



MSI STEM  
Research & Development  
CONSORTIUM

# INNOVATION PROSPECTUS

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*Where ideas and opportunity converge*



*Engage diverse talent. Promote innovation. Engineer futures.*

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**[www.msrdconsortium.org](http://www.msrdconsortium.org)**

## ADVANCED MANUFACTURING & FABRICATION

- North Carolina Central University (1 award, \$149,518)
- San Diego State University (1 award, \$109,335)
- University of Texas, El Paso (1 award, \$149,999)

## ARMAMENTS & DEFENSE

- Florida A&M University (1 award, \$133,700)
- New Mexico Institute of Mining and Technology (6 awards, \$2,894,564)
- North Carolina A&T State University (2 awards, \$199,972)

## CHEMICAL & BIOLOGICAL (CHEM-BIO)

- Albany State University (1 awards, \$353,767)
- California State University, San Bernardino (1 award, \$534,650)
- The City College of New York (4 awards, \$401,382)
- Fisk University (2 awards, \$432,141)
- North Carolina A&T State University (3 awards, \$824,738)
- North Carolina Central University (2 awards, \$279,135)
- University of Texas, El Paso (1 award, \$77,336)
- University of Texas, Rio Grande Valley (1 award, \$124,978)
- University of Texas, San Antonio (2 awards, \$348,815)

## CYBER SECURITY & COMMUNICATION TECHNOLOGY

- The City College of New York (3 awards, \$466,641)

## DIVERSE WORKFORCE DEVELOPMENT

- Howard University (1 award, \$425,000)

## HOMELAND SECURITY TECHNOLOGIES

- New Mexico Institute of Mining and Technology (2 awards, \$485,359)
- North Carolina Central University (1 award, \$333,980)

## MACHINE LEARNING / BIG DATA / ARTIFICIAL INTELLIGENCE

- The City College of New York (1 award, \$300,000)
- Howard University (1 award, \$220,222)
- University of Maryland, Baltimore County (1 award, \$132,473)
- University of Texas, San Antonio (2 awards, \$93,000)

## MARITIME TECHNOLOGIES

- University of Texas, San Antonio (1 award, \$463,000)

## OPTICS & PHOTONICS

- Florida A&M University (1 award, \$149,998)
- San Diego State University (1 award, \$140,464)
- University of North Carolina at Charlotte (2 awards, \$60,000)

## OUR MEMBERS ALSO HAVE EXPERTISE IN:

- Advanced Energy Technologies
- Advanced LED & Photovoltaic Technology
- Advanced Manufacturing & Fabrication
- Analyses & Reports
- Biofuels & Alternative Fuels
- Concentrated Solar Power
- Control of Aquatic Invasive Species
- Electronic Warfare Sciences
- Evaluation Research & Studies
- Maritime Technologies
- Pipeline Testing
- Survey Research
- Transformational Synbio for Military Environments
- Workforce Research, Analyses & Studies

*... and many more.*

## OUR FUNDING PARTNERS

- Department of Defense
- Department of State
- Department of Energy
- Department of Transportation
- Department of Homeland Security
- Office of Naval Research
- Defense Threat Reduction Agency
- Naval Surface Warfare Center
- Joint Program Executive Office
- US Army Chemical Biological Center
- US Army Research Laboratory
- United States Coast Guard
- United States Customs & Border Protection

# EXCEPTIONAL RESULTS

Members that **proactively** seek out and develop relationships with government Program Managers outperform their peers with research funding. These new relationships often lead to repeat research opportunities and initiatives over time.



## Example of Member Success

### Performance Metrics

Time to leverage membership	15 months
Proposal success rate	100%
Total Value of Awards Won	\$3.4M
Value of Subcontracts to Private Industry Partners	\$1.7M
Total Funding Procurement Time (Start to Award)	90 days

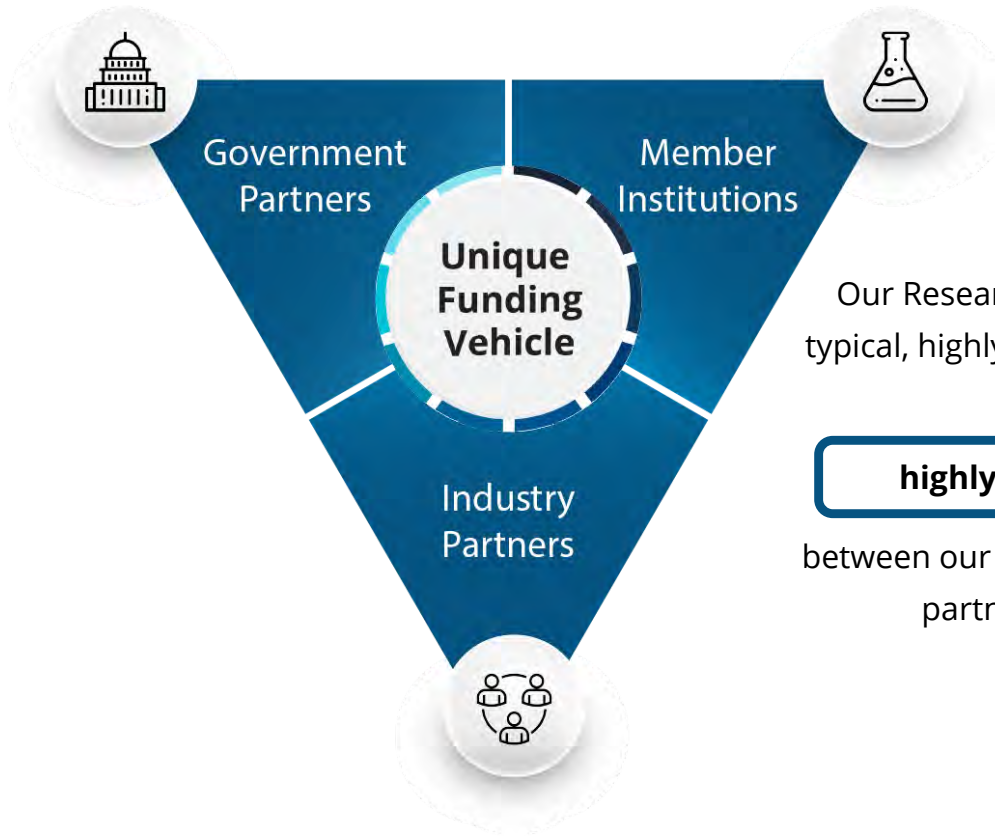
### RESEARCH PARTNERS

- Department of State
- Naval Surface Warfare Center
- Joint Program Executive Office
- U.S. Army Combat Capabilities Development Command, Armaments Center

### 2 PRIVATE INDUSTRY PARTNERS (SUBCONTRACTORS)

Within 15 months of joining MSRDC, the member won 5 awards totaling over \$3.4M within a span of just 90 days...

**with no competition.**



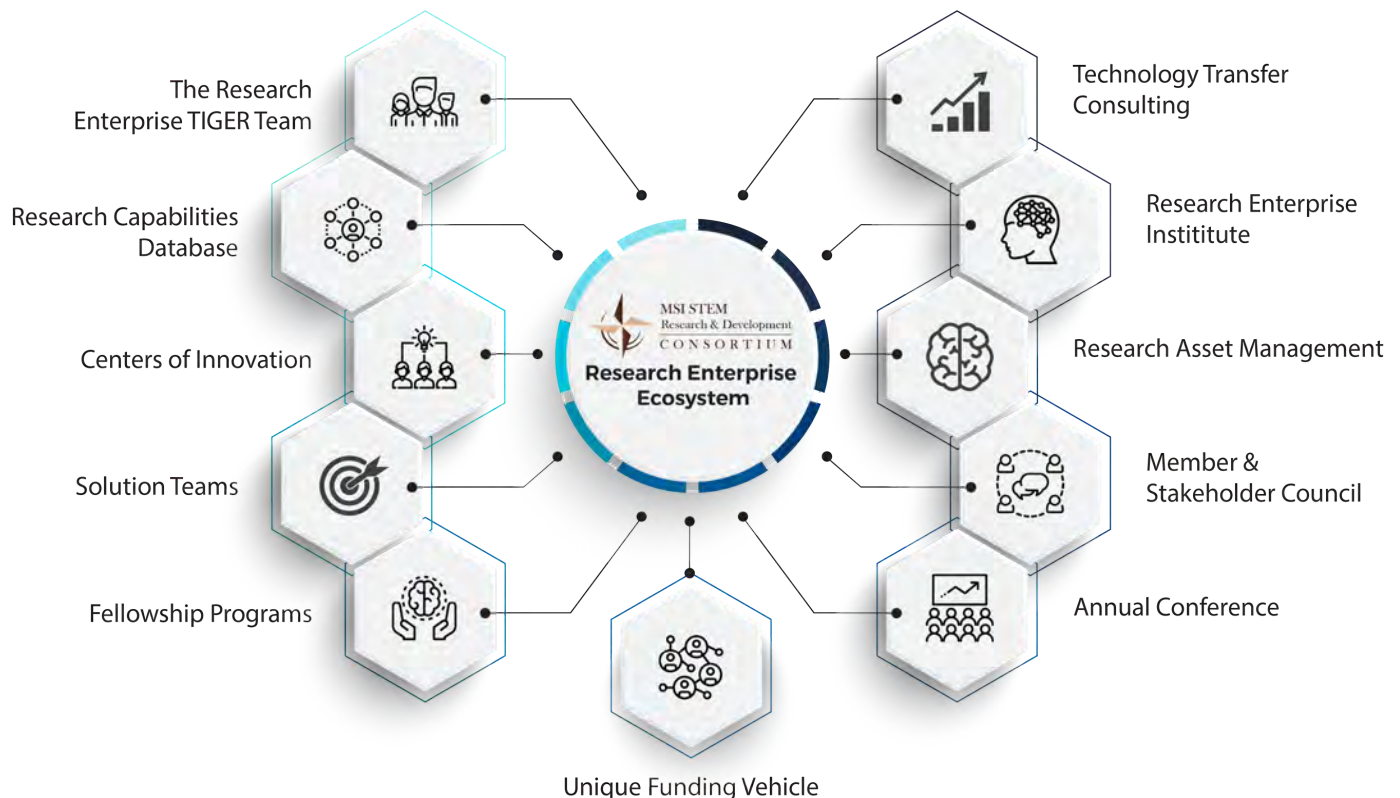
Our Research Enterprise is not subject to the typical, highly complex federal competition rules.

This results in a

**highly collaborative environment**

between our members, industry and government partners for technical innovation.

## The Research Enterprise Ecosystem





*These metrics reflect MSRDC's impact upon its members since 2016.*

**\$15M**

RESEARCH  
DOLLARS

**\$3M**

RESEARCHER  
SUPPORT

**\$2.2M**

PARTNER  
SUPPORT

**\$1.5M**

EQUIPMENT  
FUNDING

**\$843K**

STUDENT  
SUPPORT

**\$183K**

TRAVEL  
SUPPORT

## Team Teaches Drones How to Fly Like a Flock of Starlings

Dr. Umit Uyar, The City College of New York

Anyone who has watched a flock of starlings or pigeons dance in the sky has to marvel at how so many individuals can fly in such precise patterns without colliding and, seemingly, without communicating with one another.

A team led by computer engineering professor Umit Uyar of The City College of the City University of New York is working to teach drones how to do it. Such drones – actually, they're autonomous unpiloted aerial vehicles or UAVs – could work independently and yet together to clutter and confuse enemy radar or take out a hostile jamming station.

The U.S. military is keen to make use of such swarming technology, especially if it could use cheap or even disposable unpiloted aerial vehicles. With a grant from the U.S. Army Combat Capabilities Development Command, organized by the MSI STEM Research & Development Consortium, Uyar and colleagues have taken the first steps towards programming artificial intelligence into UAVs to that they can act independently and yet collectively.

"Unlike drones, which are controlled remotely, these govern themselves," Uyar said. "The pilot is the artificial intelligence software, which running inside the drone computer. There is no human intervention, no centralized control."

Read the full story at <https://www.msrdconsortium.org/stories-uyar>





## RESEARCH PROSPECTUS

*Talent meets challenge*



Engage diverse talent. Promote innovation. Engineer futures.

[www.msrdconsortium.org](http://www.msrdconsortium.org)

## DEPARTMENT OF ENERGY

*The U.S. Department of Energy (DOE) Building Technologies Office (BTO) leads a vast network of research and industry partners to continually develop innovative, cost-effective energy saving solutions—better products, better new homes, better ways to improve older homes, and better buildings in which we work, shop, and lead our everyday lives.*

## RESIDENTIAL AND COMMERCIAL BUILDINGS

### Selected Researchers

*Our accomplished member institutions bring a wealth of knowledge and expertise that elevate research from acceptable to exceptional. To support your work, we have selected some of our accomplished business partners, member institutions and researchers:*

#### City College of New York

Dr. Jorge E. Gonzalez

Department of Mechanical Engineering

**Expertise:** Compact solar-powered air conditioning systems, simulation of an air-cooled solar-assisted absorption air conditioning system and automation and control of solar air conditioning systems

#### Florida A&M University

Dr. Mahsan Mohsenin

Department of Mechanical Engineering

**Expertise:** Building information modeling, healthy building environment, urban sustainability, daylighting modeling and simulation

#### University of New Mexico

Dr. Andrea Mammoli

Department of Mechanical Engineering

**Expertise:** Distribution microgrids, buildings, resilience

#### University of North Carolina at Charlotte

Dr. Weimin Wang

Department of Engineering

**Expertise:** Building system modeling, analysis, and control; sustainable building design and operation; building grid integration



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MSRDC + DOE | 6

# MEMBER ADVANTAGES

MSRDC's unique funding vehicle allows researchers to create their own federal funding opportunities.

## Build a relationship

01

Build rapport with the government program manager to learn about their research priorities.

## Identify the problem

Leverage the relationship to understand the technical challenge or need

02

## Build a great team

03

Create a collaborative team and submit a white paper with a tailored research solution.

## Scope of Work

Once approved, the government program manager writes a Scope of Work and sends to MSRDC.

04

## Request for Proposal

05

The government program manager issues a formal Request for Proposal via MSRDC.

## Team Responds

The research team responds with a tailored solution that directly answers the research question.

06

## Delivery Order

07

The government issues a Delivery Order that begins the work.

## Begin the research

"MSRDC didn't just get me started, they were there through the whole project. From start to finish, they were by my side." Tomi



Members are able to negotiate direct, non-competed awards with government program managers



Members can bypass the competitive process for direct, non-competed awards



Awards are very quick with an average 90-day turn around

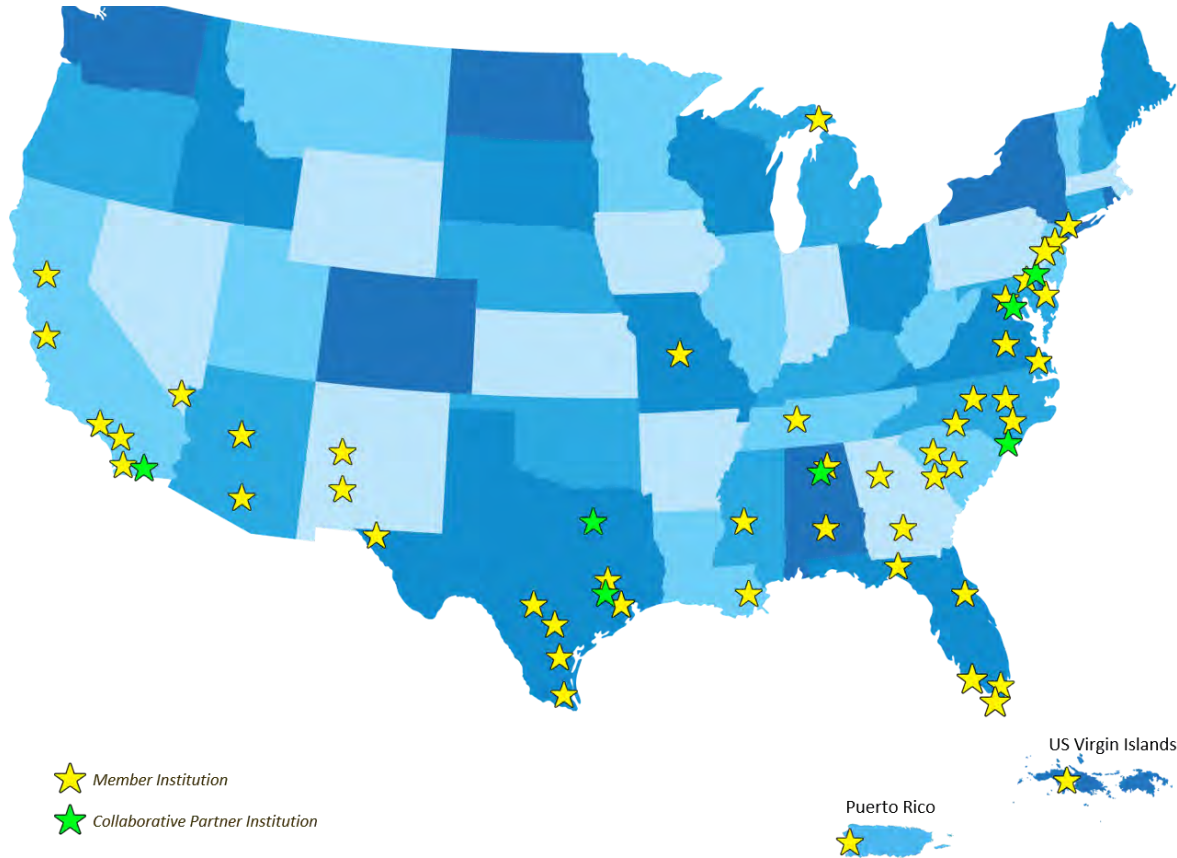


There are no communications blackout periods with government Program Managers



Research opportunities include basic, applied and advanced technology development as well as studies, analyses, evaluation and survey reports

We are a **rapidly emerging ecosystem** driven by diverse talent at minority-serving institutions. Our members create new and innovative solutions to complex problems.



We are the **first and only consortium of its kind** that significantly increases direct, non-competed awards and the involvement of minority-serving institutions in government research.

**60%**

HBCU MEMBERS

**30%**

HSI MEMBERS

**10%**

ALL OTHERS



## Historically Black Colleges & Universities (HBCUs)

- Alabama A&M University
- Alabama State University
- Albany State University
- Benedict College
- Bethune-Cookman University
- Claflin University
- Delaware State University
- Dillard University
- Fayetteville State University
- Fisk University
- Florida A&M University
- Florida Memorial University
- Hampton University
- Howard University
- Jackson State University
- Johnson C. Smith University
- Lincoln University, Pennsylvania
- Lincoln University of Missouri
- Meharry Medical College
- Morehouse College
- Morehouse School of Medicine
- Morgan State University
- Norfolk State University
- North Carolina A&T State University
- North Carolina Central University
- Paine College
- Prairie View A&M University
- Shaw University
- Tennessee State University
- Texas Southern University
- Tougaloo College
- Tuskegee University
- University of the District of Columbia
- University of the Virgin Islands
- Virginia State University
- Xavier University of Louisiana

## Collaborative Partners

- California Institute of Technology, Jet Propulsion Laboratory
- Duke University (TIM, SMIF)
- Georgia Institute of Technology
- Georgia Tech Research Institute
- North Carolina State University
- Research Triangle Institute
- Texas A&M University
- University of Delaware
- University of North Carolina at Chapel Hill
- University of North Carolina at Wilmington
- University of North Texas
- University of Southern California
- Vanderbilt University

## Hispanic Serving Institutions (HSIs)

- California State University – Chico
- California State University – Northridge (also an AANAPISI)
- California State University – Sacramento (also an AANAPISI)
- California State University – San Bernardino
- City College of New York (also an AANAPISI)
- Hodges University
- New Jersey City University
- New Mexico Tech
- Northern Arizona University
- San Diego State University
- Texas A&M University – Corpus Christi
- Texas A&M University – Kingsville
- Texas A&M University – San Antonio
- Texas State University
- University of Arizona
- University of Maryland – Baltimore County
- University of Nevada – Las Vegas (also an AANAPISI)
- University of New Mexico
- University of North Carolina – Pembroke
- University of Puerto Rico – Mayaguez
- University of Texas – Brownsville
- University of Texas – El Paso
- University of Texas – Rio Grande Valley
- University of Texas – San Antonio

## All Other Minority-Serving Institutions

- Bay Mills Community College
- University of North Carolina – Charlotte
- University of North Carolina – Greensboro

## Private Industry Partners

- Classic Industries, Inc.
- COLSA Corporation
- Controlled Rate Freezers
- Gateway Material Center
- Iris Technologies
- ManTech International Corporation
- Mighty Muscle Facilities
- NCSU Nanofabrication Facility
- Pelican Defense Technologies
- Phoenix Operations Group
- Protection Engineering Consultants, LLC
- Rheaply
- RTI International
- Research Triangle Park
- QMS Consulting
- VX Aerospace

For an updated list of our member institutions, visit us at [msrdconsortium.org/members](https://msrdconsortium.org/members)

# LET'S WORK TOGETHER

*Elevate your research and advance your mission. Tomorrow's success begins with you, today.*



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