

Ohio Federal and Military Jobs Commission (OFMJC) Support

Ohio Federal Research Network (OFRN) Improving Ohio's Economy Through R&D



WSU - Dennis Andersh



OSU - Marty Kress



Joint WPAFB/NASA Glenn Priorities

Reviewed and Refined OFMJC Research Priorities

AFRL Priorities

- Human Performance/ Health Sciences
- Hypersonics
- Directed Energy Weapons (Lasers)
- Autonomy
- C4ISR
- LVC
- Materials/ Manufacturing
- Propulsion

NASIC Priorities

- Cyber
- Data analytics
- C4ISR
- Modeling/Simulation/Analysis
- Hypersonics
- Directed Energy
- Space Systems

NASA Glenn Priorities

- Hybrid Electric Propulsion
- Air-breathing Propulsion
- Advanced Communications
- Solar Electric Propulsion
- Power and Energy Storage
- Materials and Manufacturing

Naval Medical Research Unit (NAMRU) Priorities

- Human performance
- Human physiology
- Manned / unmanned aeromedical ops
- Toxicology
- Risk assessment



FRN Funding Focus

	BASIC Research and Development	Applied Research and Development	Advanced Technology Development	Demonstration and Validation	Engineering and Manufacturing	RDT&E Management Support	Operational Systems Test and Validation
DOD RDT&E Level	6.1	6.2	6.3	6.4	6.5	6.6	6.7

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FRN COE Focus
Mission Application
Research for
NASA, AFRL, NAMRU
and NASIC



<u>NASA</u>	TRL1	TRL2	TRL 3	TRL 4	TRL 5	TRL 6	TRL 7	TRL 8	TRL 9
Basic Principles	Concepts Application Focus	Analysis and Experiments	Concept and Breadboard in Laboratory	Component and Breadboard Validation in Realistic Environments	System / Subsystem prototype demonstration in realistic Environment	System prototype demonstration in Operational Environment	Actual system completed and qualified through test and demonstration	Actual system proven through successful mission operations	



WPAFB / GRC Mission Applications Driven Centers of Excellence (COEs)

Projected Growth over 5 years: 2,500 new jobs for Ohioans
\$350 million in new federal research contracts to Ohio based universities and companies

Application Domains

Lead
LCCC, CSU

Application Domains	Human Performance and Health Sciences	Power and Propulsion	Materials and Manufacturing	Energy Storage/Integration	Command, Control, Communications Computing Intelligence Surveillance & Reconnaissance (C4ISR)	Advanced Communications Precision Navigation and Timing (PNT)
Aerospace Systems <ul style="list-style-type: none"> Manned Remotely Piloted Hypersonic 	<ul style="list-style-type: none"> Autonomy LVC Training Neuroscience Aerospace Physiology /Toxicology Biosensors / Biomarkers Human Machine Teaming RPA Operations 	<ul style="list-style-type: none"> Hybrid Electric Power and Propulsion Solar Electric Power and Propulsion Advanced Turbine Engines Energy / Fuels Energy Storage / Retrieval On-board Power Systems 	<ul style="list-style-type: none"> Nanomaterials Sustainment Additive Manufacturing Ceramics Composites Materials for Adverse Conditions Flexible Electronics 	<ul style="list-style-type: none"> Batteries Supercapacitors Green Technologies Rapid charge / discharge cycling Micro-devices 	<ul style="list-style-type: none"> Human- Centered ISR Data Analytics Data Compression / Analytics Processing Exploitations and Dissemination Infrared (IR), Electro-optical (EO), Laser, RF, Hyperspectral, Acoustic, & Radar Sensors Space Situational Awareness Electronics Warfare (EW) 	<ul style="list-style-type: none"> Directed Energy Offensive and Defensive EW Novel Payloads Avionics Next Gen Global Positioning Systems (GPS) Space Communications Tactical Communications RF Spectrum Management FCC Advanced Algorithms Digital Systems
Space Systems <ul style="list-style-type: none"> Manned Unmanned 						
Cyber Systems <ul style="list-style-type: none"> IT Weapon Systems 						
Modeling/Simulation/Analysis						
Commercialization & Technology Transition Small / Med Business Growth Connections to Business						
Workforce Development <ul style="list-style-type: none"> STEM Skilled Unskilled 						
Primary Support: All Universities to specifically include UC, UD, KSU, Miami, BGSU, Central WSU, Stark State, Clark, UA, UT, CSU, Lorain, Case, Sinclair, OU, OSU	Existing AHEAD Lead: WSU Primary Support: UC, UT, OSU, Case, UD, KSU, CSU, Sinclair, Lorain, Clark, Jobs Created: 575 Contracts Awarded: \$167M Private Sector Investment: \$150M Project 25% Y/Y Growth	Lead: OSU Primary Support: UC, UD, UA, UT, CSU, Lorain Potential Jobs : 400 Potential Contracts: \$100M Potential Private Sector Investment: \$50M	Lead: UD Primary Support: YSU, OSU, UA, Case, UC, UT, CSU, KSU, Lorain, Sinclair, Clark, Central Potential Jobs : 600 Potential Contracts: \$150M Potential Private Sector Investment: \$75M	Lead: Case Primary Support: UT, OSU, UD, UC, CSU, Lorain Potential Jobs : 200 Potential Contracts: \$50M Potential Private Sector Investment: \$10M	Lead: WSU/OSU Primary Support: UD, OU BGSU, Case, UT, UC, Miami , Sinclair Potential Jobs: 600 Potential Contracts: \$150M Potential Private Sector Investment: \$75M	Lead: OU Primary Support: WSU, OSU, KSU, UD, Miami, Lorain Potential Jobs : 300 Potential Contracts: \$75M Potential Private Sector Investment: \$25M



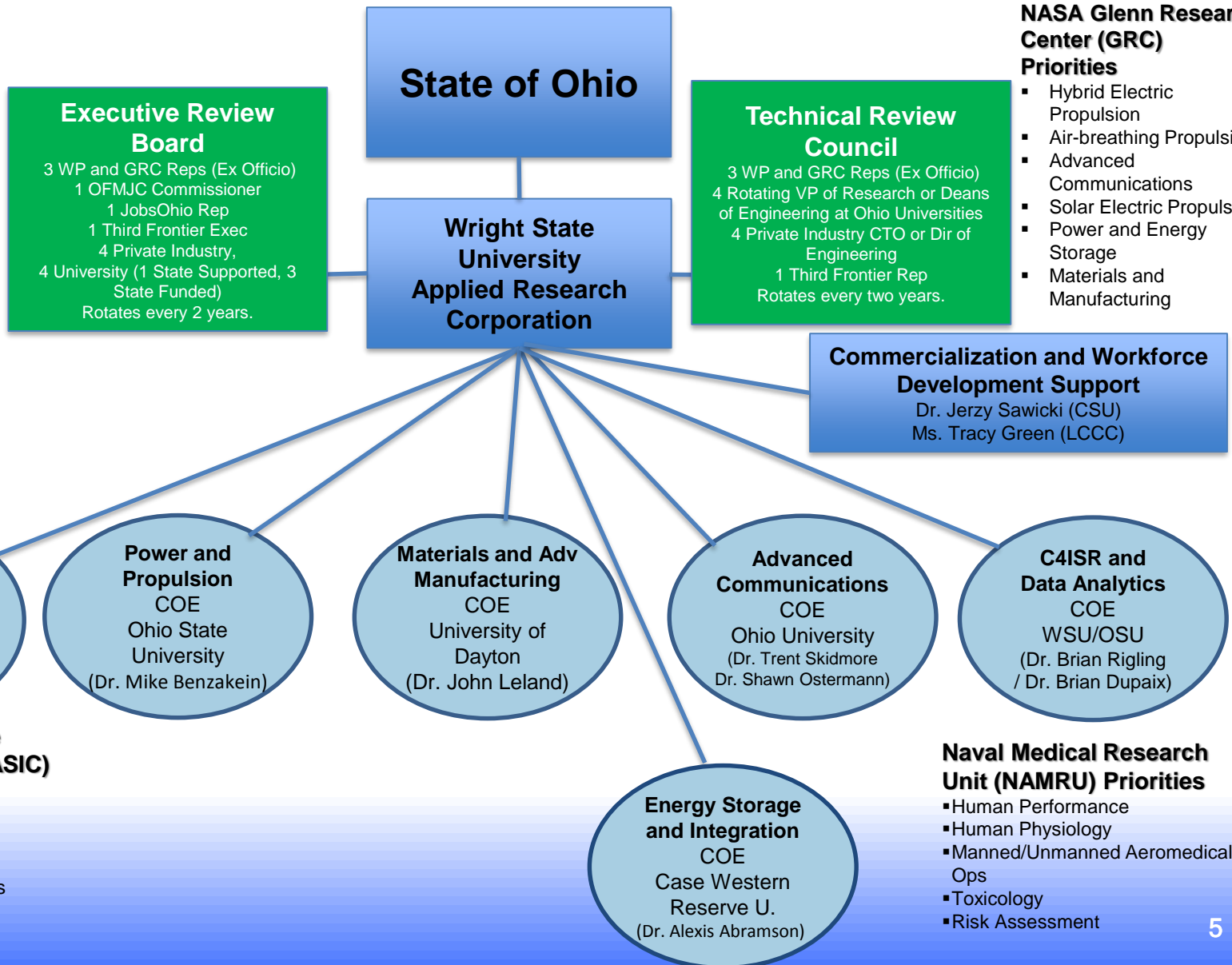
Construct for Ohio Centric Center of Excellence (COE) Ohio Federal Research Network (OFRN)

Air Force Research Laboratory (AFRL) Priorities

- Human Performance / Health Care
- Hypersonics
- Directed Energy Weapons (Lasers)
- Autonomy
- C4ISR
- LVC
- Materials / Manufacturing
- Propulsion

NASA Glenn Research Center (GRC) Priorities

- Hybrid Electric Propulsion
- Air-breathing Propulsion
- Advanced Communications
- Solar Electric Propulsion
- Power and Energy Storage
- Materials and Manufacturing



National Air and Space Intelligence Center (NASIC) Priorities

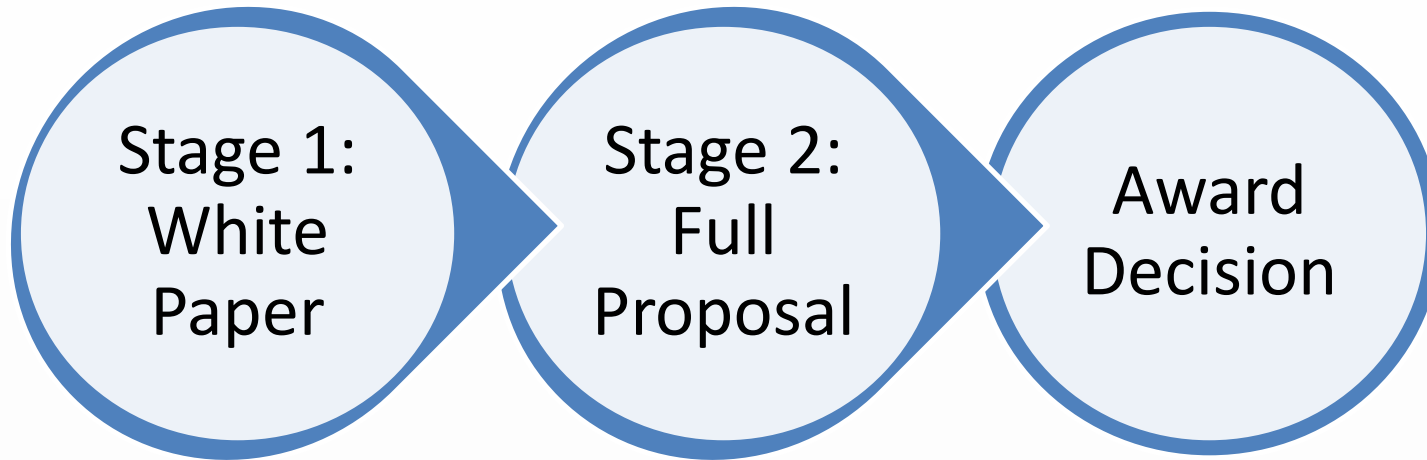
- Cyber
- Data analytics
- C4ISR
- Modeling/Simulation/Analysis
- Hypersonics
- Directed Energy

Naval Medical Research Unit (NAMRU) Priorities

- Human Performance
- Human Physiology
- Manned/Unmanned Aeronautical Ops
- Toxicology
- Risk Assessment



FRN Peer Review Process



1. White Papers are reviewed by the FRN Technical Review Council (TRC).
2. Full Submissions are reviewed by FRN Technical Review Council (TRC) and the FRN Executive Review Board (ERB).
3. Review recommendations are presented to the Federal Military Jobs Commission (FMJC) and the Ohio Department of Higher Education (ODHE) for approval of funding.



Reviewer (ERB and TRC) Composition

Executive Review Board	Designee	Technical Review Council	Designee
Cleveland State President	Dr. Ron Berkman	UT VP of Research	Dr. Bill Messer
OSU Dean of Engineering	Dr. Dave Williams	UC Dept Head AEEM, OAATC	Dr. Paul Orkwis
WSU President	Dr. Dave Hopkins	OU Dean of Engineering	Dr. Dennis Irwin
LCCC President	Dr. Roy Church	CWRU VP of Research	Dr. Suzanne Rivera
OFMJC	Gary O'Connell	UDRI	Dr. John Leland
NASA Glenn Director	Dr. Janet Kavandi	OFMJC	Don Campbell
AFRL	Jack Blackhurst	NASA Glenn	Sandra Reehorst
NASIC	Curt Rowland	AFRL	Chris Ristich, Stephanie Miller
NAMRU-D	Richard Arnold	NASIC	Dale Benedetti, Mark Brown
Jobs Ohio	Glenn Richardson	NAMRU-D	Richard Arnold
Ohio National Guard	Maj Gen Mark Bartman	Ohio National Guard	Brig Gen Gregory Schnulo
Ohio Third Frontier	Karen Conrad	Ohio Third Frontier	Paul Jackson
Industry 1 Chair	Ricky Peters, Ascend	Industry 1	Dr. Carlos Grodsinsky
Industry 2	Salvatore Miraglia, Jr.	Industry 2	Ed Morris
		Industry 3	Dr. T. S. Sudarshan
		Industry 4	Dr. Darren McKnight
		Industry 5	Dr. Suguna Rachakonda



FRN Funding Allocation - Update

Total State Operating Funding for FY 16 and 17		\$ 25 M
▪ Aerospace Workforce Development Legacy Programs	(\$1.5M/Yr)	\$(3 M)
▪ FRN Admin., Financial, and Organizational Support	(\$1M/Yr)	\$(2 M)
▪ Funding Available for 6 COEs' Research and Business Plans		\$ 20 M
▪ Tech Commercialization/Workforce Development Support (LCCC/CSU)		\$(2 M)
▪ Round 1 Proposal Funding Allocation ~\$7.1 M – Avg. Project Award - \$695k		\$(7.1 M)
▪ HPHS (WSU)	\$1.5 M	
▪ OCPP (OSU)	\$2 M	
▪ M&M (UD/UDRI)	\$2 M	
▪ PRESIDES (CASE)	\$1.6 M	
▪ Round 2 Funding Allocations - \$8.5 M Avg Project Award ~\$1M		\$(8.5M)
▪ C4ISR (OSU/WSU)	\$1.2M	
▪ C2PNT (OU)	\$2.1M	
▪ OCPP (OSU)	\$2.0M	
▪ M&M (UD/UDRI)	\$1.1M	
▪ HPHS (WSU)	\$2.1M	
▪ Statewide Challenge Problem Set-Aside - \$2.4 M		\$2.4M



Round 1 Technical Awardees

Awardee	COE	Award Amount	Cost Share	Partners
Case Western Reserve University	The Partnership for Research in Energy Storage (PRESIDES) Center of Excellence	\$1.6 million: (\$800k in year 1; \$800k in year 2)	\$750,000 University Partners: \$640,282 Small Business: \$39,718 Large Business: \$70,000	University Partners: Ohio State University, University of Akron, University of Toledo, University of Dayton Industry Partners: Small Business: pHMatter LLC, CRG Inc, UES Inc., CAR Technologies LLC, Large Business: Lubrizol Advanced Materials, Inc., GrafTech International Holdings Inc.; Americarb
University of Dayton	The Materials and Manufacturing (M&M) Center of Excellence	\$2 million: (\$1MM in year 1; \$1MM in year 2)	\$1,694,531 University Partners: \$1,648,531 Small Business: \$46,000 Large Business: \$0	University Partners: University of Akron, Case Western Reserve University, Ohio State University, University of Cincinnati, University of Toledo, Ohio University, Youngstown State University Industry Partners: Small Business: Akron Polymer Systems, Lucintech Inc., Orbital Research Inc., Hana Microdisplay Technologies Inc., Norman Noble Inc., Electrodyne Large Business: GE Aviation, Lincoln Electric, Eaton
Ohio State University	The Ohio Center for Power and Propulsion (OCPP) Center of Excellence	\$2 million: (\$750k in year 1; \$750k in Year 2; \$500k in year 3)	\$1,633,514 University Partners: \$1,633,514 Large Business: Phase 2 Possible \$995,000 from GE Aviation	University Partners: University of Akron, University of Dayton Industry Partners: Small Business: Orbital Research, Inc., Large Business: Emerson Network Power, Meggitt-USA Inc., Parker Hannifin Corporation, GE Aviation
Wright State University	The Human Performance and Health Science (HPHS) Center of Excellence	\$1.5 million: (\$745k in year 1; \$755k in year 2)	\$854,536 University Partners: \$704,795 Small Business: \$149,741 Large Business: \$0	University Partners: University of Cincinnati, University of Toledo, AFIT, Case Western Reserve University Industry Partners: Small Business: The Perduco Group, Advanced TeleSensors Large Business: University of Toledo Medical Center, Dayton Children’s Hospital, Crown Equipment, University Hospitals Case Medical Center, University of Cincinnati Medical Center, Premier Health, Red Bull



Round 2 Technical Awardees

Awardee	COE	Award Amount	Cost Share	Partners
Ohio State University and Wright State University	The Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) Center of Excellence	\$1,200,000 (Yr1: \$585,034 Yr2: \$614,966)	\$693,117 University Partners: \$559,117 Small Business: \$134,000 Large Business: \$0	COE Partners: HPHS COE University Partners: Ohio University, Case Western Reserve University Industry Partners: Small Business: Tenet3, Perduco, DesignKnowledge, Illumination Works, DelphicDB, Columbus Collaboratory, Amperand, MatchTx Large Business: Hewlett Packard, Lexis Nexis, Ipsos, Nuance
Ohio University	The Advanced Communications, Positioning, Navigation and Timing (C2PNT) Center of Excellence	\$2,100,002	\$2,176,046 University Partners: \$726,046 Small Business: \$1,325,000 Contingent \$4,200,000 Large Business: \$0 Federal Partner Contingent: \$1,250,000	COE Partners: HPHS COE University Partners: Wright State University, Air Force Institute of Technology Industry Partners: Small Business: Galois, Inc., Comsat Architects, Gird Large Business: None
University of Dayton	The Materials and Manufacturing (M&M) Center of Excellence	\$1,097,197 (Yr1: \$570,433 Yr2: \$526,764)	\$1,413,139 University Partners: \$1,353,139 Small Business: \$40,000 Large Business: \$20,000	University Partners: Case Western Reserve University, Ohio University, University of Cincinnati, Wright State University, Youngstown State University Industry Partners: Small Business: NONA Composites, Cincinnati Inc. Large Business: Orbital ATK, GE Aerospace
Ohio State University	The Ohio Center for Power and Propulsion (OCP) Center of Excellence	\$1,999,838 (Yr1: \$872,120 Yr2: \$1,127,715)	\$2,614,219 University Partners: \$1,614,219 Small Business: \$0 Large Business: \$1,000,000	University Partners: University of Dayton, Case Western Reserve University, University of Cincinnati, The Ohio State University, Air Force Institute of Technology Industry Partners: Small Business: Innovative Scientific Solutions, Inc; Large Business: Honeywell, Battelle
Wright State University	The Human Performance and Health Science (HPHS) Center of Excellence	\$2,115,001	\$2,582,345 University Partners: \$1,689,345 Small Business: \$733,000 Large Business: \$0 Federal Partner: \$160,000	University Partners: University of Cincinnati, Ohio State University, University of Toledo Industry Partners: Small Business: Eccrine Systems, Bertec Corp, SpineDynX Large Business: None



Successes to Date

- **Working to establish a funding mechanism from AFRL through State of Ohio's to augment proposed joint COE TEAS autonomy project. \$>\$11M**
 - Company from Portland will establish new office in Dayton
- **Proposal Quality in Round 2 Greatly Improved over Round 1**
 - Provided proposal training to approximately 90 researchers across Ohio
 - Plan another couple of proposal training classes over the next 3 months.
 - Trying to teach universities to write proposals for AF / NASA / DARPA etc.
- **Created an OFRN I-Core Program**
 - Train PI's and researchers how to work and sell to the Government and Industry
 - Complement Ohio's I-Core model
 - 13 Teams Statewide have submitted intent to propose on this new Joint effort with OSU
- **Joint Flexible Electronics and Trust Business Development Effort**
 - University of Akron and Wright State University
 - Working with AFRL Sensors Directorate
- **Joint Additive Manufacturing Effort with AFRL, Youngstown State, Kent State and Youngstown Air Reserve Unit to Help reduce the Challenge of Part Obsolescence**
 - Leveraged ODHE's RAPIDS Program
- **Multiple Universities Across State are Now Pursuing Joint Efforts at AFOSR, DARPA and ONR**
 - Joint Proposals in Excess of \$180M are now in the Pipeline across Ohio
 - Won \$30M+ of new Awards from DARPA, ONR, and AFRL