy technologies

In addition to formal panels and exhibits, OFRN was also represented by Maj Gen (Ret) Mark Bartman throughout the fiscal year at the following events:

<u>July 25</u>

- Quantum Meeting with IBM, AFRL, JobsOhio
- AFWERX SBIR/STTR Meeting
- OFRN ERB R7

August 25
- 2025 Workforce Summit - Ohio Chamber of Commerce
- Live Demo of FlightProfiler LAWN project for OFRN
- OFRN Opportunity Day – Ohio Federal Partners Updates
- Quantum Strategy Meeting with IBM, AFRL, JobsOhio, ODOD, Ohio X

Sep 25
- Defense New Conference
- American Astronomical Society - Glen Chapter, Space Technology Symposium OFRN Panel Presentation at CWRU
- OFRN #625 Project Demo at Ohio University
- Ohio Cyber Collaboration Committee Quarterly Meeting
- USCYBERCOM Symposium in DC

Oct 25
- Ohio Cyber Range Institute (OCRI) Symposium at UC
- National AAM Industry Forum (NAAMIF) Conference at National Advanced Air Mobility Center of Excellence (NAAMCE) (Springfield)
- National Security Simulation participant at OSU for the Glen College and the Moritz College of Law
- 24th Annual Information Assurance (IA) Forum: Autonomous Mobility

Nov 25
- Quantum Meeting with members of the Ohio Legislature
- Institute for Cybersecurity and Digital Trust (ICDT) All-hands meeting at OSU
- ICDT Strategic Advisory Board Meeting at OSU
- 2025 CyberOhio Summit
- OFRN Opportunity Day - Quantum

Dec 25
- ODHE update brief on R7
- Institute for Cybersecurity and Digital Trust (ICDT) Advisory Board meeting at OSU

Jan 26
- Ohio Innovation Exchange Informational meeting
- Ohio Cyber Range Institute (OCRI) Executive Committee Meeting
- JobsOhio Meeting with OAI and OFRN
- Ohio Cyber Range Institute (OCRI) Quarterly Advisory Board Meeting
- Ohio X Annual Leadership Meeting
- American Institute of Aeronautics and Astronautics (AIAA) Space Systems Modernization Webinar

February 26
- Senior Leader Forum with Ohio National Guard
- OFRN Opportunity Day - Space
- Ohio X State of Technology Summit
- Ohio House Workforce and Higher Ed Committee meeting
- Defense Innovation OnRamp: Ohio briefing on AI for Small Business
- Ohio House Technology and Innovation Committee Meeting

March 26
- Ohio House Workforce and Higher Ed Committee meeting
- Ohio House Technology and Innovation Committee Meeting
- Ohio Cyber Collaboration Committee Meeting

- ICDT All-hands Meeting
- Orbit Ohio Spring ’26 Roundtable
- OFRN Celebrate Ohio!

April 26

- Keystone Space Working Group
- Parallax Technical Advisory Committee Brief on OFRN
- OCRI Advisory Board Meeting

May 26

- Kent State University CAE Advisory Committee Meeting
- 2026 Ohio CEO Summit - Ohio Chamber of Commerce
- AFRL Strategic Exchange - Classified Session
- 5th Annual Ohio Technology Summit
- OFRN Opportunity Day – Advanced Manufacturing

June 26

- Keystone Space Working Group Session
- Parallax Board Meetings & OFRN Brief

Workforce Development

The Student Experiential Engagement Experience (SEE), Figure 17, was first introduced with the Round 5 projects and continued in the Round 6 and Round 7 projects. This workforce development tool required the teams to incorporate students into both the R&D development as well as the business aspects of the project. The Student Experiential Engagement (SEE) program included STEM students ranged from undergraduate to post- graduate researchers.



Round	Total	Ph.D.	Masters	Undergrad
7	49	14	14	21
6	84	15	12	57
5	95	13	24	58
Total	228	42	50	136

Figure 17: OFRN SEE Components and Participation

The SEE has had student interns from:

- Air Force Institute of Technology (AFIT)
- Bowling Green State University
- Case Western Reserve University
- Central State University
- Cleveland State University
- Denison University
- Kent State University
- Miami University
- Ohio University
- The Ohio State University
- Sinclair Community College
- University of Akron
- University of Dayton
- University of Toledo
- Wright State University
- Youngstown State University

Students gained hands on experience during their internships. Rather than limiting students to observing research, the SEE program integrates the students into multidisciplinary teams where they collaborate across academic, industry and government organizations while developing both technical expertise and

professional skills including mentorship. Mentorship reflects one of the SEE Program's defining strengths. Some examples of hands-on experience include (Figure 18):



Figure 18: Julian Sewell building one of the project experiments

- The Ohio State University project 718 "Photonic Interfaces for Atom-based Quantum Processors" graduate and undergraduate students are contributing directly to cutting-edge quantum research, gaining experience that extends well beyond that classroom and into Ohio's growing innovation ecosystem. PhD student Julian Sewell's learned advanced optical fiber technologies, collaborated with experienced researchers and toured the laboratories of industry partners to better understand how quantum technologies move beyond academia. His role evolved beyond conducting research. He also spent a lot of time mentoring undergraduate students.
- The Ohio State University project 716 "Space GUIDE" brings together researchers from Ohio State, the Air Force Institute of Technology (*AFIT*), Air Force Research Laboratory (*AFRL*), SK Infrared, and SenseICs, the project aims to create a new class of sensor technology capable of detecting and tracking space objects more efficiently than current systems. This project is preparing Ohio's future space workforce. Researchers are currently engaging six to seven students across Ohio State and *AFIT* in areas ranging from detector material development and device design to electronics integration and testing. For these students, the project provides hands-on experience working at the intersection of national security, advanced manufacturing, and commercial space technology.
- Laser Fusion Solutions project 724 "Joining of OD Additive Materials" has students driving innovation throughout the project. The project was crafted so that it was student-run with expert supervision. Students are embedded in every stage of the process—from raw material development to final testing—gaining exposure that typically takes years to accumulate in industry. For Isaac Groeger, if meant finding out that he liked working with his hands which let him to pursue electromechanical engineering – combining technical problem-volving with hands-on work. Now, through the OFRN project, he's applying those skills in a real-world, high-stakes environment. His day-to-day work involves reconfiguring advanced manufacturing machines, installing new control systems, integrating software, and enabling real-time data collection to monitor and adjust metal 3D printing processes.

One aspect of the Student Experiential Engagement Experience (SEE) program was to support the employment of students in Ohio industry post-graduation, and to keep the top talent that our higher education system produces in Ohio. Examples of this are:

- Asymmetric project 528: This project supported five interns resulting in three full-time hires at Asymmetric including Jeremy Browne (Mechanical Engineering) and Joel Harrison (Computer Science/Software Engineering) from Ohio University, and Caleb Hawley (Mechanical Engineering) from The Ohio State University.
- FlightProfiler project 502: One student hired as full-time employee.
- AlphaMicron project 529: Jacob Huff, a student intern for the project, stayed in Ohio after graduation. He

Partnerships

"GE Aerospace appreciates the opportunity to support Ohio Federal labs by participating in University/Industry teams to solve federal lab needs. In particular, GE appreciates OFRN's mission to create potential employees for both the Federal Labs and for Ohio Industries."

Eli Alban
GE Aerospace

was hired as an electrical product engineer by Aptiv, located in Warren Ohio, where he models and designs automotive, solid state electrical centers.

- Safran project 550: Two students were hired as full-time employees. Both completed multiple co-op rotations, taking on increasing levels of responsibility. Today, they support industrialization and design efforts for new product development at the Twinsburg facility.

Why it matters for Ohio – and beyond. The implications go beyond a single project. By combining research, workforce development, and industry collaboration, OFRN is helping companies:

- Advance new technologies
- Explore new markets
- And build the skilled workforce needed to sustain both.

Improved Processes

Through state-wide engagement with our stakeholders, we are committed to continuous improvement and have continued to identify and make improvements throughout the fiscal year to continue to satisfy the need for increased transparency and engagement. We continued with the quarterly OFRN Opportunity Days, in part, to provide consistent public-facing engagement.

Round 7 Solicitation - FY26 Timeline

The OFRN Round 7 Solicitation was released on February 4, 2025, with a pre-release on December 27, 2024. The solicitation process concluded in FY26.

OFRN received 47 proposals. Below is a timeline of the RFP process during FY26.

- July 31, 2025 – Executive Review Board (ERB) met in person. TRC chair presented award recommendations for approval. Seven proposals were approved – one representing each Area of Interest (AOI)
- August 5, 2025 - Award projects and contracting process began.
- November 4, 2025 – Round 7 projects formally kicked off.

Appendix 2: Round 6 Projects (updated results)

Hypersonics: Gradient Alloy Processing in Laser Powder Bed Fusion for Hypersonic Applications	
OFRN Project Number: 625	**Status:** Completed
Project Start: 10/29/2023	**Projected Project End:** 6/30/2025
Current TRL: 5	**Total Jobs Created:** 4
Total Follow-on Funding: $1,200,000	**Total Cost Match:** $110,649
Lead: ARCTOS Technology Solutions	**Federal Partner:** NASA GRC
Team: Ohio University, University of Toledo, GoHypersonic Inc., Hyphen Innovations	

Project Description (Figure 19): This project will create gradient alloy parts with advanced laser powder bed fusion for hypersonic vehicles. The effort will develop and validate specific processes for multi-material deposition, focused on real-world applications. The focus and objective of the effort will be to build parts for hypersonic devices with a thin shielding layer of refractory metal. This project is designed to advance the state of the art in multi-material deposition for hypersonic applications and simultaneously drive expertise in multi-material solutions at Ohio universities.

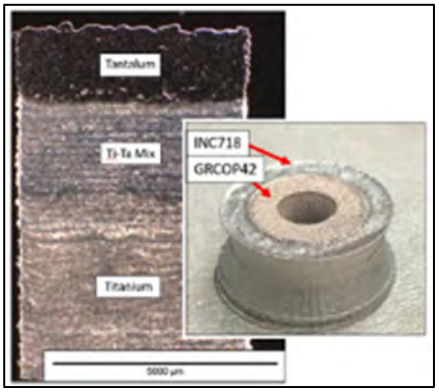


Figure 19: Gradient Alloy Processing

Results to Date: ARCTOS designed and installed multi-hopper powder deposition systems specific to LPBF AM printers1 at Ohio University (OU) and University of Toledo (UT). The schools then printed, tested and characterized-various coupons and tensile bars of the 17-4SS, In718, and TNIA alloys, and their mixtures. With this data GoHypersonic, Inc. (GHI) modeled and designed representative HS LE parts to be built by the universities and then evaluated by GHI in a thermomechanical test rig of their own design. In practice, both Ohio universities were able to collect valuable data on the as-printed alloys and their mixtures, and OU was able to print two example LE parts with different styles of transition between the high-temperature (In718) and high-strength (17-4SS) regions of the part. UT was able to create graded test coupons but could not complete full LE parts from TNIA to In718. Due to complications during the building process, not related to the transition region, the OU parts could not be fully evaluated on GHI's rig.

Impact on Ohio: The execution of the project impacted the State by establishing competence in GAP methodology at two Ohio universities at a key moment for the development of this technology of critical interest to Defense and Ohio's major Federal institutions. The project created 4 and retained 3 jobs across the team, and set several students, via co-ops and internships, on the path of working in these areas. $1.2M in follow-on funding was secured during the project and an additional $3-5M is projected.

Human Performance: Ocular and Physio-Temporal Indicators for Cognitive State (OPTICS)	
OFRN Project Number: 624	**Status:** Completed
Project Start: 10/29/2023	**Projected Project End:** 6/30/2025
Current TRL: 6	**Total Jobs Created:** 3
Total Follow-on Funding: $1,350,397	**Total Cost Match:** $912,908
Lead: Kairos Research LLC	**Federal Partner:** AFRL, NAMRU-D
Team: Sinclair Community College, Wright State University, The Entrepreneurs' Center	

Project Description (Figure 20): This project seeks to:

- Develop and demonstrate *real-time algorithms* that analyze eye movements and other physiological indicators to identify and predict *cognitive states* related to impending loss of consciousness and/or incapacitation (such as fatigue, drowsiness, and loss of vigilance)
- Develop a *real-time dashboard visualization tool* that allows for monitoring of ocular/physiological data and associated cognitive states and that provides *alerts* when an operator has entered a sub-optimal cognitive state (e.g., fatigue state)



Figure 20: Experimental Setup In AFRL Lab To Study Fatigue In Long-Haul Flight Tasks

Results to Date: OPTICS developed a TRL6 prototype real-time fatigue detection system using eye-tracking and physiological indicators. The system achieved effective predictive performance (AUC =0.78) through a computationally inexpensive machine learning approach and featured a configurable dashboard to provide continuous monitoring and timely intervention alerts, facilitating operator performance and mission effectiveness. The OPTICS system successfully integrates commercial-off-the shelf sensors through open-source frameworks, enabling deployment across different operational contexts while maintaining cost-effective scalability for widespread use.

Impact on Ohio: Intellectual property development is underway with provisional patent applications planned for our fatigue detection methodology and integrated sensor-to-dashboard architecture. Through collaboration with Ohio federal partners, the project strengthened Ohio's position in human performance monitoring and cognitive state analytics research.

High Power Energy Conversion: High Bandwidth Light Weight Modular GaN Based Utility Interactive DC Emulator	
OFRN Project Number: 619	**Status:** Completed.
Project Start: 10/29/2023	**Projected Project End:** 6/30/2025
Current TRL: 4	**Total Jobs Created:** 0
Total Follow-on Funding: $3,119,000	**Total Cost Match:** $434,871
Lead: University of Akron	**Federal Partner:** AFRL, NASA GRC
Team: Case Western Reserve University, PC Krause & Associates	

Project Description (Figure 21): This project proposes to develop a lightweight, compact, high-bandwidth DC emulator for Digital Engineering Systems. A Direct Current Emulator (DCE) that can operate as a programmable DC power supply (source) and a DC load (sink) is of particular interest to many electrical system Hardware-In-the-Loop (HIL) applications, such as avionics, automotive, and space power. To meet the requirements of a DCE for these HIL applications, we are proposing the development of a modular and scalable high bandwidth bidirectional DCE that uses a novel parallel interleaved GaN-based DC/DC Dual Active Bridge (DAB) converter topology as the basic building block of the DCE.

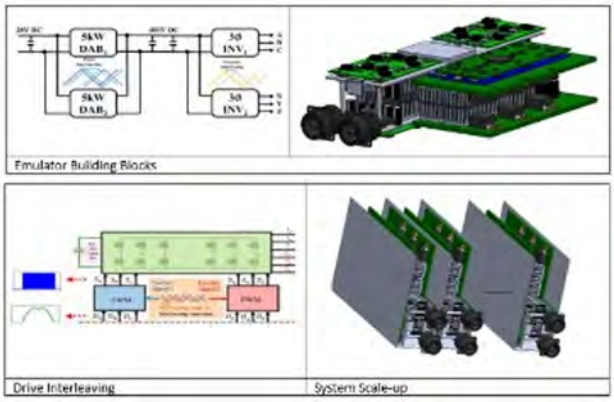


Figure 21: Project 619 Technical Concept and Approach

Results to Date: All promised tasks and milestones have been successfully delivered. The project team has designed, built and demonstrated the operation of two 5 kW Dc Emulator synthesizing 5 kHz waveforms for bi-directional power flow. Throughout the duration of the project, the team concentrated on broadening the implementation of DAB converters in a variety of sectors. A notable application included integrating the converter with a three-phase inverter, specifically designed to enhance motor drive operations in UAVs. This innovative approach has led to the development of a high-performance 10 kW electric machine drive tailored for UAV applications. This achievement enabled the establishment of a startup company, Star Phase Technologies which will be utilized to commercialize the modified emulator.

Another application involves utilizing the converter for energy mapping of battery packs in electric vehicle (EV) applications, which could also be adapted for aerospace purposes.

Impact on Ohio: A provisional patent has been submitted for this aspect of the converter's use. The Project team received new industry and federal funding. The most prominent one is the US DOE ARPA-E funding from the recent Vision program for $2.3M.

Digital Engineering Tools: A Machine Learning Framework for Digital Engineering of Hypersonic Vehicles with Quantified Prediction Uncertainty (Hypersonic ML FW)	
OFRN Project Number: 628	**Status:** Completed
Project Start: 10/29/2023	**Projected Project End:** 6/30/2025
Current TRL: 5	**Total Jobs Created:** 5.5
Total Follow-on Funding: $5,599,000	**Total Cost Match:** $171,917
Lead: CFD Research	**Federal Partner:** AFRL
Team: Air Force Institute of Technology (AFIT), Wright State University, Dr. Bill Oberkampf	

Project Description (Figure 22): This project will implement a machine learning framework for digital engineering of hypersonic vehicles with quantified prediction uncertainty. The framework will integrate model-based system engineering (MBSE) concepts; physics-based modeling; and machine learning within a software framework for advanced hypersonic vehicles. In combination, these capabilities will enable digital representation of hypersonic systems with quantified uncertainty metrics that can be provided to decision makers.

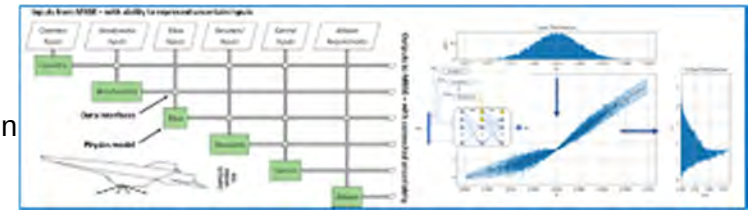


Figure 22: Project 628 Technical Concept and Approach

Results to Date: The project is progressing: the initial model structure was drafted; aero and aerothermal data generation workflows were established; and E2NN model was built for aerodynamic data. The project has created a prototype for each of the following: ML Hypersonic Framework; Surrogate models for SRQs; and MBSE Integration Models. The OFRN effort afforded the opportunity to pursue digital engineering technology focused on uncertainty quantification. Under the effort we were able to implement a first-of-its-kind framework which directly coupled system engineering models with modeling and simulation tools to provide interactive assessment of system performance with quantified uncertainty. Further, we utilized machine learning techniques in the form of surrogate models to provide the assessment more rapidly. Under the effort we demonstrated the uncertainty quantification for a hypersonic vehicle.

Impact on Ohio: The present OFRN effort led to direct creation of two full-time roles for a pair of engineers at CFD Research Corporation. Over the course of the project, we actively pursued multiple opportunities to build upon the capability developed in the present effort and its constituent technologies. The technology and expertise developed under the OFRN effort contributed to our ability to pursue, and ultimately obtain, projects with the Department of Defense. $2.38M of additional funding has created five jobs for our office in Dayton.

The OFRN effort afforded the opportunity to pursue digital engineering technology focused on uncertainty quantification. Under the effort we were able to implement a first-of-its-kind framework which directly coupled system engineering models with modeling and simulation tools to provide interactive assessment of system performance with quantified uncertainty. Further, we utilized machine learning techniques in the form of surrogate models to provide the assessment more rapidly. In addition to the technical takeaways, the OFRN effort afforded opportunities to grow collaboration between CFD Research and multiple Ohio-based Universities. The professors at the Air Force Institute of Technology and Wright Statue University brought unique expertise to the effort. We have pursued follow-on efforts with these researchers, and we plan to look for future opportunities to collaborate. Finally, our team was able to meet regularly with AFRL/RQ personnel and their Digital Engineering Working Group. Technology transition discussions are ongoing with AFRL.

Commercial Space in Low Earth Orbit: Structural Materials Joining in Space	
OFRN Project Number: 609	**Status:** Completed
Project Start: 10/29/2023	**Projected Project End:** 6/30/2025
Current TRL: 3	**Total Jobs Created:** 13
Total Follow-on Funding: $3,252,999	**Total Cost Match:** $218,807
Lead: The Ohio State University	**Federal Partner:** AFRL, NASA GRC
Team: University of Dayton, Central State University, Agile Ultrasonics LCC, Lincoln Electric, IPG Photonics, Nanoracks, EWI	

Project Description (Figure 23): The project focuses on the understanding and quantification of the challenges associated with materials joining in space conditions. This work includes developing and using an autonomous welding system that reproduces the vacuum, temperature, and gravity conditions encountered during manufacturing, maintenance, and repair in space. This work will advance the technology readiness level (TRL) of laser beam welding (LBW) of metals and ultrasonic welding (UW) of thermoplastics and advanced composites under space conditions from a TRL 3 to TRL 5. An autonomous welding system will be implemented using a vacuum chamber currently under development by a multidisciplinary undergraduate Capstone team at The Ohio State University (OSU), which is co-sponsored by NASA and OSU. This unique facility will consist of a vacuum chamber integrated with heating/cooling systems, motion devices, controls, and a sensor array, which will enable LBW and UW operations. This system is designed for materials joining under space conditions, including LEO, Moon, and Mars gravity (via parabolic flights), extreme temperatures, and vacuum. As data collection is a critical component of the proposed work, a sensor array is integrated with the chamber to maximize the data gathered during welding. This data will be used for future modeling efforts that will reduce experimental costs and accelerate and de-risk technology development.

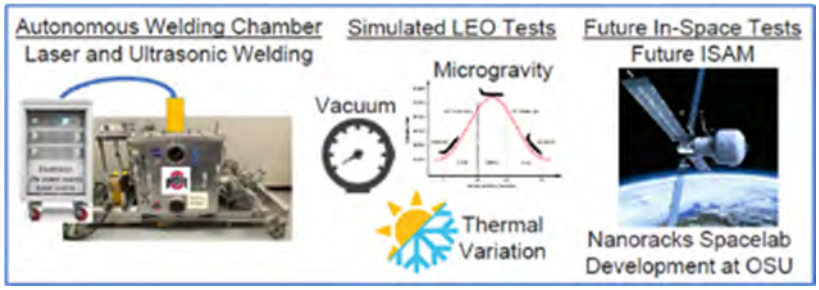


Figure 23: Project 609 Technical Concept and Approach

Results to Date:

- Instrumentation for simulating space conditions was complete and used to produce unique experimental data for welding in space conditions with a variety of materials.
- Startup company Fuse-X LLC spun out for welding in space and has already submitted a NASA SBIR proposal in collaboration with industry.
- Agile has product sales of $100,000.
- More SEE students are engaged than was originally planned.
- In discussion with Voyager, Nanoracks, Starlab, and Zin to manufacture system for ISS experiments.
- Built a network of NASA and AFRL collaborators and continue to expand this network.
- Met new potential industrial partners monthly

Impact on Ohio: The project helped establish Ohio as a national leader in ISAM technologies. It catalyzed more than $11M in potential follow-on funding from agencies, and contributed to partnerships with other companies like Nanoracks, Agile Ultrasonics, and Lincoln Electric. The work developed in this work will enable the development of a welding system intended for future deployment aboard the Starlab space station being developed in Columbus, OH. This places the state in the leadership position in space manufacturing.

Innovation

"OFRN enabled us to start work in laser welding in space, and we are now the leaders of this field in the US and the world."

Boyd Panton Assistant Professor, Welding Engineering Program, The Ohio State University

Quantum Sensing Technology: Quantum Sensor System using Rydberg Atoms	
OFRN Project Number: 602	**Status:** Completed
Project Start: 10/29/2023	**Projected Project End:** 6/30/2025
Current TRL: 4	**Total Jobs Created:** 2
Total Follow-on Funding: $380,000	**Total Cost Match:** $168,765
Lead: GhostWave	**Federal Partner:** AFRL and NASA
Team: The Ohio State University, University of Dayton Research Institute, Converge Technologies, Infleqtion	

Project Description (Figure 24): The objective of this project is to demonstrate the potential enhancements of GhostWave sensors by leveraging Rydberg atoms, operating at a lower noise floor, and delivering higher fidelity with innovative quantum hardware and software. Team GhostWave will demonstrate a quantum sensing system, based on the integration of Rydberg atom quantum RF electric field sensors with telecommunications band wavelength converters and RF noise radar systems. The team will quantitatively characterize system levels of quantum advantage from the integration of state-of-the-art quantum technology with state-of-the-art-classical technology. The team anticipates that the improved sensitivity of the quantum sensor will reduce system noise, thereby providing system level enhancement in dynamic range and fidelity. Wavelength conversion to the telecommunications band provides stand-off distance capability. The results have the potential to significantly impact application spaces of interest to the DoD.



Figure 24: Project 602 Technical Concept and Approach

Results to Date: Both the classical antenna (gain 3 dBi at 2.5 GHz) and Rydberg sensor successfully detected the GhostWave waveform and resulted in successful “detection” response from the processing FPGA system.

Impact to Ohio: Because of this project, the team was able to meet with Ohio legislature on advancing Quantum Sensors awareness in the state of Ohio. The team is pursuing follow-on funding to improve sensor SWAP and Ruggedization. Commercialization is still a few years away due to the TRL level. However, the team is engaged with AFRL and NASA.

Appendix 3: Round 7 Projects (year 1)

Hypersonics: HERCULES: Hypersonic Engineered Reusable Ceramic Ultra-Lightweight Enduring System	
OFRN Project Number: 738	**Status:** ongoing
Project Start: 10/1/2025	**Projected Project End:** 4/30/2027
Current TRL: 4	**Total Jobs Created:** 2
Total Follow-on Funding: $1,000,000	**Total Cost Match:** $289,735
Lead: AsterTech LLC (Dayton, OH)	**Federal Partner:** AFRL
Team: The Ohio State University, Cleveland State University	

Project Description (Figure 25): HERCULES is about addressing one of the core limitations of hypersonic vehicles — how to survive extreme heat repeatedly without throwing hardware away after each mission. HERCULES is developing a new class of ultra-high-temperature ceramic coatings designed specifically for reusable hypersonic systems. HERCULES is focused on developing coatings that can withstand temperatures above 3,000 degrees Celsius while remaining lightweight and durable. The goal is to enable reusable hypersonic vehicles that are more affordable, more reliable, and faster to return to service.



Figure 25: Project 738 Technical Concept and Approach

Results to Date: All four thrusts have a working capability in place:

- Knowledge platform (a queryable map of the field, built from the literature the program needs to consume)
- CFD simulation/thermal modeling (a verified simulation baseline for how coated composites respond to extreme heat)
- Precursor synthesis and scale path (standing up a domestic chemistry feedstream for the ceramic coatings)
- CVD/deposition (turning the precursor into a coating and learning the process map)

Impact on Ohio: The project highlights Ohio's growing role in hypersonics research and advanced manufacturing. The state combines Air Force research capabilities, major engineering universities, and a network of small and mid-sized aerospace companies. While defense hypersonics are the primary focus, the coatings developed under HERCULES could have broader applications. Potential uses include reusable space launch systems, rocket propulsion, advanced gas turbines, and other industrial environments that involve extreme heat and harsh conditions. By extending component life and reducing weight, the technology could improve efficiency and reduce costs across multiple sectors.

Shifting the hypersonics paradigm. If successful, HERCULES could help shift hypersonic systems from fragile, experimental platforms to reusable assets capable of sustained operations. With its focus on reusability, manufacturability and mission alignment, HERCULES represents a step toward making hypersonic flight a dependable tool rather than a one-time demonstration.

Health and Human Performance: REACT-X: Resilient Explainable AI for Casualty Triage with Logistics Awareness using Deep Topological Modeling	
OFRN Project Number: 740	**Status:** ongoing
Project Start: 10/1/2025	**Projected Project End:** 4/30/2027
Current TRL: 6	**Total Jobs Created:** 3
Total Follow-on Funding: $590,000	**Total Cost Match:** $62,780
Lead: Mined XAI	**Federal Partner:** AFRL, NAMRU-D, NASA GRC
Team: The Ohio State University, Wright State University	

Project Description (Figure 26): REACT-X introduces a predictive eXplainable Artificial Intelligence (XAI) platform that can change the future of battlefield medical triage, en route care, and medical logistics. By integrating multimodal datasets (physiologic signals, injury data, supply utilization records and other metadata), REACT-X provides a framework for identifying critical features to enable medics in resource-constrained, contested environments to triage casualty patients. The innovation lies in information extracted from multimodal datasets that provides XAI-enabled risk assessment, allowing frontline providers to optimize scarce medical supplies, identify patients at high risk of decompensation, and adjust treatment strategies. This dual-use approach leverages XAI and modular architectures, ensuring transparency, adaptability, and compatibility with existing government and commercial platforms.

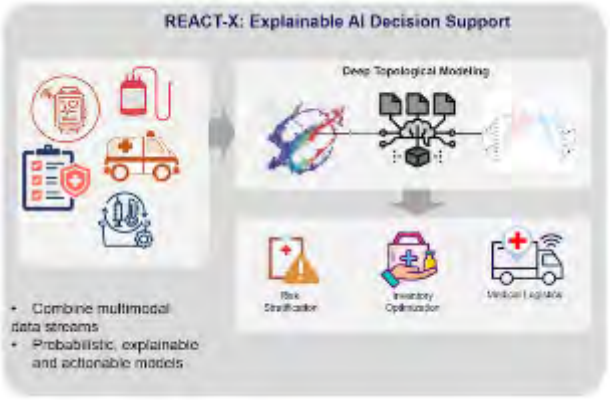


Figure 26: Project 740 Technical Concept and Approach

Results to Date: Completed modeling architecture that allows classification of car crash archetypes. Building an AIS Coding Bot.

Impact on Ohio: Although the project's primary focus is military survivability and readiness, its architecture supports dual-use applications. Because of the sensitive nature of military data, the team is currently using surrogate datasets — such as car crash data — to model injury severity and logistics needs.

In a civilian context, REACT-X could enhance 911 dispatch, emergency medical services routing and trauma center selection by combining vehicle telemetry, witness reports and on-scene assessments to predict injury severity and required interventions.
The system may also prove valuable in prolonged casualty care scenarios, rural emergency response, disaster relief operations and hospital emergency departments experiencing patient surges. By identifying which patients require immediate attention and which can safely wait, providers could improve outcomes while reducing cognitive burden during high-tempo operations.
Ultimately, the developers see REACT-X as a tool to increase survival rates by enabling earlier intervention, smarter resource allocation and more resilient decision-making under uncertainty.
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Aerospace Power Management, Materials, and Distribution: Gas-insulated Cable with Integrated Partial Discharge Detection for Aerospace Systems	
OFRN Project Number: 739	**Status:** ongoing
Project Start: 10/1/2025	**Projected Project End:** 5/30/2027
Current TRL: 6	**Total Jobs Created:** 9
Total Follow-on Funding: $3,087,999	**Total Cost Match:** $3,749
Lead: The Ohio State University	**Federal Partner:** AFRL, NASA GRC
Team: Miami University, Case Western Reserve University, GE Aerospace Research, GE Aerospace Electric Power	

Project Description (Figure 27): This project introduces a compressed-gas-insulated high-voltage cable system with integrated partial discharge (PD) smart detection capabilities. It leverages hybrid passive-active sensing circuits and a physics-informed neural network (PINN) for real-time PD detection and localization. The use of CO_2 as the primary insulation medium, combined with sensor-embedded smart connectors, represents a novel approach to improving reliability, safety, and altitude performance in aerospace power systems.

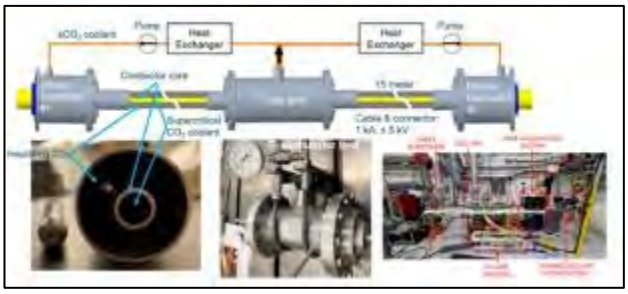


Figure 27: Project 739 Technical Concept and Approach

Results to Date: The project has moved from analysis and simulations to hardware design. The project has engaged a large group of undergraduate and graduate students.

Impact on Ohio: OSU in collaboration with GE Aerospace Research, Miami University, and Case Western University with in-kind support from Unison Industries and GE Aerospace Electric Power, will develop an advanced compressed-gas-insulated PD-resistant cabling system with a PD-smart connector physically embedded with multiple sensing mechanisms for comprehensive electrical insulation risk mitigation. This system aims to prevent PD occurrence and mitigate damage associated with PD for electrical systems on both military and commercial aircraft.

Commercial Space in Low Earth Orbit: Space GUIDE: Spaceborne Gain-enabled Ultra-sensitive Infrared Detector with Event-based Sensing	
OFRN Project Number: 716	**Status:** ongoing
Project Start: 10/1/2025	**Projected Project End:** 5/30/2027
Current TRL: 4	**Total Jobs Created:** 3
Total Follow-on Funding: $250,000	**Total Cost Match:** $66,917
Lead: The Ohio State University	**Federal Partner:** AFRL
Team: Air Force Institute of Technology (AFIT), SK Infrared, SenseICs	



Figure 28: Project 716 Technical Concept and Approach

Project Description (Figure 28): This effort will address the needs of federal research partners at the Air Force Research Laboratory's (AFRL) Sensors and Space Vehicles Directorates, the Naval Post Graduate School (NPS), and the commercial space industry by demonstrating a path for high-performance sensors that can provide real-time space domain awareness SDA catalog updates and RSO tracking using a constellation of on-orbit sensors. The project combines foundational research from Ohio's universities with the engineering expertise of industry and the operational insight of federal laboratories. Ohio State and AFIT provide expertise in infrared detector materials and event-based sensing architecture. SK Infrared is developing next-generation infrared detector components, while SenseICs contributes advanced electronic circuitry and sensor integration capabilities. AFRL helps define performance requirements and validates pathways toward operational adoption and commercialization. The partnership is designed not only to advance a breakthrough technology, but also to accelerate its transition from laboratory research to real-world deployment. Success for the Space GUIDE team will be measured by a planned demonstration of the technology within an optical telescope system at AFIT. If successful, the project could pave the way for commercialization efforts with larger optical device manufacturers and future collaborations with Air Force and Space Force stakeholders.

Results to Date: Technical: Completed Pathfinder design and initiated fabrication.

- Defined detector specifications to support ROIC design (OSI/SKI/SenseICS).
- Designed/grew/characterized SWIR detector materials (OSU/SKI)
- Completed surrogate fanout integration with ROIC (SenseICS, SKI)
- Specified optical telescope, dewar cooler need (AFIT/SenseICS/SKI)
- Determined that the project is addressing the Federal sponsor's needs.

Impact on Ohio: The project's impact extends beyond technology development. The project is also preparing Ohio's future space workforce. Researchers are currently engaging six to seven students across Ohio State and AFIT in areas ranging from detector material development and device design to electronics integration and testing. For these students, the project provides hands-on experience working at the intersection of national security, advanced manufacturing, and commercial space technology. It also creates opportunities for Ohio-based small businesses to establish themselves as contributors to the rapidly growing space economy. This project represents another example of Ohio's growing role in advancing technologies that support both national security and commercial innovation. As the space domain becomes more crowded, complex, and strategically important, Ohio researchers are working to ensure the nation can continue to see clearly—and act decisively—among the thousands of objects orbiting overhead.

Quantum Technologies: Photonic Interfaces for Atom-based Quantum Processors	
OFRN Project Number: 718	**Status:** ongoing
Project Start: 10/1/2025	**Projected Project End:** 5/30/2027
Current TRL: 6	**Total Jobs Created:** 10
Total Follow-on Funding: $450,000	**Total Cost Match:** $156,163
Lead: The Ohio State University	**Federal Partner:** AFRL, NASA GRC
Team: Denison University, SRICO, Inc.	

Project Description (Figure 29): This project seeks to create a quantum network of atom-based quantum processors. This requires compact photonic integration with atomic qubits at the single photon level. This project will develop and test optical fiber microcavities to meet this challenge.

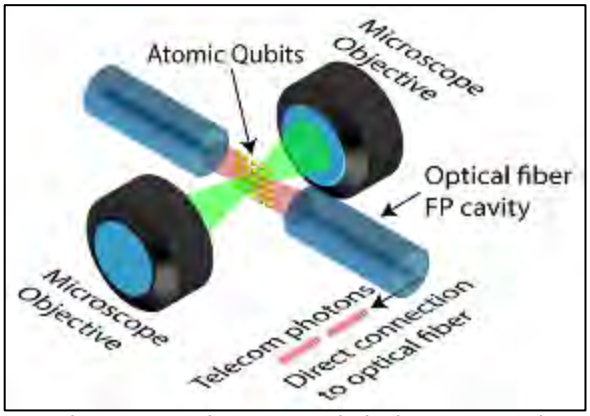


Figure 29: Project 718 Technical Concept and Approach

Results to Date:

- Established manufacturing process for fiber-based mirror cavities
- Designed Vacuum-compatible Fabry-Perot fiber cavities mounts for neutral atoms and trapped ions
- Primary goal is to optically coat the mirrors and test the performance of the cavities and reflection coatings for quantum networking applications.
- A stable and reliable manufacturing pipeline for producing FPFCs has been completed. We are now able to controllably adjust the diameter of the radius of curvature of the FPFCs to match the design criteria for the trapped ion and neutral atom set-ups.

Impact on Ohio:

- Developing a large research network within Ohio
- Developing an experimental apparatus and platform with OFRN support that will be crucial for future successful proposals over the next decade
- Creating a quantum network in Ohio (figure 30)
- OSU CQISE and Ohio Academic Resources Network (OARNET) Optical fiber link established for quantum-enabled cybersecurity and quantum communication testing
- This project aims to develop new photonic technologies with SRICO Inc. These products will be made available on the market. These devices are crucial components for developers of quantum networking technology who together form a large customer base within academia, industry and government.

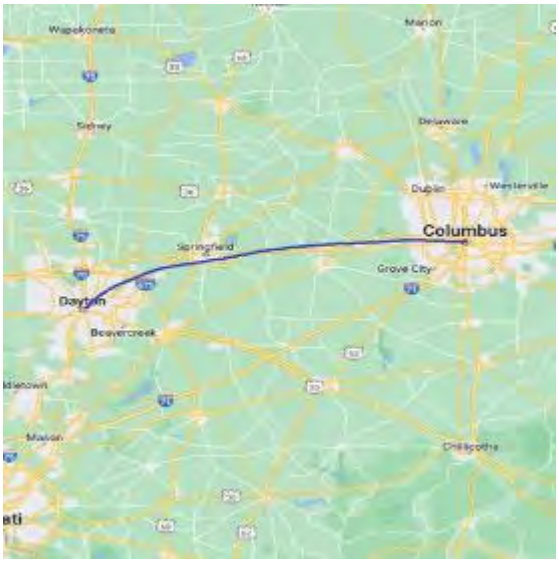


Figure 30: Creating a quantum network from Dayton to Columbus

Autonomy: VISTA: Validated Indicators for Selective Trust in Autonomy	
OFRN Project Number: 736	**Status:** ongoing
Project Start: 10/1/2025	**Projected Project End:** 4/30/2027
Current TRL: 3	**Total Jobs Created:** 0
Total Follow-on Funding: $553,000	**Total Cost Match:** $394,442
Lead: Kairos Research LLC	**Federal Partner:** AFRL
Team: Wright State University, Sinclair Community College, The Dayton Entrepreneur Center	

Project Description (Figure 31): VISTA seeks to:

- Develop scientifically grounded algorithms to accurately assess and rapidly calibrate bi-directional trust in human-anatomy teams (HATs) by aligning latent representations and sharing critical knowledge in an adaptive interface;
- Iteratively design, develop, and test our trust calibration interface in a realistic dual-use scenario involving a human-operated Advanced Air Mobility (AAM) platform coordinating with multiple autonomous UAS to perform complex missions.



Figure 31: Project 736 Technical Concept and Approach

VISTA's operator-defined trust metrics leverage research on expert decision models to optimally fuse inputs from human experts to create dynamic, interpretable measures of machine trustworthiness. Bi-directional trust is achieved by integrating real-time assessments of the human operator's cognitive state, utilizing and expanding on algorithms developed under Kairos's OFRN Round 6 OPTICS project. Additionally, we will leverage our access to Sinclair's specially configured Beta *AAM* flight simulator, serving as VISTA's experimental platform, to develop, test, and evaluate the VISTA UAS Adaptive Trust Interface.

Results to Date: The project is on schedule and has accomplished the following:

- Implemented final scenarios for data collection
- Updated Dashboard with automation reliability features
- Designed and refined additional cognitive models
- Implemented experimental design

Impact on Ohio: VISTA interns will be exposed to the diverse problem sets and operational needs of our government customers and will become acquainted with the performance demands of DoD-funded applied research (including fast-paced schedules with a focus on quantifiable milestones and deliverables). Interns will gain invaluable professional experience and establish important contacts with researchers—relationships that put them on the radar of potential future employers and enhance the likelihood of keeping skilled talent within Ohio.

Advanced Materials Technology – Critical Materials Supply for Aerospace: Joining of ODS Additive Materials	
OFRN Project Number: 724	**Status:** ongoing
Project Start: 10/1/2025	**Projected Project End:** 4/30/2027
Current TRL: 4	**Total Jobs Created:** 2
Total Follow-on Funding: $225,000	**Total Cost Match:** $87,432
Lead: Laser Fusion Solutions LLC	**Federal Partner:** AFRL, NASA GRC
Team: The Ohio State University, Wright State University, Hyphen Innovations, Powder Alloy Corporation, North American Manufacturing Pros	



Figure 32: Project 724 Technical Concept and Approach

Project Description (Figure 32): This proposal combines the leading experts on one specific ODS material of interest (GRX-810) and the leading experts in advanced welding technologies. The team will advance the technology readiness level of the material by utilizing advanced sensing capabilities combined with the LPBF and advanced welding equipment. This will allow the team to track the cooling rates of the material and ensure the welding methods are successful. The team is proposing to use laser beam welding (LBW), friction stir welding (FSW), and cryogenically cooled welding to join the material together. It is anticipated that different welding techniques will be required for different types of welding. By utilizing these techniques, the team will be able to control the cooling rates and successfully join the material.

The project objectives are to:

- Identify the required cooling rates for the material via advanced sensor technologies and metallurgical inspection.
- Identify the optimal methodologies for welding the material together.
- Develop an initial database of mechanical information on the welded GRX-810 material.

Results to Date: Initial welding trails are underway. Sample preparation method is almost complete. The project is going well, and students are gaining valuable experience through hands on methods.

Impact on Ohio: The project leverages Ohio's advanced manufacturing ecosystem, creating high-skill jobs and positioning Ohio-based companies and universities at the forefront of next-generation aerospace materials joining.

The project is supporting OSU and WSU graduate researchers and retaining 2 LFS technical FTEs. A validated ODS welding capability positions Ohio as the national hub for this emerging process — with 2 additional engineering hires projected upon commercialization.

Appendix 4: Partners

Federal Government

1. Air Force ResearchLaboratory
2. NASA Glenn
3. National Air and Space Intelligence Center
4. Naval Medical Research Unit-Dayton
5. Ohio National Guard

Federal & State Collaborators

1. Air Force Material Command
2. Ohio National Guard
3. Ohio Department of Transportation
4. Ohio Department of Development
5. Ohio Innovation Fund
6. Ohio Academy of Science
7. Ohio Space Grant Consortium
8. Ohio Aerospace Institute

Academic Collaborators

1. Air Force Institute ofTechnology
2. Bowling Green State University
3. Case Western ReserveUniversity
4. Cedarville University
5. Central State University
6. Clark State CommunityCollege
7. Cleveland State University
8. Denison University
9. Heidelberg University
10. Kent State University
11. Lorain County Community College
12. Miami University
13. North Central State College
14. Ohio University
15. Otterbein University
16. Sinclair Community College
17. The Ohio State University
18. The University of Akron
19. The University of Cincinnati
20. The University of Dayton
21. The University of Findlay
22. The University of Toledo
23. Wilberforce University
24. Wright State University
25. Youngstown State University

Industry Collaborators

1. AAB
2. Advanced TeleSensors
3. AEP
4. Agile Ultrasonics LLC
5. Akron Polymer Systems
6. Akron Polymers
7. AlphaMicron
8. Americarb
9. Amperand
10. ARCTOS Technology Solutions
11. AsterTech LLC
12. Asymmetric Technologies
13. Autonodyne/Avidyne
14. Battelle Memorial Institute
15. Berriehill Corp
16. Bertec Corporation
17. Bosma Technology
18. Broadline Capital
19. CAL Analytics
20. CAR Technologies
21. Caterpillar
22. CFD Research
23. Cincinnati Inc.
24. Columbus Collaboratory
25. Comsat Architects
26. Converge Technologies
27. CRG
28. Crown Equipment
29. CSA America
30. DataScience.com
31. Dayton Childrens
32. DelphicDB
33. Demeter UAVs
34. DesignKnowledge
35. Eaton
36. Eccrine Systems, Inc
37. Electrodyne
38. EMS Adhesives
39. The Entrepreneur's Center
40. Event 38 Unmanned Systems
41. Fenix Magnetics
42. FlightProfiler
43. Ford
44. Galois
45. GE Aerospace Research
46. GE Aviation
47. GE EPIS Center
48. General Dynamics
49. GhostWave Inc.
50. GIRD Systems Inc.
51. GoHypersonic
52. Gooch & Housego Ohio
53. GrafTech
54. Hana Microdisplay Systems
55. Hewlett Packard
56. Honeywell
57. Hyphen Innovations
58. Illumination Works
59. Infleqtion
60. Innovative Scientific Solutions, Inc.
61. Inorganic Specialist Materials
62. Ipsos
63. IS4S
64. Kairos Research LLC
65. KeyW Corp
66. Kongsberg Geospatial
67. Lexis Nexis
68. L3Harris Space & Sensors
69. Lincoln Electric
70. Lockheed Martin
71. Lockheed Martin Procerus
72. Lockheed Martin Rotary &Mission Systems
73. Lubrizol
74. Lucintech
75. MacAir Aviation
76. MacNauchtan Development
77. MatchTx
78. Meggitt
79. Mined XAI
80. Nanoracks
81. NONA Composites
82. Norman Noble
83. North American Manufacturing Pros
84. Nuance
85. Orbital Research
86. Orbital-ATK
87. Parker Hannifin
88. PC Krause & Associates
89. Perduco
90. Persistent Surveillance Systems
91. pH Matter
92. Powder Alloy Corporation
93. Powdermet
94. Power Converters Future
95. Premier Health
96. Resilient and Secure UAS Flight Control
97. ResilienX
98. Riverside Research
99. Rubix
100. Safran
101. SenseICs
102. Simlat, Ltd
103. SK Infrared LLC
104. SpineDynX
105. SRICO, Inc.
106. Tenet3
107. TruWeatherSolutions
108. UES
109. United Technology Corp. -Dayton
110. Unmanned Science, Inc (USI)
111. UTRC
112. Xerion
113. Youngstown Business Incubator

Appendix 5: Program Expenditures & Costs

Funds Expended Report – As of 30 June 2026 (Figures 33 - 37)

OHIO DEPARTMENT OF HIGHER EDUCATION
WORKFORCE DEVELOPMENT AND EMERGING MISSIONS MOU's
OFRN FUNDS EXPENDED REPORT

Please Type all Information

Subaward No.: 60064366/Sec.381.440, Ohio H.B. 49 of 132nd G.A.

Recipient:	Parallax Advanced Research
Project:	Ohio Federal Research Network - Centers of Excellence
Reporting Period:	July 1, 2025 - June 30, 2026

Budget Categories (Subawards)	(A) Budgeted Amount	(B) Total Costs Through Last Report	(C) Costs Incurred This Period Only	(D) Balance A-(B+C)=D	Cumulative Expenditures B+C
PERSISTENT SURVEILLLANCE SYSTEMS (PROJECT 315)	$1,998,349	$1,998,349	$0	$0	$1,998,349
GHOST WAVE (PROJECT 309)	$1,344,597	$1,344,597	$0	$0	$1,344,597
UNIVERSITY OF CINCINNATI (PROJECT 314)	$968,938	$968,938	$0	$0	$968,938
OFRN CONSULTANTS	$213,986	$213,986	$0	$0	$213,986
WSARC UNALLOCATED	$22,494	$22,494	$0	$0	$22,494
THE OHIO STATE UNIVERSITY PROJECTS (303) & ADMIN	$2,180,596	$2,180,596	$0	$0	$2,180,596
FLIGHTPROFILER (PROJECT 502)	$29,731	$29,731	$0	$0	$29,731
ASYMMETRIC (PROJECT 528)	$113,006	$113,006	$0	$0	$113,006
MIAMI UNIVERSITY (PROJECT 552)	$19,667	$19,667	$0	$0	$19,667
THE OHIO STATE UNIVERSITY (PROJECT 542)	$8,636	$8,636	$0	$0	$8,636
TOTAL	$6,900,000	$6,900,000	$0	$0	$6,900,000

CERTIFICATION: I hereby certify that the above amounts are true and accurate to the best of my knowledge; that all costs incurred are solely for the purpose set forth in ODHE MOU. Appropriate documentation, including, but not lmited to, receipts or other evidence of payment, is on file and available as provided for in the Award Agreement.

Authorized Signature: _____ Date: 09/30/2026

Typed Name: Dennis Andersh

STATE USE ONLY BELOW THIS LINE

CAP: _____

Project Administrator: _____ Date: _____

Figure 33: OFRN Funds Expended Report Round 3

Note: OFRN Round 5 project NCE expenses charged to Round 3 to spend down unspent Round 3 project funding $171K
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OHIO DEPARTMENT OF HIGHER EDUCATION
WORKFORCE DEVELOPMENT AND EMERGING MISSIONS MOU's
OFRN FUNDS EXPENDED REPORT

Please Type all Information

Subaward No.: 60073805/Sec.381.440, Ohio H.B. 166 of 133rd G.A.

Recipient:	Parallax Advanced Research
Project:	Ohio Federal Research Network - Centers of Excellence
Reporting Period:	July 1, 2025 - June 30, 2026

Budget Categories (Subawards)	(A) Budgeted Amount	(B) Total Costs Through Last Report	(C) Costs Incurred This Period Only	(D) Balance A-(B+C)=D	Cumulative Expenditures B+C
ASYMMETRIC TECHNOLOGIES (PROJECT 422)	$1,429,017	$1,429,017	$0	$0	$1,429,017
CAL ANALYTICS (PROJECT 424)	$1,399,882	$1,399,882	$0	$0	$1,399,882
GHOST WAVE (PROJECT 417)	$1,262,622	$1,262,622	$0	$0	$1,262,622
KENT STATE UNIVERSITY (PROJECT 428)	$1,200,661	$1,200,661	$0	$0	$1,200,661
RIVERSIDE RESEARCH (PROJECT 405)	$1,176,717	$1,176,717	$0	$0	$1,176,717
YOUNGSTOWN BUSINESS INCUBATOR (PROJECT 421)	$972,877	$972,877	$0	$0	$972,877
OFRN ADMINISTRATION	$2,136,723	$2,136,392	$331	$0	$2,136,723
TOTAL	$9,578,500	$9,578,169	$331	$0	$9,578,500

CERTIFICATION: I hereby certify that the above amounts are true and accurate to the best of my knowledge; that all costs incurred are solely for the purpose set forth in ODHE MOU.
Appropriate documentation, including, but not lmited to, receipts or other evidence of payment, is on file and available as provided for in the Award Agreement.

Authorized Signature: _____ Date: 09/30/2026

Typed Name: Dennis Andersh

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CAP: _____

Project Administrator: _____ Date: _____

Figure 34: OFRN Funds Expended Report Round 4

OHIO DEPARTMENT OF HIGHER EDUCATION
WORKFORCE DEVELOPMENT AND EMERGING MISSIONS MOU's
OFRN FUNDS EXPENDED REPORT

Please Type all Information

Subaward No.: GR125178/Sec.381.373, Ohio H.B. 110 of 134th G.A.

Recipient:	Parallax Advanced Research
Project:	Ohio Federal Research Network - Centers of Excellence
Reporting Period:	July 1, 2025 - June 30, 2026

Budget Categories (Subawards)	(A) Budgeted Amount	(B) Total Costs Through Last Report	(C) Costs Incurred This Period Only	(D) Balance A-(B+C)=D	Cumulative Expenditures B+C
FLIGHTPROFILER (PROJECT 502)	$787,612	$787,612	$0	$0	$787,612
THE OHIO STATE UNIVERSITY (PROJECT 507)	$1,739,488	$1,739,488	$0	$0	$1,739,488
ASYMMETRIC TECHNOLOGIES (PROJECT 528)	$1,233,998	$1,233,998	$0	$0	$1,233,998
ALPHAMICRON (PROJECT 529)	$849,999	$849,999	$0	$0	$849,999
THE OHIO STATE UNIVERSITY (PROJECT 542)	$951,943	$951,943	$0	$0	$951,943
SAFRAN (PROJECT 550)	$1,256,590	$1,256,590	$0	$0	$1,256,590
MIAMI UNIVERSITY (PROJECT 552)	$368,625	$368,625	$0	$0	$368,625
OFRN ADMINISTRATION	$2,711,745	$2,711,745	$0	$0	$2,711,745
TOTAL	$9,900,000	$9,900,000	$0	$0	$9,900,000

CERTIFICATION: I hereby certify that the above amounts are true and accurate to the best of my knowledge; that all costs incurred are solely for the purpose set forth in ODHE MOU. Appropriate documentation, including, but not lmited to, receipts or other evidence of payment, is on file and available as provided for in the Award Agreement.

Authorized Signature: _____ Date: 09/30/2026

Typed Name: Dennis Andersh

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CAP: _____

Project Administrator: _____ Date: _____

Figure 35: OFRN Funds Expended Report Round 5

Note: OFRN Round 6 administration time and effort during FY23 charged to Round 5 and moved to Round 6 - $432,714.80
Note: OFRN Round 5 project underspends have been applied to OFRN admin expenses
Note: OFRN Round 5 no cost extensions given to 4 projects for a total spend of $214K for work performed July 1, 2023, through December 31, 2023 (FY24).
Note: OFRN Round 5 project NCE expenses charged to Round 3 to spend down unspent Round 3 project funding $171K
Note: OFRN Round 5 project expenses charged to Round 6 - $685,811 (FY24)
Note: OFRN Round 5 administration time and effort moved back to round 5: $215,641.89 (FY25)

OHIO DEPARTMENT OF HIGHER EDUCATION
WORKFORCE DEVELOPMENT AND EMERGING MISSIONS MOU's
OFRN FUNDS EXPENDED REPORT

Please Type all Information

Subaward No.: GR133672 / Sec.381.520, Ohio H.B. 33 of 135th G.A.

Recipient:	Parallax Advanced Research
Project:	Ohio Federal Research Network - Centers of Excellence
Reporting Period:	July 1, 2025 - June 30, 2026

Budget Categories (Subawards)	(A) Budgeted Amount	(B) Total Costs Through Last Report	(C) Costs Incurred This Period Only	(D) Balance A-(B+C)=D	Cumulative Expenditures B+C
GHOSTWAVE (PROJECT 602)	$ 1,020,120	$ 855,369	$ 164,751	$ 0	$ 1,020,120
THE OHIO STATE UNIVERSITY (PROJECT 609)	$ 1,219,956	$ 878,378	$ 341,578	$ 0	$ 1,219,956
UNIVERSITY OF AKRON (PROJECT 619)	$ 1,150,605	$ 794,108	$ 356,497	$ 0	$ 1,150,605
KAIROS (PROJECT 624)	$ 1,190,000	$ 1,190,000	$ -	$ 0	$ 1,190,000
ARCTOS (PROJECT 625)	$ 1,198,492	$ 1,073,572	$ 124,921	$ 0	$ 1,198,492
CFD (PROJECT 628)	$ 1,232,890	$ 1,040,750	$ 192,139	$ 0	$ 1,232,890
FLIGHTPROFILER (PROJECT 502)	$ 71,969	$ 71,969	$ -	$ 0	$ 71,969
ASYMMETRIC (PROJECT 528)	$ 106,850	$ 106,850	$ -	$ 0	$ 106,850
THE OHIO STATE UNIVERSITY (PROJECT 542)	$ 14,641	$ 14,641	$ -	$ 0	$ 14,641
SAFRAN (PROJECT 550)	$ 190,920	$ 190,920	$ -	$ 0	$ 190,920
MIAMI UNIVERSITY (PROJECT 552)	$ 301,432	$ 301,432	$ -	$ 0	$ 301,432
OFRN ADMINISTRATION	$ 2,652,125	$ 2,170,383	$ 374,761	$ 106,981	$ 2,545,144
TOTAL	$ 10,350,000	$ 8,688,372	$ 1,554,647	$ 106,981	$ 10,243,018

CERTIFICATION: I hereby certify that the above amounts are true and accurate to the best of my knowledge; that all costs incurred are solely for the purpose set forth in ODHE MOU. Appropriate documentation, including, but not lmited to, receipts or other evidence of payment, is on file and available as provided for in the Award Agreement.

Authorized Signature: _____ Date: 09/30/2026

Typed Name: Dennis Andersh

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CAP: _____

Project Administrator: _____ Date: _____

Figure 36: OFRN Funds Expended Report Round 6

Note: OFRN Round 6 administration time and effort during FY23 charged to Round 5 and moved to Round 6 - $432,714.80
Note: OFRN Round 5 project expenses charged to Round 6 - $685,811 (FY24).
Note: OFRN Round 5 administration time and effort moved back to round 5: $215,641.89 (FY25)
Note: The remaining funding is being held for rate actualization based on final approved DCAA rates for the 2025-2026 year.

OHIO DEPARTMENT OF HIGHER EDUCATION
WORKFORCE DEVELOPMENT AND EMERGING MISSIONS MOU's
OFRN FUNDS EXPENDED REPORT

Please Type all Information

Subaward No.: GR142242 / Sec.381.520, Ohio H.B. 96 of 136th G.A.

Recipient:	Parallax Advanced Research
Project:	Ohio Federal Research Network - Centers of Excellence
Reporting Period:	July 1, 2025 - June 30, 2026

Budget Categories (Subawards)	(A) Budgeted Amount	(B) Total Costs Through Last Report	(C) Costs Incurred This Period Only	(D) Balance A-(B+C)=D	Cumulative Expenditures B+C
The Ohio State University (project 716)	$ 1,250,000	$ -	$ 283,205	$ 966,795	$ 283,205
The Ohio State University (project 718)	$ 1,148,105	$ -	$ 409,870	$ 738,235	$ 409,870
Laser Fusion Solutions (project 724)	$ 1,133,686	$ -	$ 491,637	$ 642,049	$ 491,637
Kairos Research (project 736)	$ 1,249,875	$ -	$ 686,777	$ 563,099	$ 686,777
AsterTech (project 738)	$ 1,250,000	$ -	$ 411,161	$ 838,839	$ 411,161
The Ohio State University (project 739)	$ 1,093,778	$ -	$ 39,193	$ 1,054,585	$ 39,193
Mined XAI (project 740)	$ 1,243,931	$ -	$ 541,371	$ 702,560	$ 541,371
OFRN ADMINISTRATION	$ 1,828,625	$ -	$ 628,298	$ 1,200,327	$ 628,298
TOTAL	$ 10,198,000	$ -	$ 3,491,511	$ 6,706,489	$ 3,491,511

CERTIFICATION: I hereby certify that the above amounts are true and accurate to the best of my knowledge; that all costs incurred are solely for the purpose set forth in ODHE MOU.
Appropriate documentation, including, but not lmited to, receipts or other evidence of payment, is on file and available as provided for in the Award Agreement.

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Project Administrator: _____ Date: _____

Figure 37: OFRN Funds Expended Report Round 7

Cost Share Contribution Report – As of 30 June 2026 (Figures 38 – 42)

OHIO DEPARTMENT OF HIGHER EDUCATION
WORKFORCE DEVELOPMENT AND EMERGING MISSIONS MOUs
OFRN COST SHARE CONTRIBUTION REPORT

Please Type all Information

Subaward No.: 60064366/Sec.381.440, Ohio H.B. 49 of 132nd G.A.

Recipient:	Parallax Advanced Research
Project:	Ohio Federal Research Network - Cost Share Contribution
Reporting Period:	July 1, 2025 - June 30, 2026

Budget Categories (Subawards)	(A) Budgeted Amount	(B) Total Cost Share Through Last Report	(C) Cost Share Incurred This Period Only	(D) Balance A-(B+C)=D	Cumulative Cost Share B+C
PERSISTENT SURVVEILLLANCE SYSTEMS (PROJECT 315)	$5,482,826	$10,719,279	$0	-$5,236,453	$10,719,279
GHOST WAVE (PROJECT 309)	$1,247,722	$1,277,856	$0	-$30,134	$1,277,856
UNIVERSITY OF CINCINNATI (PROJECT 314)	$1,009,024	$1,062,407	$0	-$53,383	$1,062,407
THE OHIO STATE UNIVERSITY (PROJECT 303)	$2,230,000	$1,483,000	$0	$747,000	$1,483,000
TOTAL	$9,969,572	$14,542,542	$0	-$4,572,971	$14,542,542

CERTIFICATION: I hereby certify that the above amounts are true and accurate to the best of my knowledge; that all costs incurred are solely for the purpose set forth in ODHE MOU. Appropriate documentation, including, but not lmited to, receipts or other evidence of payment, is on file and available as provided for in the Award Agreement.

Authorized Signature: _____ Date: 09/30/2026

Typed Name: Dennis Andersh

STATE USE ONLY BELOW THIS LINE

CAP: _____

Project Administrator: _____ Date: _____

Figure 38: OFRN Cost Share Contribution Report Round 3

Note: A negative number in column D represents cost share provided in excess of budget.

OHIO DEPARTMENT OF HIGHER EDUCATION
WORKFORCE DEVELOPMENT AND EMERGING MISSIONS MOUs
OFRN COST SHARE CONTRIBUTION REPORT

Please Type all Information

Subaward No.: 60073805/Sec.381.440, Ohio H.B. 166 of 133rd G.A.

Recipient:	Parallax Advanced Research
Project:	Ohio Federal Research Network - Cost Share Contribution
Reporting Period:	July 1, 2025 - June 30, 2026

Budget Categories (Subawards)	(A) Budgeted Amount	(B) Total Cost Share Through Last Report	(C) Cost Share Incurred This Period Only	(D) Balance A-(B+C)=D	Cumulative Cost Share B+C
ASYMMETRIC TECHNOLOGIES (PROJECT 422)	$1,352,278	$1,727,916	$0	-$375,638	$1,727,916
CAL ANALYTICS (PROJECT 424)	$1,177,798	$1,314,983	$0	-$137,185	$1,314,983
GHOST WAVE (PROJECT 417)	$1,396,614	$145,828	$0	$1,250,787	$145,828
KENT STATE UNIVERSITY (PROJECT 428)	$1,011,776	$1,030,674	$0	-$18,898	$1,030,674
RIVERSIDE RESEARCH (PROJECT 405)	$748,260	$1,174,017	$0	-$425,757	$1,174,017
YOUNGSTOWN BUSINESS INCUBATOR (PROJECT 421)	$434,229	$413,532	$0	$20,697	$413,532
TOTAL	$6,120,955	$5,806,950	$0	$314,005	$5,806,950

CERTIFICATION: I hereby certify that the above amounts are true and accurate to the best of my knowledge; that all costs incurred are solely for the purpose set forth in ODHE MOU.
Appropriate documentation, including, but not lmited to, receipts or other evidence of payment, is on file and available as provided for in the Award Agreement.

Authorized Signature: _____ Date: 09/30/2026

Typed Name: Dennis Andersh

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Project Administrator: _____ Date: _____

Figure 39: OFRN Cost Share Contribution Report Round 4

Note: A negative number in column D represents cost share provided in excess of budget.

OHIO DEPARTMENT OF HIGHER EDUCATION
WORKFORCE DEVELOPMENT AND EMERGING MISSIONS MOUs
OFRN COST SHARE CONTRIBUTION REPORT

Please Type all Information

Subaward No.: GR125178/Sec.381.373, Ohio H.B. 110 of 134th G.A.

Recipient:	Parallax Advanced Research
Project:	Ohio Federal Research Network - Cost Share Contribution
Reporting Period:	July 1, 2025 - June 30, 2026

Budget Categories (Subawards)	(A) Budgeted Amount	(B) Total Cost Share Through Last Report	(C) Cost Share Incurred This Period Only	(D) Balance A-(B+C)=D	Cumulative Cost Share B+C
FLIGHTPROFILER (PROJECT 502)	$219,294	$218,065	$0	$1,229	$218,065
THE OHIO STATE UNIVERSITY (PROJECT 507)	$417,292	$471,448	$0	-$54,156	$471,448
ASYMMETRIC TECHNOLOGIES (PROJECT 528)	$1,083,526	$1,097,702	$0	-$14,176	$1,097,702
ALPHAMICRON (PROJECT 529)	$349,688	$350,000	$0	-$313	$350,000
THE OHIO STATE UNIVERSITY (PROJECT 542)	$287,559	$323,585	$0	-$36,026	$323,585
SAFRAN (PROJECT 550)	$1,010,331	$940,492	$0	$69,839	$940,492
MIAMI UNIVERSITY (PROJECT 552)	$821,376	$686,341	$0	$135,035	$686,341
TOTAL	$4,189,065	$4,087,634	$0	$101,431	$4,087,634

CERTIFICATION: I hereby certify that the above amounts are true and accurate to the best of my knowledge; that all costs incurred are solely for the purpose set forth in ODHE MOU.
Appropriate documentation, including, but not lmited to, receipts or other evidence of payment, is on file and available as provided for in the Award Agreement.

Authorized Signature: _____ Date: 09/30/2026

Typed Name: Dennis Andersh

STATE USE ONLY BELOW THIS LINE

CAP: _____

Project Administrator: _____ Date: _____

Figure 40: OFRN Cost Share Contribution Report Round 5

Note: A negative number in column D represents cost share provided in excess of budget.

OHIO DEPARTMENT OF HIGHER EDUCATION
WORKFORCE DEVELOPMENT AND EMERGING MISSIONS MOUs
OFRN COST SHARE CONTRIBUTION REPORT

Please Type all Information

Subaward No.: GR133672 / Sec.381.520, Ohio H.B. 33 of 135th G.A.

Recipient:	Parallax Advanced Research
Project:	Ohio Federal Research Network - Cost Share Contribution
Reporting Period:	July 1, 2025 - June 30, 2026

Budget Categories (Subawards)	(A) Budgeted Amount	(B) Total Cost Share Through Last Report	(C) Cost Share Incurred This Period Only	(D) Balance A-(B+C)=D	Cumulative Cost Share B+C
GHOSTWAVE (PROJECT 602)	$ 367,635	$ 168,765		$ 198,870	$ 168,765
THE OHIO STATE UNIVERSITY (PROJECT 609)	$ 181,951	$ 218,808		$ (36,857)	$ 218,808
UNIVERSITY OF AKRON (PROJECT 619)	$ 346,059	$ 434,871		$ (88,812)	$ 434,871
KAIROS (PROJECT 624)	$ 810,000	$ 912,908		$ (102,908)	$ 912,908
ARCTOS (PROJECT 625)	$ 108,031	$ 110,649		$ (2,618)	$ 110,649
CFD (PROJECT 628)	$ 76,704	$ 160,202	$ 11,715	$ (95,213)	$ 171,917
TOTAL	$ 1,890,379	$ 2,006,204	$ 11,715	$ (127,540)	$ 2,017,919

CERTIFICATION: I hereby certify that the above amounts are true and accurate to the best of my knowledge; that all costs incurred are solely for the purpose set forth in ODHE MOU. Appropriate documentation, including, but not lmited to, receipts or other evidence of payment, is on file and available as provided for in the Award Agreement.

Authorized Signature: _____ Date: 09/30/2026

Typed Name: Dennis Andersh

STATE USE ONLY BELOW THIS LINE

CAP: _____

Project Administrator: _____ Date: _____

Figure 41: OFRN Cost Share Contribution Report Round 6

Notes:
A negative number in column D represents cost share provided in excess of budget.
CFD project 628 – adjustment made to reflect final report

OHIO DEPARTMENT OF HIGHER EDUCATION
WORKFORCE DEVELOPMENT AND EMERGING MISSIONS MOUs
OFRN COST SHARE CONTRIBUTION REPORT

Please Type all Information

Subaward No.: GR142242 / Sec.381.520, Ohio H.B. 96 of 136th G.A.

Recipient:	Parallax Advanced Research
Project:	Ohio Federal Research Network - Cost Share Contribution
Reporting Period:	July 1, 2025 - June 30, 2026

Budget Categories (Subawards)	(A) Budgeted Amount	(B) Total Cost Share Through Last Report	(C) Cost Share Incurred This Period Only	(D) Balance A-(B+C)=D	Cumulative Cost Share B+C
The Ohio State University (project 716)	**$ 830,753**	**$ -**	**$ 66,918**	**$ 763,835**	**$ 66,918**
The Ohio State University (project 718)	**$ 1,428,590**	**$ -**	**$ 156,163**	**$ 1,272,427**	**$ 156,163**
Laser Fusion Solutions (project 724)	**$ 172,941**	**$ -**	**$ 87,432**	**$ 85,508**	**$ 87,432**
Kairos Research (project 736)	**$ 595,000**	**$ -**	**$ 394,442**	**$ 200,558**	**$ 394,442**
Aster Tech (project 738)	**$ 303,472**	**$ -**	**$ 289,735**	**$ 13,736**	**$ 289,735**
The Ohio State University (project 739)	**$ 192,524**	**$ -**	**$ 3,749**	**$ 188,775**	**$ 3,749**
Mined XAI (project 740)	**$ 127,696**	**$ -**	**$ 62,780**	**$ 64,916**	**$ 62,780**
TOTAL	**$ 3,650,976**	**$ -**	**$ 1,061,220**	**$ 2,589,756**	**$ 1,061,220**

CERTIFICATION: I hereby certify that the above amounts are true and accurate to the best of my knowledge; that all costs incurred are solely for the purpose set forth in ODHE MOU.
Appropriate documentation, including, but not lmited to, receipts or other evidence of payment, is on file and available as provided for in the Award Agreement.

Authorized Signature: _____ Date: 09/30/2026

Typed Name: Dennis Andersh

STATE USE ONLY BELOW THIS LINE

CAP: _____

Project Administrator: _____ Date: _____

Figure 42: OFRN Cost Share Contribution Report Round 7

Appendix 6: Finances – OFRN Funds Allocation (Figures 43 – 44)

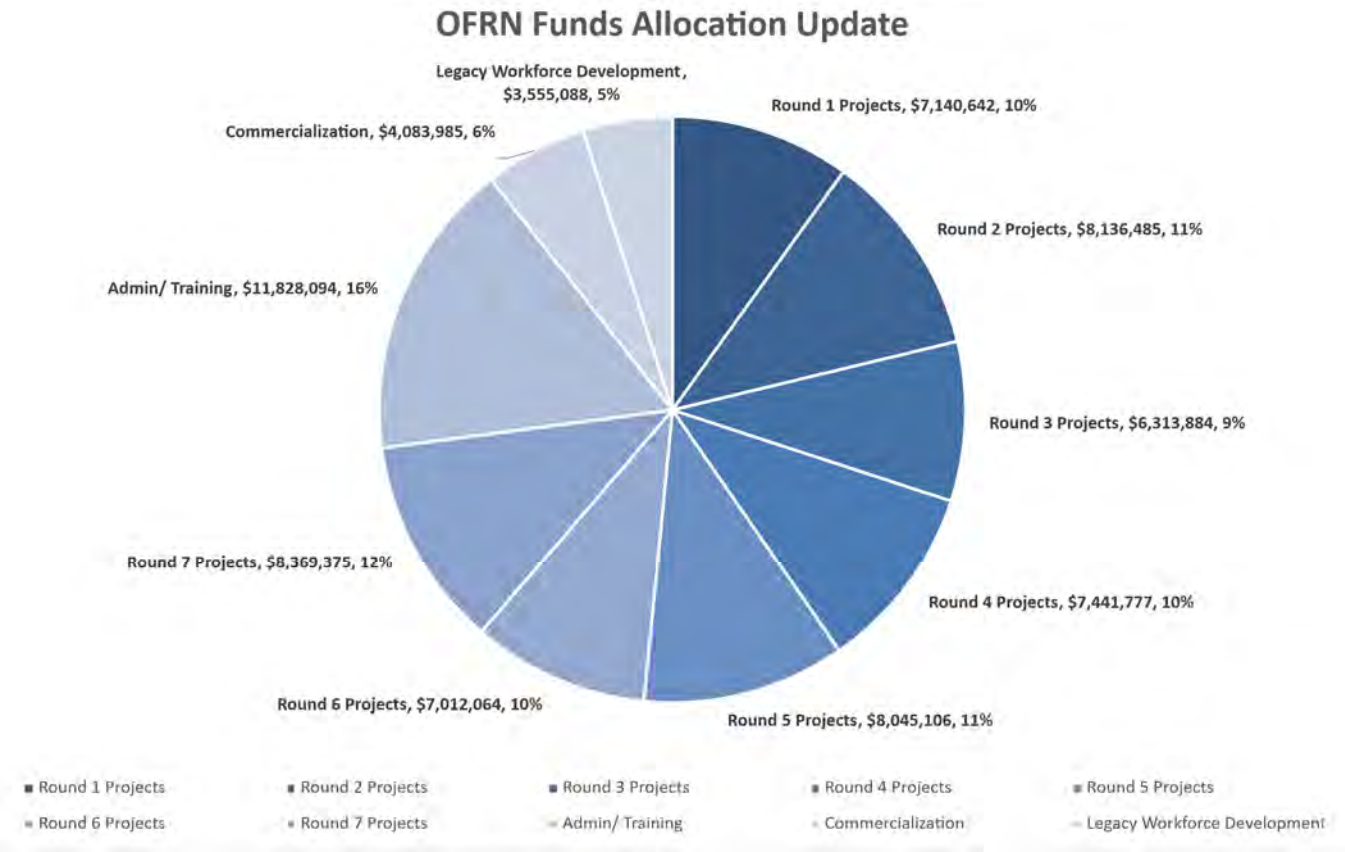


Figure 43: OFRN Funds Allocation update 6/30/2026

Total state operation funding for the OFRN programs for defense, aerospace, workforce development, and federal defense emerging mission is $72 million for FY16 through FY26. Figure 41 shows the percentage breakdown by category.

Note: OFRN Round 6 administration time and effort during FY23 charged to Round 5 - $271,629.63
Note: OFRN Round 5 project underspends have been applied to OFRN admin expenses
Note: OFRN Round 5 no cost extensions given to 4 projects for a total cost of $330k for work performed July 1, 2023, through December 31, 2023 (FY24)

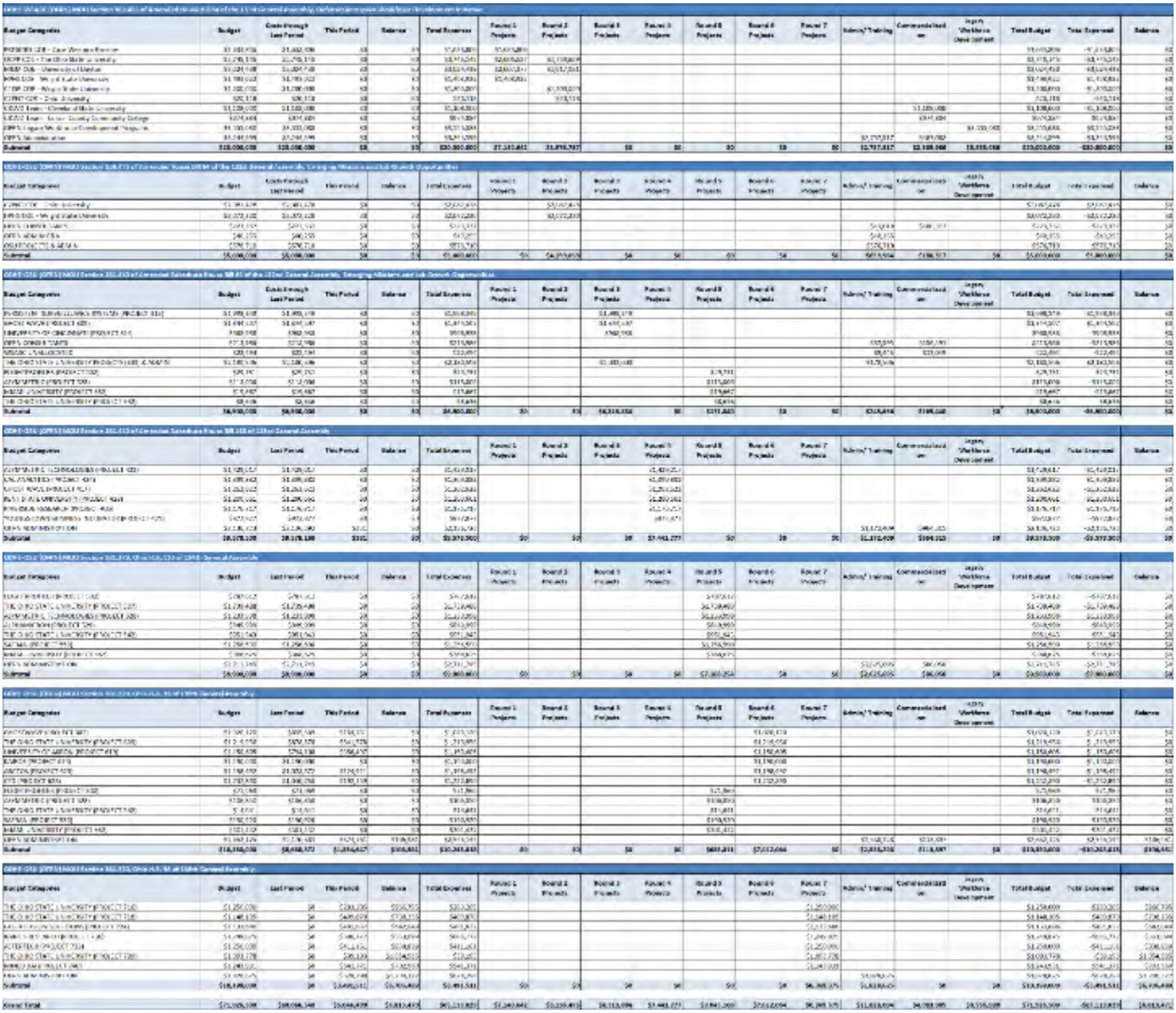


Figure 44: OFRN Budget and Expense Breakdown by Funding Round