UNIVERSITY SYSTEM of MARYLAND

3300 METZEROTT ROAD // ADELPHI, MD 20783
WWW.USMD.EDU // 301.445.2740

OFFICE OF THE VICE CHANCELLOR FOR RESEARCH AND ECONOMIC DEVELOPMENT

USM Board of Regents
Committee on Research and Economic Development
May 6th, 2025
Zoom

AGENDA **10:30 a.m. – Noon**

Call to Order **Bill Wood**

10:30 a.m. to 10:35 a.m.	Welcome and Approval of the minutes	Regent William Wood
10:35 a.m. to 10:50 a.m.	USM Research and Economic Development Update	Vice Chancellor for Research and Economic Development, Dr. Michele Masucci
10:50 a.m. to 11:25 a.m.	Research Report for University of Maryland Eastern Shore	Dean of the School of Agricultural and Natural Sciences, Dr. Moses T. Kairo
11:25 a.m. to 11:45 a.m.	Mid Atlantic Quantum Alliance	Executive Director and International Engagement Workgroup Co-Lead, Dr. John Sawyer
11:45 a.m. to 11:55 a.m.	xFoundry NEXPLORE Summit	Co-Founder and Executive Director of xFoundry, Amir Ansari
11:55 a.m. to 12:00 p.m.	Closing Remarks	Regent William Wood

USM Board of Regents Research and Economic Development Committee Minutes for March 20th, 2025

Call to Order: Regent Wood called the meeting to order of the University System of Maryland Board of Regents Committee on Research and Economic Development to order in public session at 10:31am on Tuesday March 20th, 2025, via Zoom.

In attendance:

Panelists: Michele Masucci, Bill Wood, Denise Wilkerson, Ellen Herbst, Julia Chadwick, Bill Dennison, Lindsay Ryan, Alison Wrynn, Jay Perman, Ralph Mueller, Anwer Hasan, Elena Langrill, Mike Ravenscroft, Harry Coker Jr., Ralph Mueller

Audience: 28 attendees in the audience.

Agenda:

1. **Approval of Minutes.** Regent Wood noted that we did not have a quorum to approve the minutes from the January 31 meeting of the Board of Regents Committee on Research and Economic Development. The Committee agreed to vote on the meeting minutes at the next full Board meeting in April

2. **Federal Research Landscape Update.** Vice Chancellor Masucci presented an update on the current federal research landscape to the committee. During the presentation, the committee discussed challenges in federal research funding, including delays and communication issues, but noted an overall increase in grant applications across USM, aided by new technologies. All meeting materials are available to the public on the USM website.

3. **Research Report for University of Maryland Center for Environmental Science.** Vice President Dennison gave a detailed report on the University of Maryland Center for Environment Science research ventures over time. Updates included facility expansions, citizen science initiatives, major research funding, and steps toward achieving higher research status. Dr. Dennison emphasized UMCES's growing role in addressing environmental challenges especially. Additionally, he recognized UMCES's 100-year anniversary and its historic contributions to environmental science, including numerous books, groundbreaking science, and a century of collaboration with local and federal partners. All meeting materials are available to the public on the USM website.

4. **Momentum Fund Update.** Mike Ravenscroft, Managing Director of the Maryland Momentum Fund, gave a presentation on the fund before the committee. An update on the Maryland Momentum Fund was provided, covering recent investments, company progress, and the Venture Fellows Program. The Chancellor asked that the Maryland Momentum Fund work with Vice Chancellor of Communications and Marketing Michael Sandler to create a strategy to communicate the benefits and impacts of the Venture Fellows program. All meeting materials are available to the public on the USM website.

5. **Major Programs and Resources for Commercialization and External Engagement Report Outs from working groups.** Executive Director of Economic Development Lindsay Ryan gave a presentation on the USM External Engagement Task Force before the committee, as well as the USM Innovation Collective. She highlighted the task force's findings to boost Maryland's competitiveness through initiatives in climate innovation, cybersecurity, AI, and quantum technologies.
   She also updated on the USM Innovation Collective, a network of fund managers and venture specialists across USM's economic development offices, which supports startup growth. She reported USM adds about 180 startups annually, a third led by students, and

offers over 23 resources, including funding and training. Impact metrics and growth data were shared. All meeting materials are available to the public on the USM website.

Action items:

1) Minutes from the 1/31/202 RED Committee meeting were unable to be approved due to a lack of quorum, approval postponed to the next full board meeting.
2) The Chancellor tasked Mike Ravenscroft with working with Vice Chancellor Michal Sandler and his team to better communicate the benefits and impacts of the Venture Fellows Program.

Adjourned: Regent Wood gave his closing remarks and adjourned the meeting at 12:04 p.m.

USM Venture Development Report

Prepared by: Lindsay Ryan, Director of Economic Development
May 6, 2025

University System of Maryland

Notes and Trends
July - December 2025

- Typical seasonal fluctuations, with spring seeing most activity

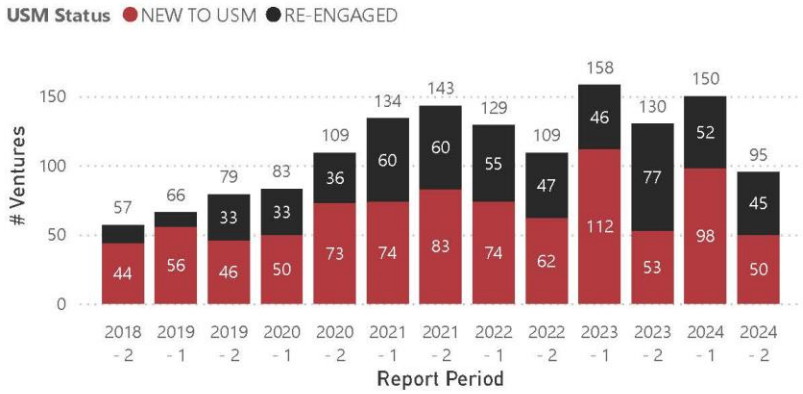
- Decrease in amount and number of ventures capitalized generally due to variability in related programming, with some impacts due to the general investment environment.

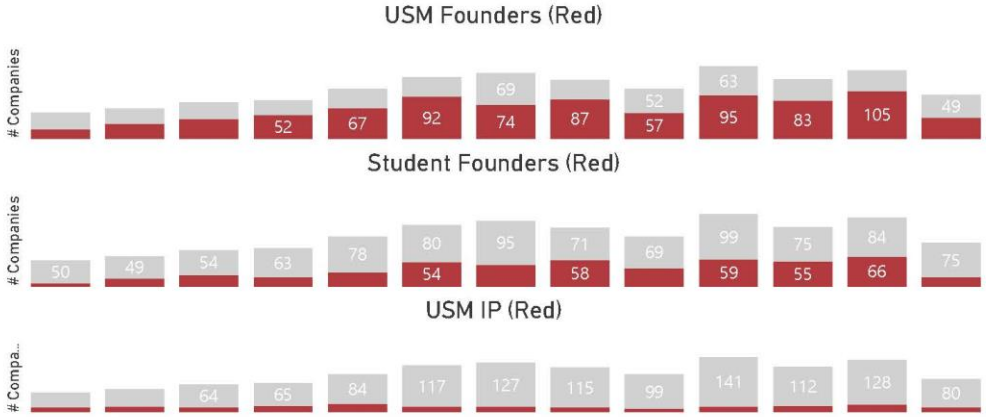
University System of Maryland

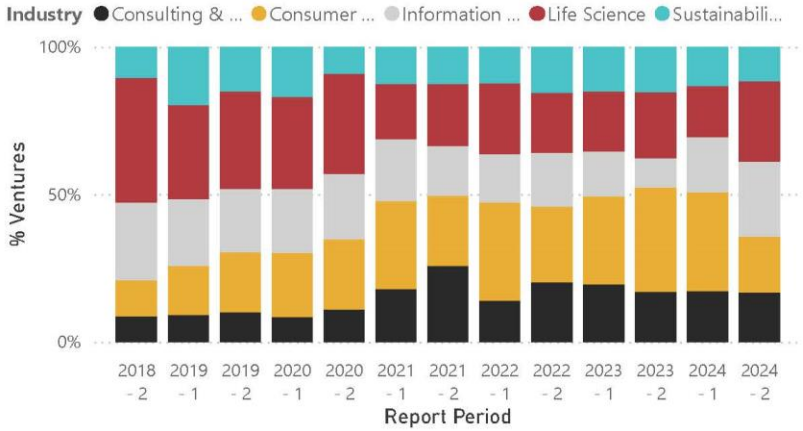
Ventures Supported

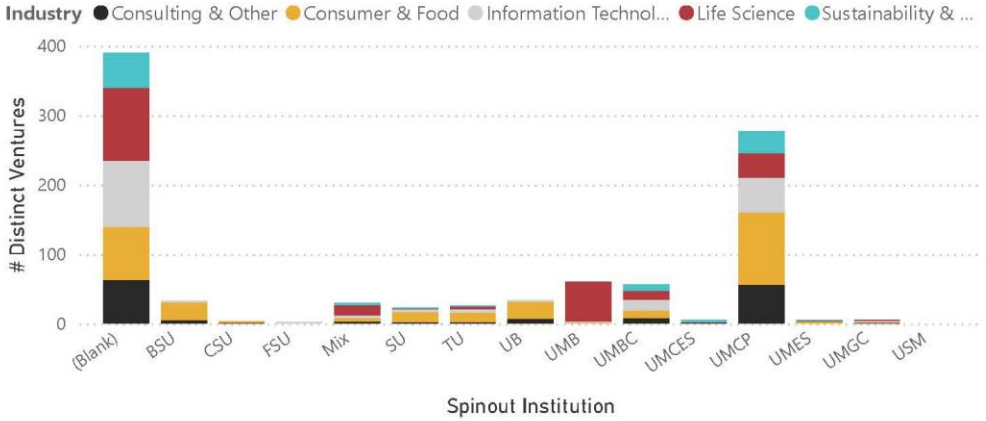
USM Status: All

Report Period: All







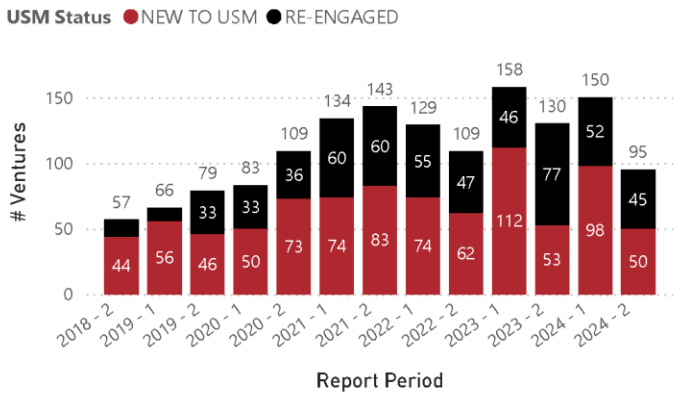


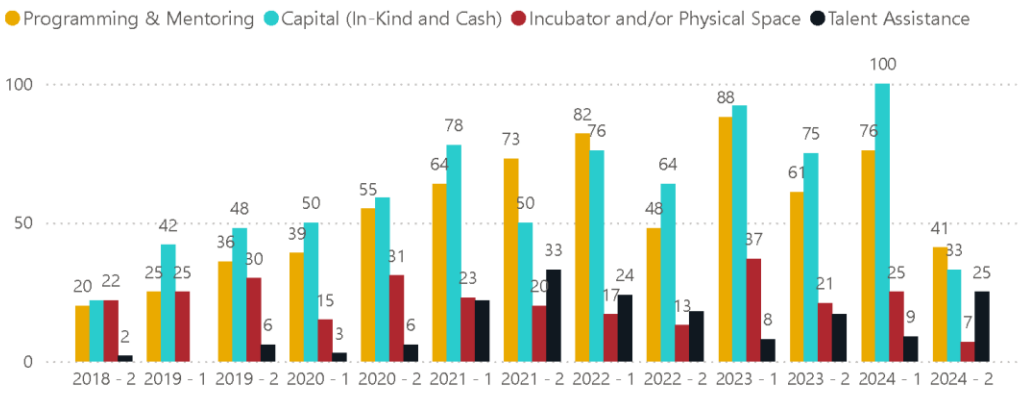
University System of Maryland

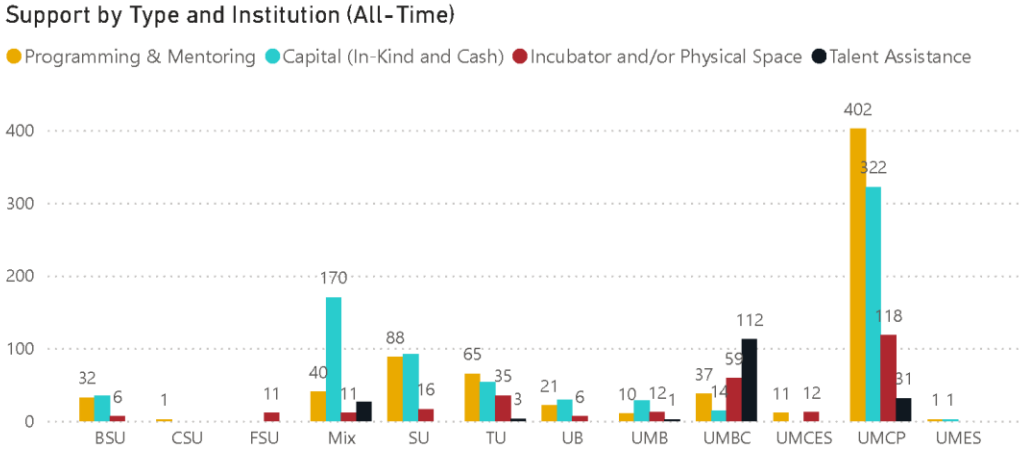
Ventures Supported

USM Status: All

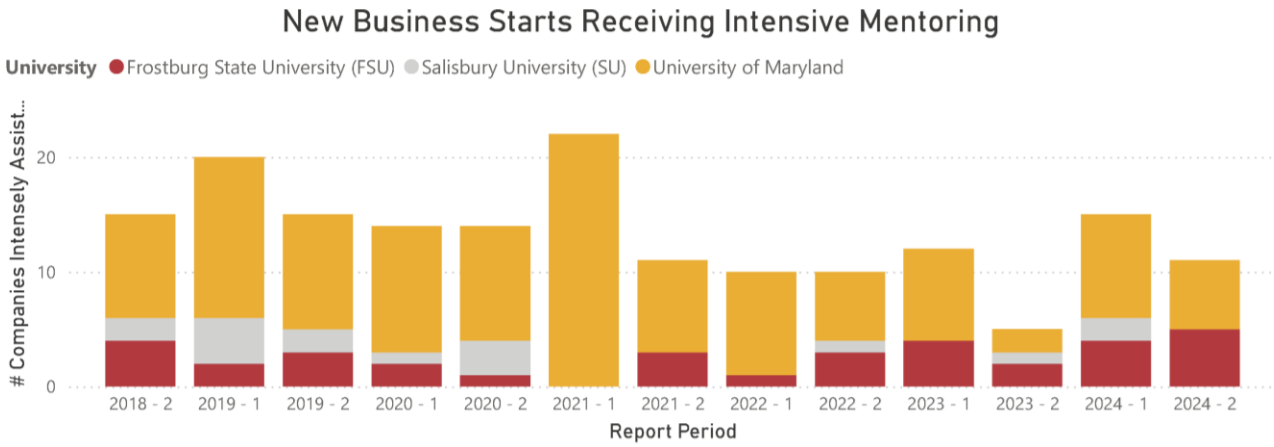
Report Period: All

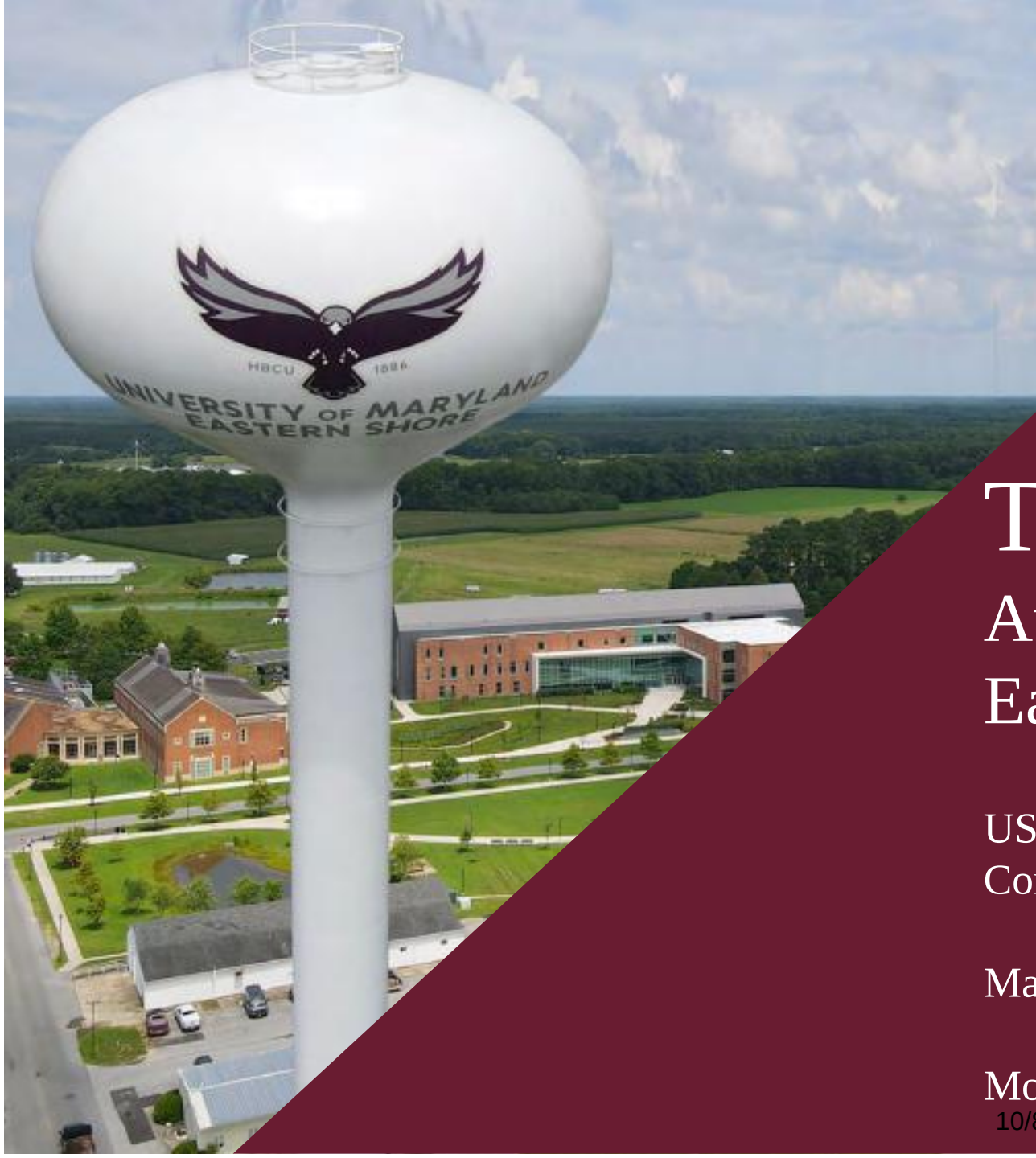






The Maryland Small Business Development Center (SBDC) is a public-private partnership between the U.S. Small Business Administration, the State of Maryland and UMCP. The Maryland network hosts entrepreneurial assistance programs at a number of USM institutions.





UNIVERSITY OF MARYLAND EASTERN SHORE

The Research Enterprise

At The University of Maryland Eastern Shore

USM Board of Regents
Committee on Research and Economic Development

May 6, 2025

Moses T. Kairo

Strongly Rooted in the Land Grant Mission of Teaching, Research and Extension

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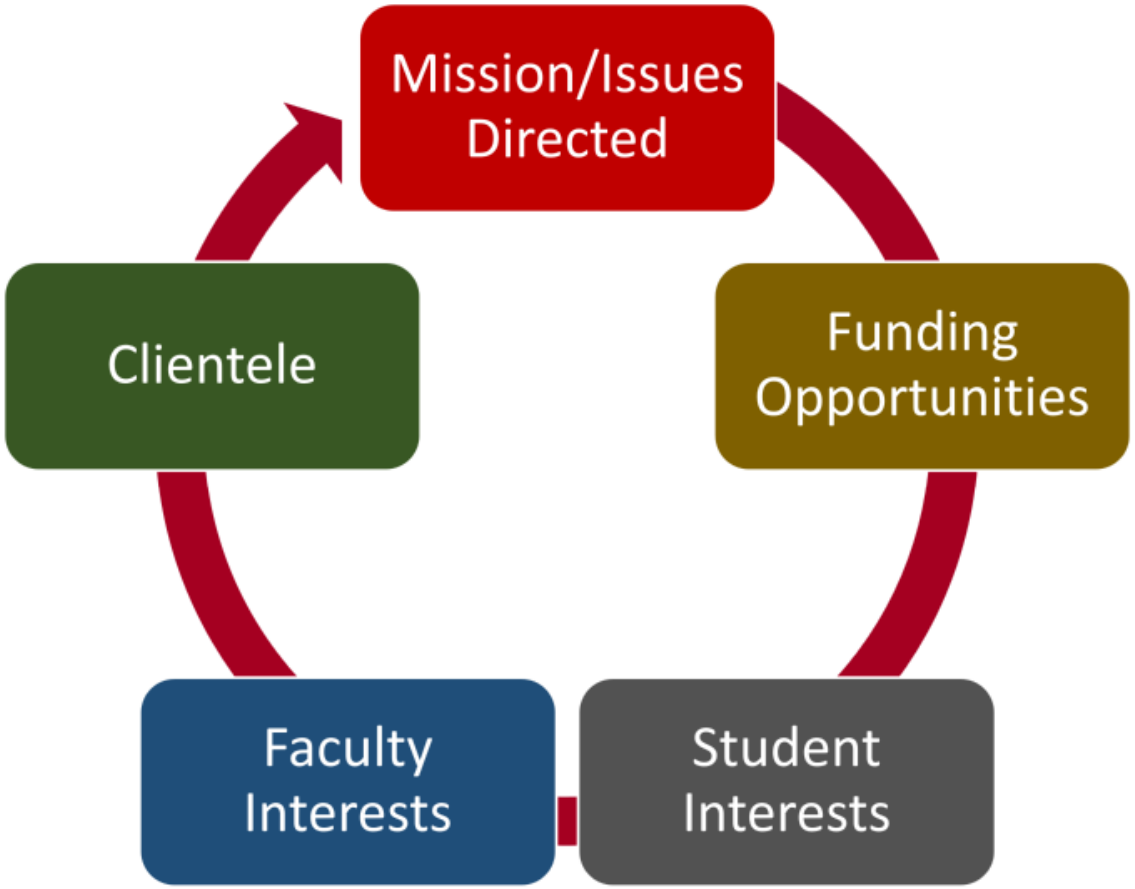
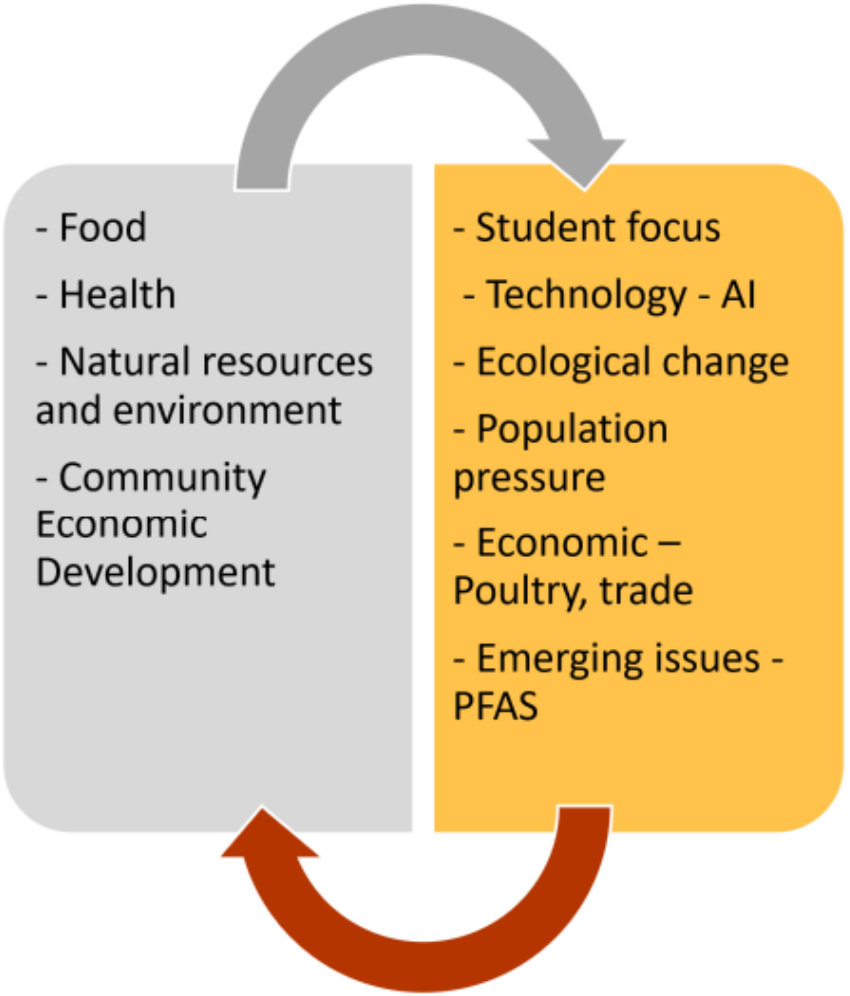
2025

135th Anniversary Commemoration of the Second Morrill Act of 1890

Soaring Above and Beyond

Major Research Drivers – Why and for Whom





Scope and Focus

Local

National

Global

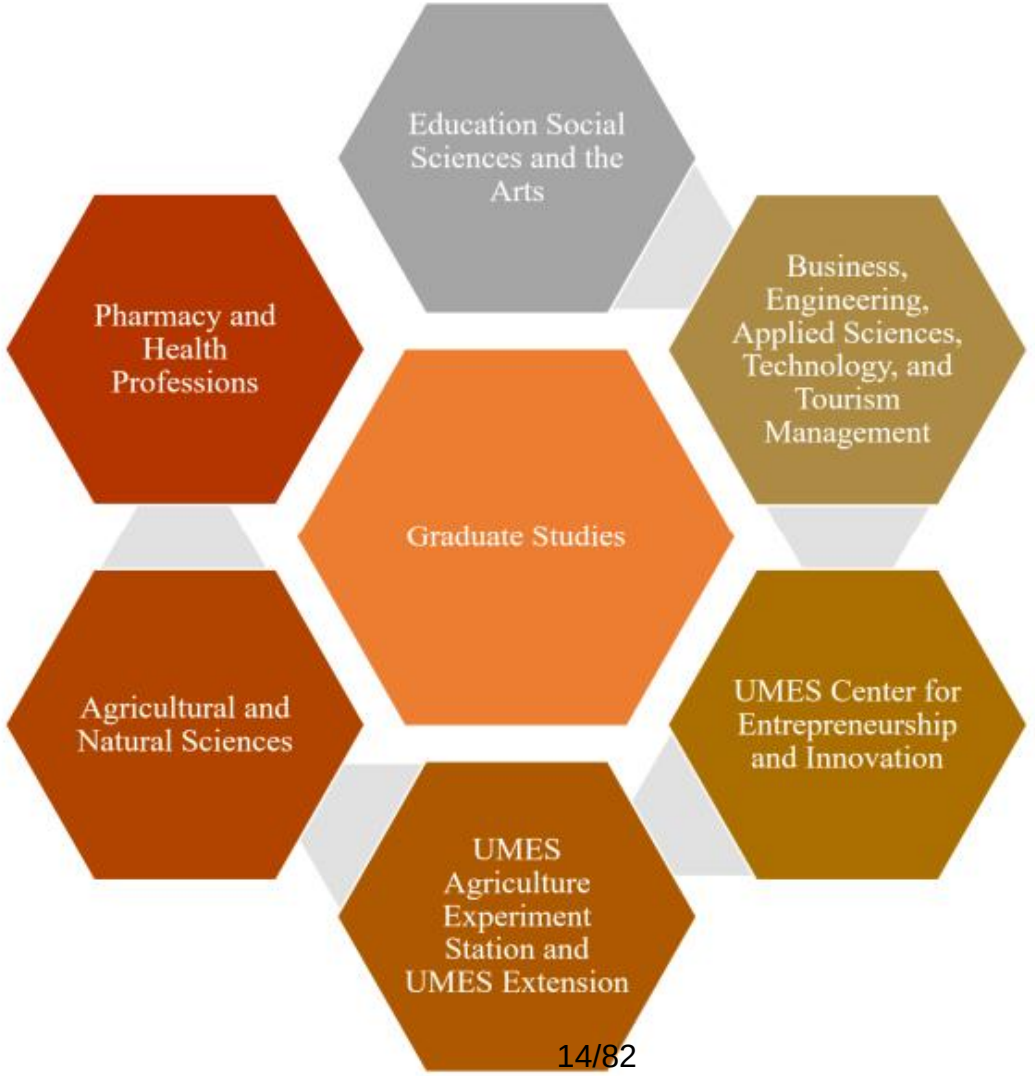
Space

Research at UMES – An Integrative Activity Linked to Undergraduate and Graduate Student Experience

UNIVERSITY OF MARYLAND EASTERN SHORE

M.S and/or Ph.D.

- Pharmaceutical Sciences
- Marine Estuarine and Environmental Sciences
- Food and Agricultural Sciences
- Toxicology
- Applied Computing and Engineering
- Organizational Leadership



M.S

- Chemistry
- Human Ecology
- Applied Computer Science
- Cybersecurity Engineering Technology
- Data Science and Analytics Engineering
- Electrical and Mechanical Engineering
- Criminology and Criminal Justice

Food and Agriculture

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Food Safety and Quality
Center for Food Safety, Science and Technology

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- Supporting the Delmarva poultry, seafood and fresh produce Industry
- Food Safety and development of healthy foods
- Workforce development

Food Safety
Researchers: Drs. Parveen and Hashem

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Overall Goal:

- Improve the safety and quality of seafood, poultry, meat & fresh produce quality

Research Objectives:

- Development and application of rapid methods for Detection of water and foodborne pathogens
- Genotypic and phenotypic methods for Microbial source tracking of food, soil and water-borne pathogens
- One Health Approach to understanding the Ecology, growth, survival and persistence - pathogens in food
- Antibiotic resistance, virulence properties, pathogenicity and genomics/metagenomics of *Vibrio*, *Salmonella*, *Listeria* and STEC
- Controlled Environment Agriculture: Greenhouse, aquaponics & hydroponics; Integrated Crop Livestock Farms (ICLFs): Animal grazing on cover crops, food safety of fresh produce, and soil health.







Major Activities and Impacts

- Funding: >$35M
- Established: Collaboration, laboratories, research program Trained: >300 students, educators, scientists, 20 technicians & postdoctoral associates
- Graduated: >25 Ph.D. >14 M.S. & >100 B.S. students
- Developed: Predictive models, methods for tracking sources of contamination, detection and reduction of bacteria, control ammonia emission in poultry, effects of manure application on fresh produce safety; Filled: data gap for national (FDA, MDE & industry) & international (WHO & FAO) risk assessment
- Technology transfer: Seafood, produce, and poultry industries; state and regulatory agencies (industry, FDA; WHO and FAO)
- Published: >100 refereed journal articles, multiple book chapters, >200 abstracts & presentations; >100 invited presentations & >60 popular press & reports
- Awards: Outstanding accomplishments, technology transfer
- Outreach/extension/education programs

Collaborators and Funding Agencies

- **National:** J. Schwarz, P. Chigbu, J. Dhakal, C. Cotton, L. Marsh, A. Allen, J. Pitula, B. Min, C. Nindo, B. Khatabi, M. Schwarz, J. Timmons, E. May, E. Escobar **(UMES)**; G. Richards, P. Millner, M. Sharma, C. Hapeman, P. Fratamico, Yanhong Liu **(USDA ARS)**; D. Hively **(USGS);** G. Ozbay, C. Kim, H. William, J. Lee, V. Chhetri, A. Kilonzo-Nthenge **(1890 Schools)**; A. Pires, C. Gomaes, J. Izursa**,** A. Sapkota, A. Islam, K. Kniel, D. Biswas, M. Jahncke, D. Webster, S. Micallef, C. Liu, E. McLamore, H. Li **(1862 Schools)**; K. Brohawn, A. DePaola, J. Bowers, J. Jacobs, H. Townsend, C. Grim, N. Hasan, M. Tarnowski **(MDE, DNR, FDA, NOAA, Industry**);

  >300 Technicians/postdoctoral associates/educators/scientists and graduate and undergraduate students
- **International**: M. Tamplin (Australia); V. Cleide and M. Miotto (Brazil); M. Fu (China), A. Abdelhafez (Egypt) and B. Amin (Bangladesh)
- **Industry & others:** Perdue Poultry Industry, Seafood Industry, Produce Industry, local farmers
- **Funding Agencies:** USDA-ARS, NSF, NOAA, LMRCSC, USAID and multiple industries

Crop Agriculture: Smart Agriculture, Expanding Market Opportunities for Farmers (Large Research and Extension Team)

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- Row Crops – Smart Agriculture
  - Precision application of nutrients and water
- Specialty Crops
  - Development of specialty crops to provide market alternatives for farmers
  - Value added – development of unique products from crops such as antifouling paints

USDA

New Economic Opportunities for Maryland Farmers: New Crops / Addressing Existing Challenges

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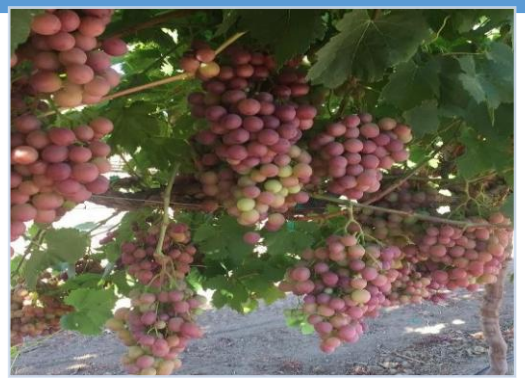
Grapes



Quinoa

Industrial hemp

Grapevine Research Program

Researcher: Dr. Sadanand Dhekney

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Focus: Conventional breeding, precision breeding and genome editing to improve disease resistance (powdery mildew) and quality traits such as improved berry colors, decreased browning and seedlessness

Field Establishment

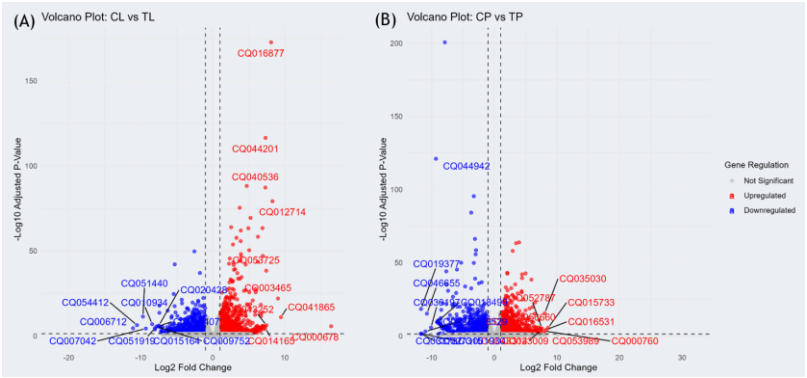
Screening for powdery mildew resistance and quality traits

Quinoa Research Program

Researcher: Dr. Sadanand Dhekney

Focus: Screening quinoa genotypes for yield and stress tolerance on Maryland's Eastern Shore and identifying differentially expressed genes to heat stress for developing heat tolerant cultivars

Field Screening of Quinoa Genotypes for Yield and Abiotic Stress Tolerance



Differential Gene Expression Analysis

Industrial Hemp Research Program

Researcher: Dr. Sadanand Dhekney

Focus: Screening industrial hemp cultivars for Maryland's Eastern Shore and development of propagation technologies for production of high quality, disease-free plant material

Indoor Hemp Germplasm and Field Evaluation of Genotypes

Micropropagation for Disease-Free Plant Production

UMES Center for Integrated Pest Management
Researchers: Dr. Simon Zebelo and Team

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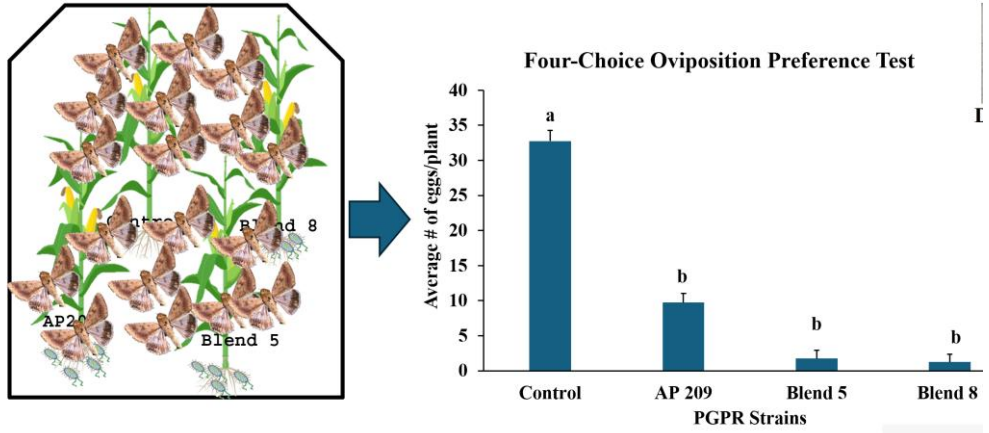
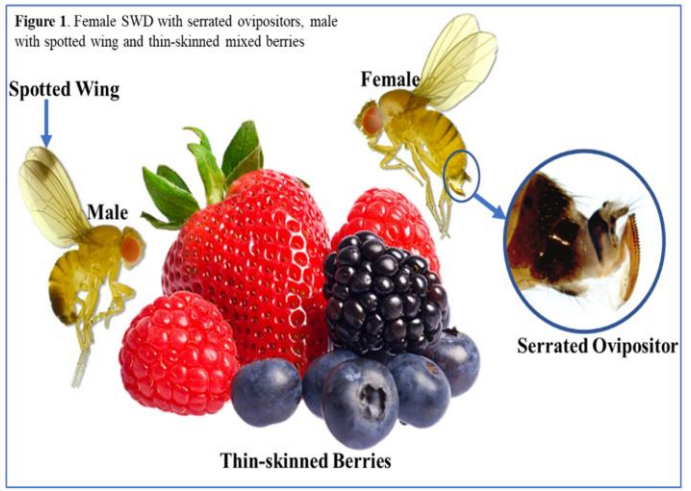
Focus:

- Development and dissemination of pest management solutions for Maryland's crops and invasive insects
- Coordination of the IR-4 Project Northeast Region - a USDA-funded national research program that facilitates the registration of safe and effective chemical and bio-based pesticides for fruits, vegetables, herbs, nuts, ornamentals, and other specialty crops and for minor uses on major crops like corn, soybean, cotton, wheat, and other small grains.

Plant Growth Promoting Rhizobacteria (PGPR) Mediated Sweet corn-insect interactions



Developing and Implementing Green Pesticides to Monitor and Manage the Invasive Spotted Wing Drosophila (SWD) in Berry Production



IR-4 Project

USDA

Artificial Intelligence

AI for Agricultural Resiliency for Small Farm Systems
Researcher: Dr. Nazia Arbab

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Spatial Economic Decision Support (SEDS) Tool to Aid in Sustainable Agritourism	• Formalize, record, and refine agritourism decision-making process. • Access agritourism information to improve farm profitability, consumer experience and policy making.
Making Smart Decisions with Enterprise Budgets	• Forecasting economic variables for a farm enterprise. • Assist to make short and long-run decisions on a individual farm enterprise basis.

Data Driven Automation and AI

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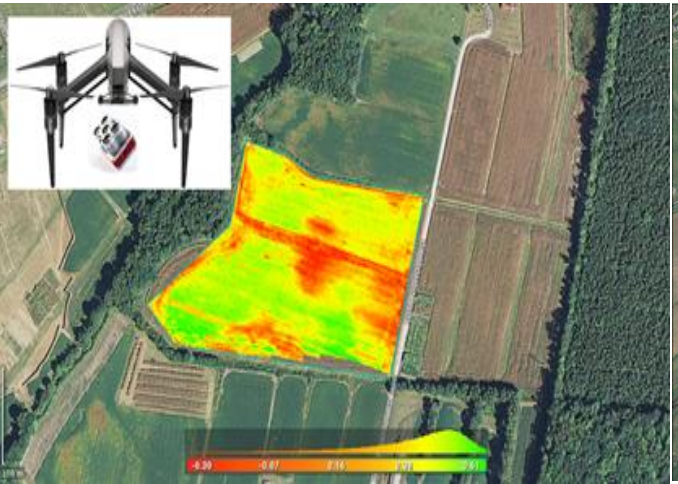
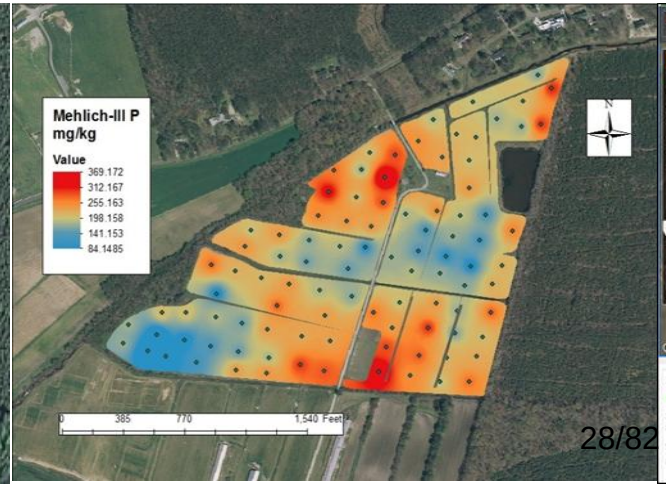
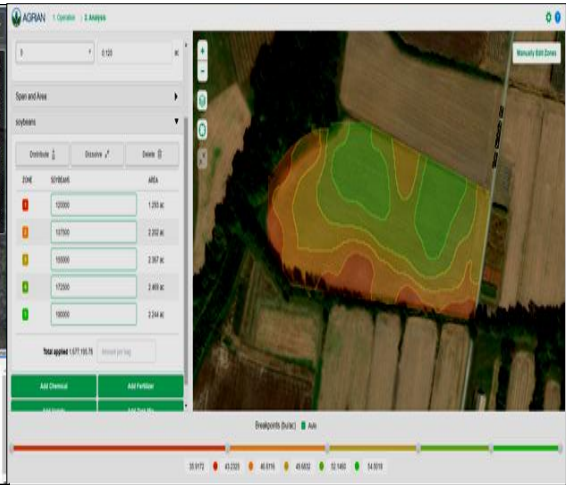
- Nutrient and water (weed) management for annual crops (Corn, Soybean, Wheat)
- Integration of automation, remote sensing and geospatial information technologies, subsurface drip irrigation, semi-automated soil sampling for smart agriculture and precision farming.
- Digital data fusion and predictive analytics aligned with sense, infer, act, and learn paradigm
- Data science, AI, ML, and DL to process digital data from several sources at different spatial and temporal resolution to provide farm management decisions that are climate resilient and maximize productivity and profit while minimizing environmental footprint
- Provide educational support and outreach activities







AI Synergistic Projects
Researchers: Dr. Nagchaudhuri and Colleagues

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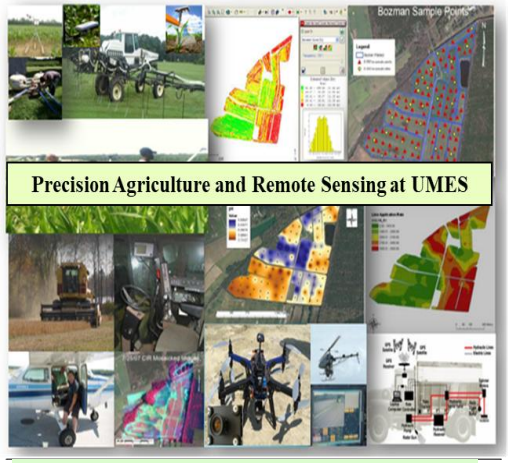

AIRSPACES

Approach

1.Sense: Sensors gather data on environmental conditions, plant health, and resource usage within the farming environment.

2.Think: AI processes this data to identify patterns, predict outcomes, and recommend adjustments

3.Act: Automated systems implement the recommended changes, such as adjusting irrigation or modifying temperature settings.

4.Learn: The system evaluates the outcomes of these actions, refining its algorithms based on real-world results.

5.Repeat: The refined strategies are continually applied and adjusted, leading to continuous improvements in efficiency and yield.

ISURF_DEL

DREAM: DEVELOPING ROBOTIC EXPLORATION WITH AGROBOTS AND MOONBOTS

Supported by NASA-MSTAR

UMES Lead – Dr. Abhijit Nagchaudhuri UMD Lead -Dr. David AkinUMES

Co-I : Dr. Madhumi Mitra, UMD Collaborator : Dr. Mary Bowden

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NASA

UNIVERSITY OF MARYLAND

ARTEMIS

Human Health

Antibiotic Research Program

Researcher: Dr. Madan Kharel

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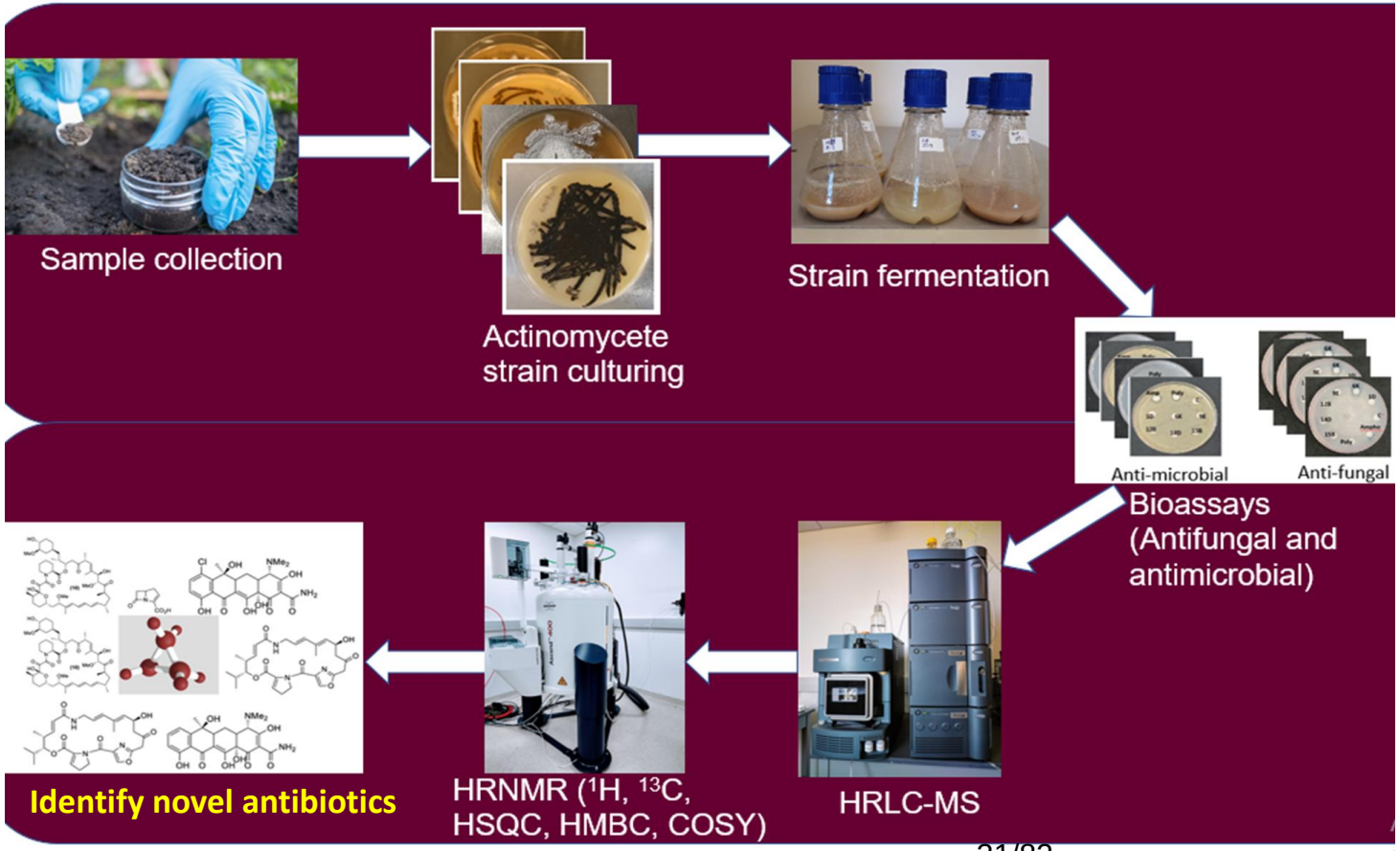
Focus: Discovery of novel antifungal and antibacterial agents



Dr. Kharel's research is sponsored by a NSF Excellence in Research (EiR) Grant.

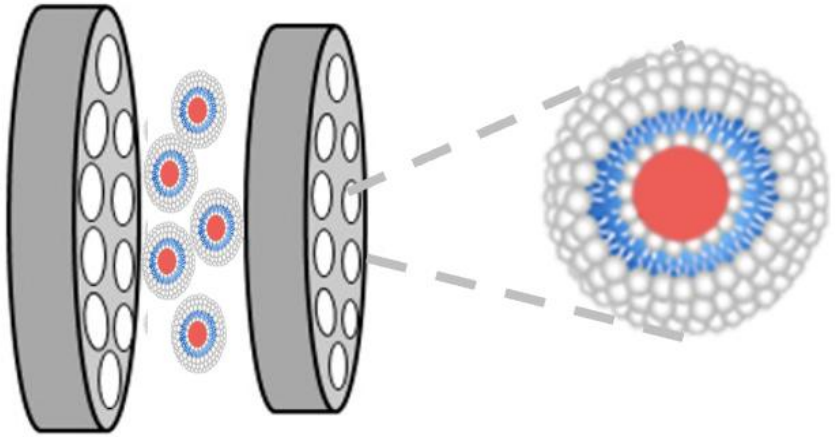
Bone Regeneration Research Program

Researcher: Dr. Jiabing Fan

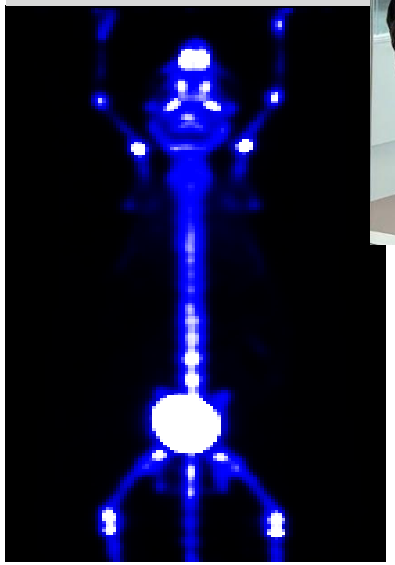
UNIVERSITY OF MARYLAND EASTERN SHORE

Focus: Develop Novel Exosome Mimetics-Based Approach for Aging-Related Bone Loss Disease (Osteoporosis) Treatment

Fabrication of Exosome Mimetics from Mesenchymal Stem Cells



PET Image for Mouse Bone Density



Dr. Fan and his research team.
Left to right: Meghna, Angela, Iram, Jiabing, Emmanuelle, Priscilla, and Sabhasis

Dr. Fan is supported by Osteo Science Foundation Grant.

Cancer Research Program

Researcher: Dr. Peter Wang

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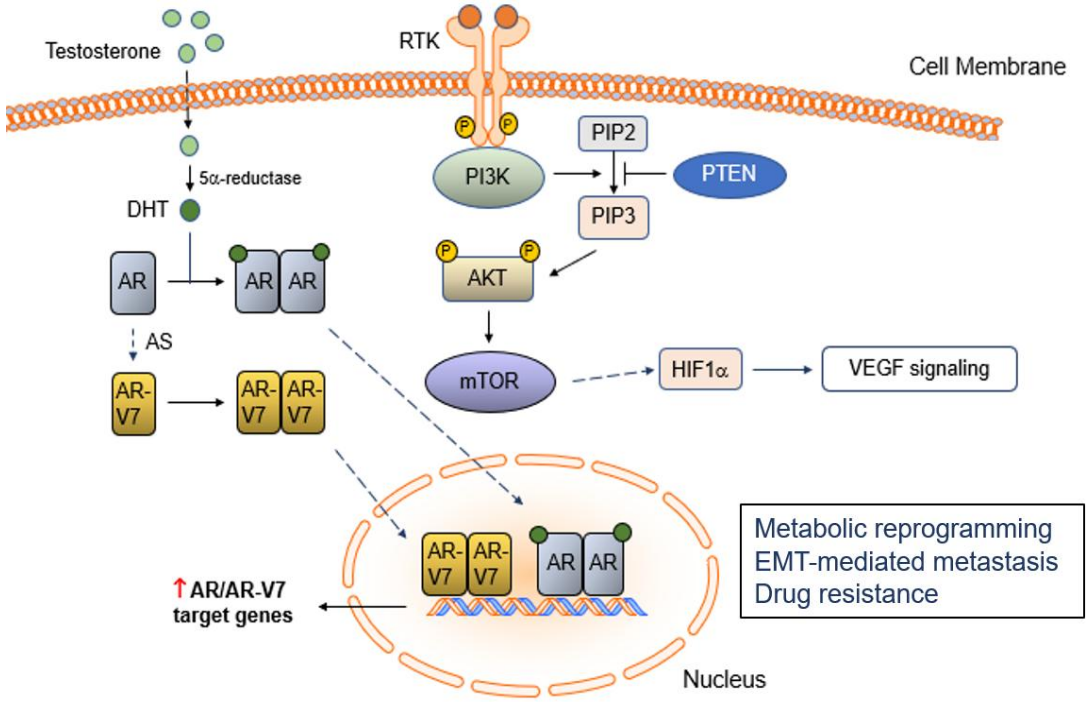
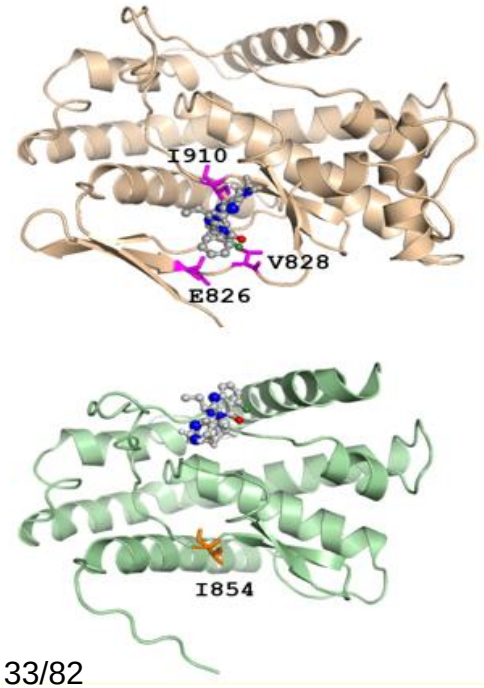
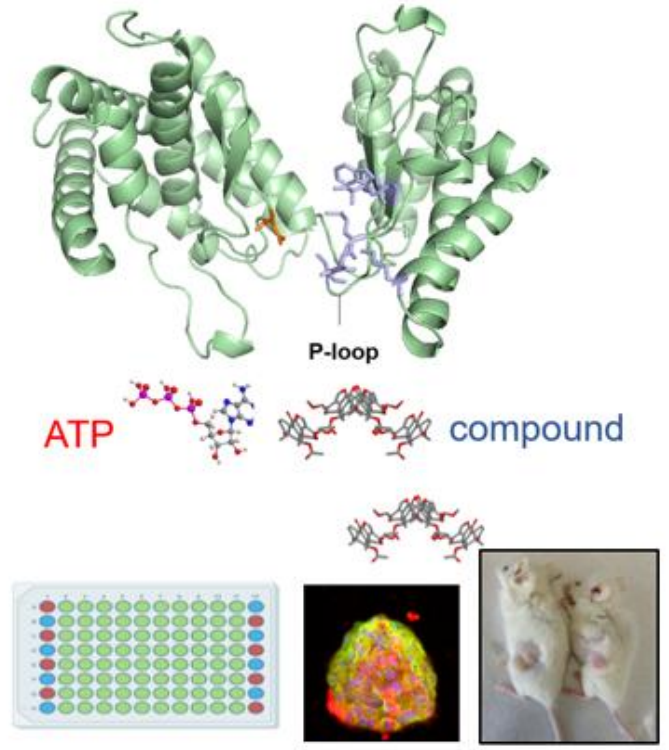
Focus: Systems biology (integrating genomics, epigenomics, and proteomics) in understanding the molecular mechanisms underlying cancer metastasis, drug resistance, and cancer health disparities.







Virology Research Program

Researcher: Dr. Victor Hsia

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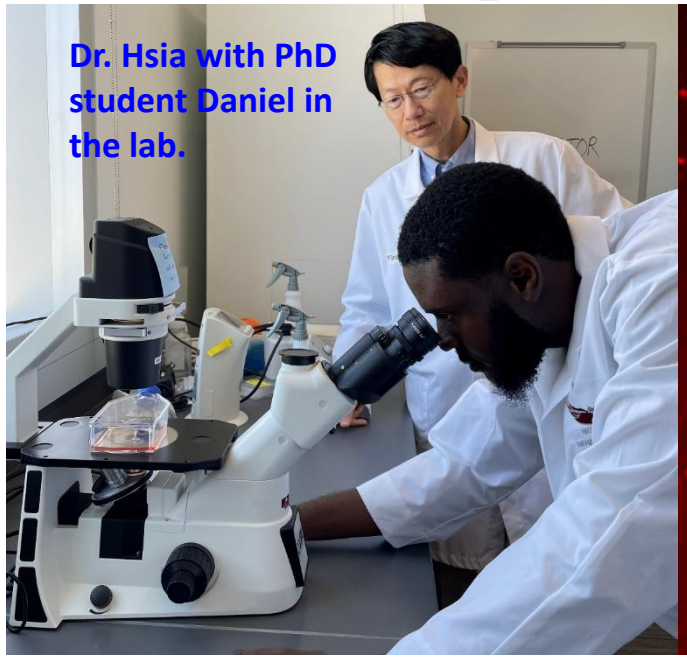
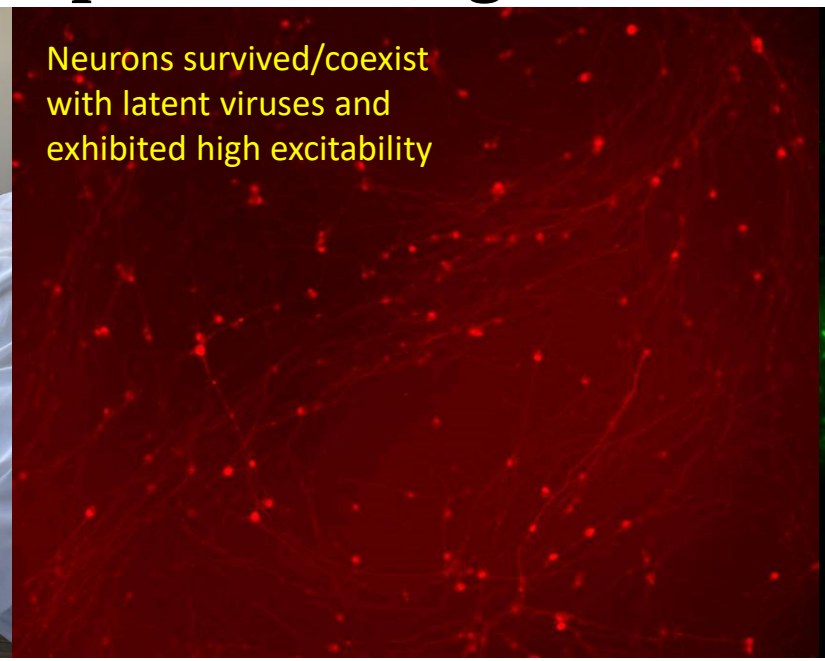
Focus: 1. Understand how neurons adapted to viral assaults.

2. Develop a safe protocol for gene delivery into brain.



Dr. Hsia with PhD student Daniel in the lab.



Neurons survived/coexist with latent viruses and exhibited high excitability

Defective virus with special enhancer generated by AI showed layer-specific gene expression in cortex

Dr. Hsia is the Principal Investigator of two NIH Grants R01NS138288 and U24MH137478.

Environment, Natural Resources and Food

Living Marine Resources Cooperative Science Center

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Geographic Focus	Investigators:Drs. Ishaque, Richardson and Chigbu	Investigators: PFAS – Drs. Pitula and Omagamre Nanoplastics – Dr. Ishaque	Investigator: Drs. Parveen, DaSilva and Chigbu
• N.E. US Continental Shelf • Chesapeake Bay • Maryland Coastal Bays • Coastal Waters of the Gulf of America	• Effects of Environmental (e.g., temperature) Changes on Abundance, Feeding, and Nutritional Quality (Fatty Acids Content) of fish & shellfish Species	• Emerging Contaminants of Concern in the Marine Environment: Perfluoroalkyl & Polyfluoroalkyl Substances (PFAS) and Microplastics & Nanoplastics	• Water Quality & Seafood Safety (e.g., Pathogenic Vibrios & *Shewanella* spp. in water, oysters & blue crabs

NOAA Educational Partnership Program with Minority Serving Institutions Cooperative Agreement
No: NA16SEC4810007; NA21SEC4810005

Emerging Contaminants of Concern – PFAS in Agricultural Ecosystems

Researchers: Drs. Pitula and Omagamre

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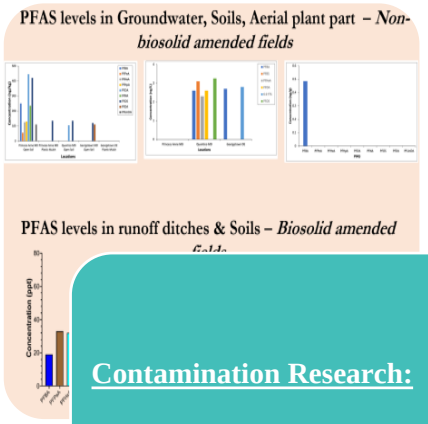
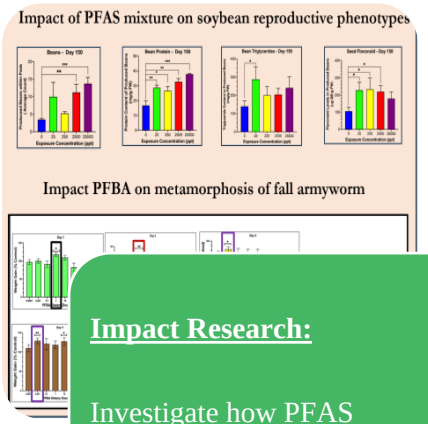
Stakeholder Engagement:

PFAS Workshop at UMES brings together, farmers researchers and regulators



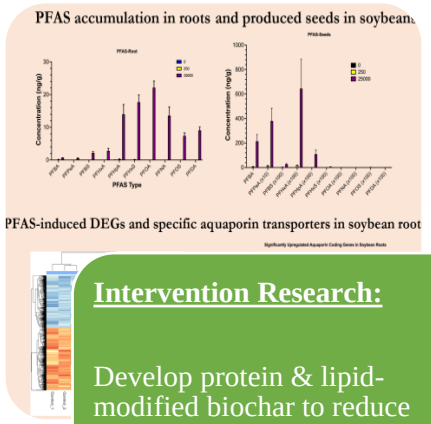
Contamination Research:

Investigating PFAS levels in groundwater, soils, runoff ditches/ponds & plant parts in farm fields



Impact Research:

Investigate how PFAS exposure & accumulation impacts crop health, productivity, resilience, pest resistance using phenotypical, biochemical & molecular approaches.



Intervention Research:

Develop protein & lipid-modified biochar to reduce soil-PFAS bioavailability

Optimize phytoremediation by identifying and overexpressing membrane transporter genes correlating with PFAS uptake and accumulation in transgenic plants

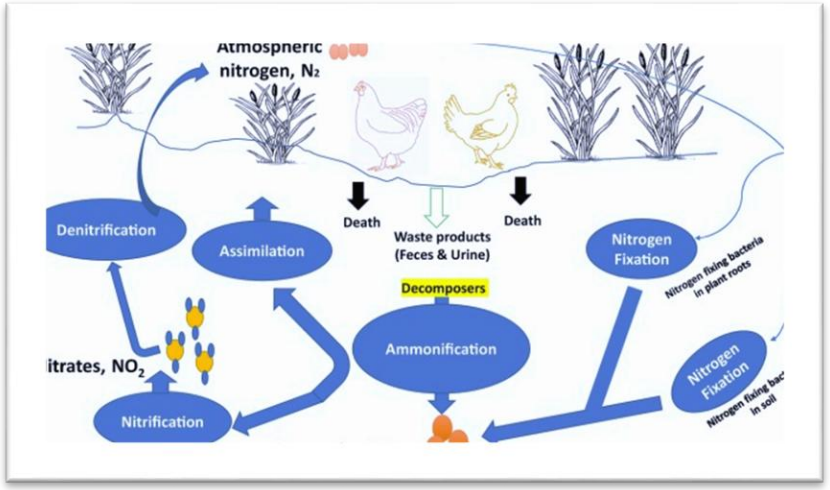
USDA United States Department of Agriculture

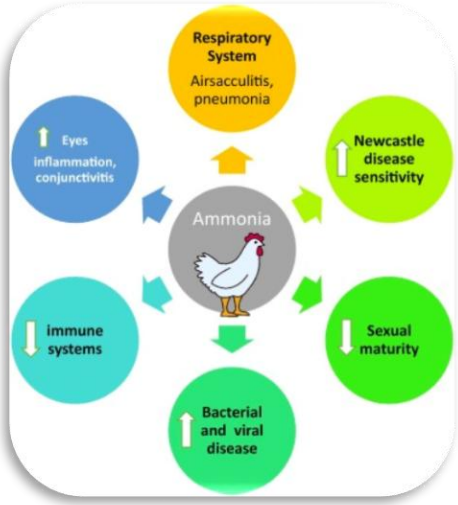
The Eastern Shore's Air Quality Dynamics and its Impacts to the Chesapeake Bay and Maryland Coastal Bay's Air Quality

Researcher: Dr. Meng Xia

UNIVERSITY OF MARYLAND EASTERN SHORE

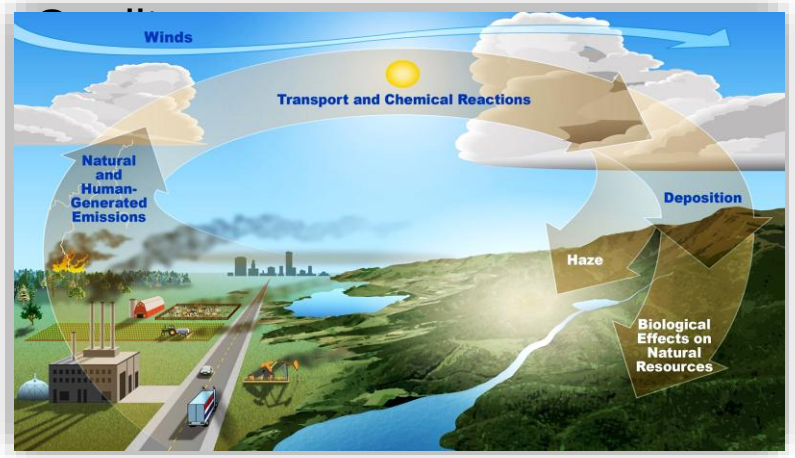
Focus: Studying the influence of air quality on the water quality of Chesapeake Bay and the Maryland Coastal Bays.





Inter-related

Air Quality ⟷ Water



https://www.nps.gov/subjects/air/sources.htm

Partners: MDE, Campbell Foundation

Value Addition in Agriculture

UNIVERSITY OF MARYLAND EASTERN SHORE

Value Addition in Agriculture: Understanding and addressing challenges to growth of agritourism.

Researcher: Dr. Prem Bandari and Team

UNIVERSITY OF MARYLAND EASTERN SHORE

- **Addressing the challenges to growth of Agritourism in Maryland including:**
  - Research on market access and marketing (of value-added produce and their destination), Regulations and liability issues, Seasonality and weather challenges, Labor (availability and management), Time management, Access to services and resources, Taxation, and Capacity building needs and training.

1890 Universities - Center of Excellence for Global Food Security and Defense

UNIVERSITY OF MARYLAND EASTERN SHORE

Broad based partnership – 19 Strong

Working across the globe

- Strengthen agricultural development
- Address new and emerging animal and plant pests and diseases
- Engage in Agricultural disaster recovery
- Workforce development

USDA National Institute of Food and Agriculture
U.S. DEPARTMENT OF AGRICULTURE

Community Economic Development
The Perch

UNIVERSITY OF MARYLAND EASTERN SHORE

Learning from Successful Revitalization Efforts

CENTER FOR ENTREPRENEURSHIP AND INNOVATION
Build a business to soar above and beyond
UNIVERSITY OF MARYLAND EASTERN SHORE

Lessons from other towns

Overview of successful case studies

Main Street Maryland workshops

Best practices are driving development of The Perch

Turning Research Into Action at ‘The Perch’

UNIVERSITY OF MARYLAND EASTERN SHORE

EDUCATION

MENTORING

NETWORKING

SHOWCASING

COMMERCE

Turning Research Into Action at The Perch

UNIVERSITY OF MARYLAND EASTERN SHORE

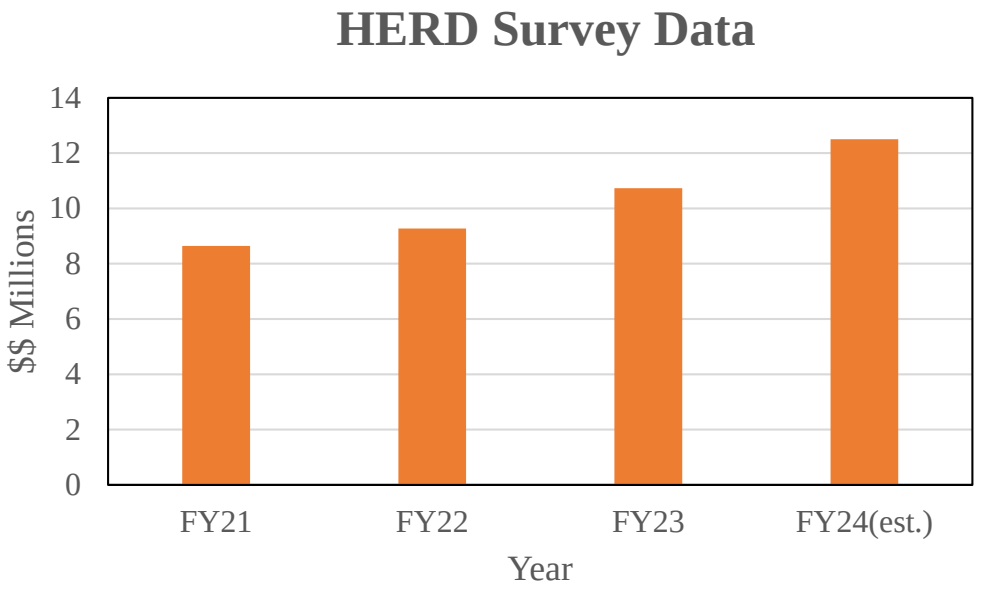
Increase in Business Ventures	30+ new businesses in the first 2 years
Job Creation	50+ new jobs in first 5 years
Revitalization of Vacant Properties	Grow & Go model

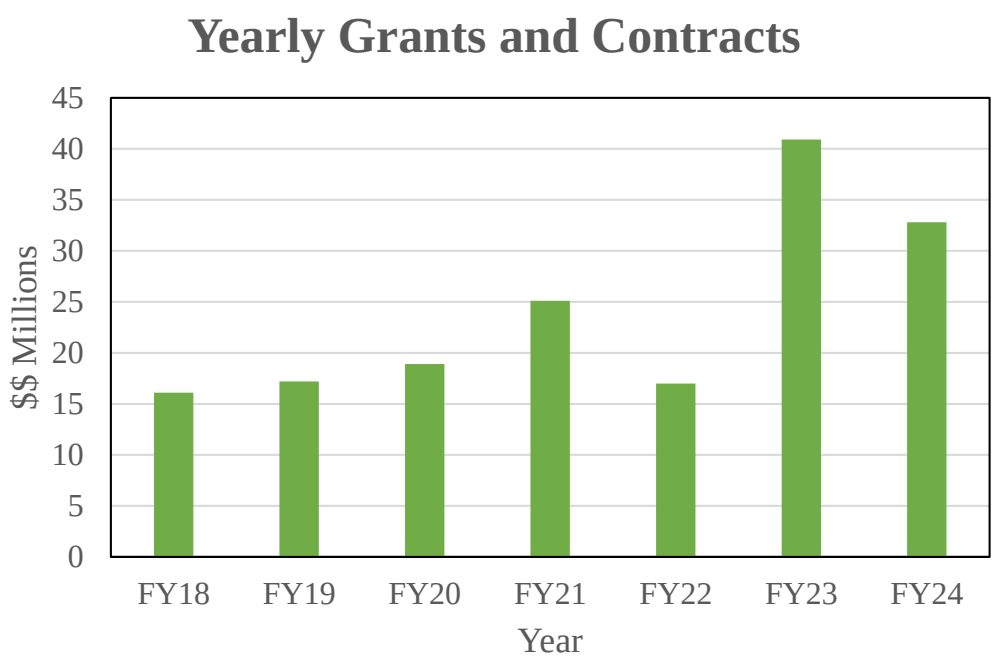
Other Research Thrust Areas

UNIVERSITY OF MARYLAND EASTERN SHORE

- Microbial ecology and utilization
- Sea level rise impacts on agriculture and forests
- Biofuel crop production
- Management of mosquitoes and vectors of Leishmaniasis in Africa
- Social science and policy research
- Artificial Intelligence/Artificial Neural Networks
- Language Learning and AI
- Evaluation of Criminal Justice/Social Work-related programming
- Etc.

UMES Research $$





Future Outlook

- New facilities such as the Agriculture Research and Education Center (AgREC) will increase capacity
- The new ***UMES School of Veterinary Medicine*** will increase the scope and breadth of expertise to address broader challenges
- The current uncertainty and upheaval in the funding space is extremely destabilizing and the impacts will have far reaching consequences on the research enterprise
- We are confident to continue undertaking great stakeholder inspired research and engagement that makes a difference




Acknowledgements

- All Funding sources – Maryland Legislature and State Agencies, USDA-NIFA, NSF, NIH, NOAA, NASA, Dept. of Ed. Dept. of Energy, MIPS, DOD Office of Naval Research, USDA-ARS, Campbell Foundation, HHMI, 1890 Foundation, Osteo Science Foundation and Others
- Numerous partner institutions.
- Stakeholders and students who inspire our work.

Soar Above and Beyond!

Moses T. Kairo, Ph.D. DIC

Professor and Dean, School of Agricultural and Natural Sciences & Acting Vice President for Research

Email: mkairo@umes.edu

Growing the Quantum Ecosystem

John P. Sawyer
Executive Director, Mid-Atlantic Quantum Alliance

UNIVERSITY OF MARYLAND FEARLESSLY FORWARD MID-ATLANTIC QUANTUM ALLIANCE

Why Quantum?

UNIVERSITY OF MARYLAND FEARLESSLY FORWARD MID-ATLANTIC QUANTUM ALLIANCE

- Great Frontier of Scientific Discovery
- Huge Economic Potential*
  - *Economic Impact by 2035: up to* $2 trillion
  - *Startups:* 350+

- National Security Priority
  - $40+ billion global investment
  - National Quantum Initiative: “whole-of-government” priority, $1-2 billion
  - CHIPS+ Act: $570 million for quantum
  - US Federal Post-Quantum Cyber Upgrades: $7.1 billion

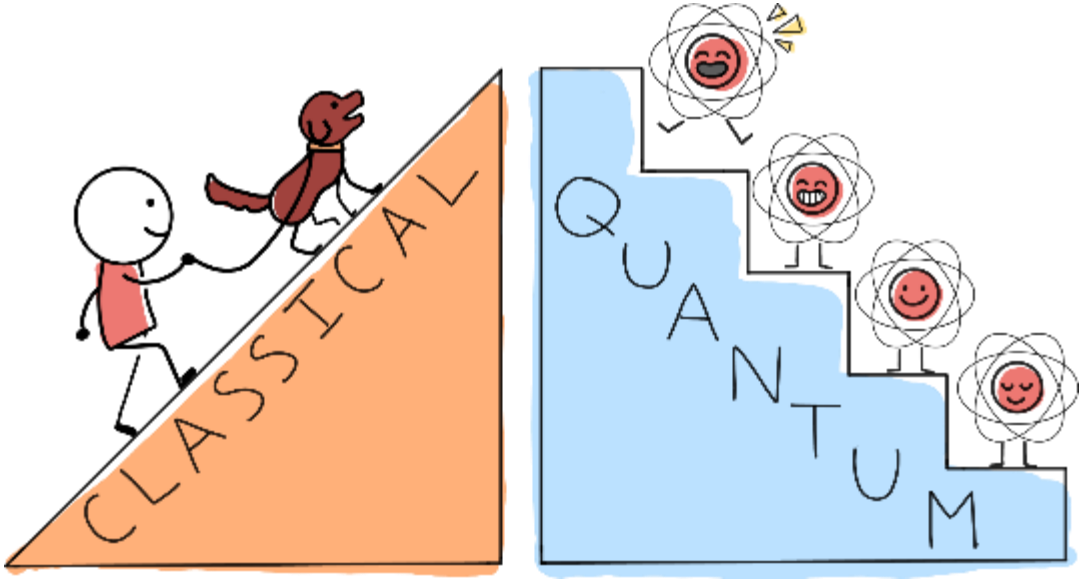
UNIVERSITY OF MARYLAND FEARLESSLY FORWARD

* https://www.mckinsey.com/featured-insights/the-rise-of-quantum-computing)

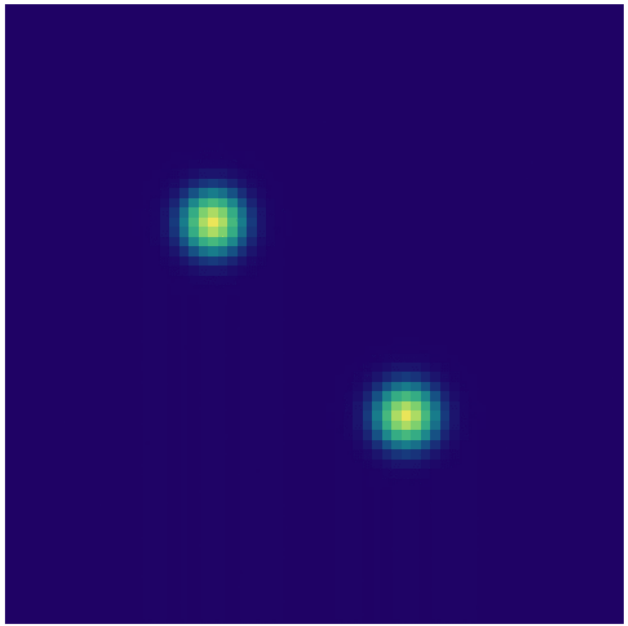
What is Quantum?

UNIVERSITY OF MARYLAND FEARLESSLY FORWARD MID-ATLANTIC QUANTUM ALLIANCE

REALLY SMALL & COLD → QUANTUM MECHANICS



Eileen Stauffer/The Quantum Atlas (CC BY-NC-SA 4.0)

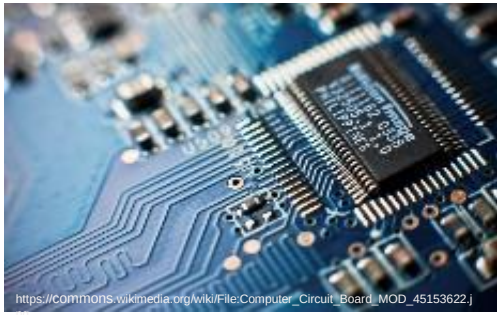


https://gfycat.com/smuguntidydonkey

1ST QUANTUM REVOLUTION: LARGE QUANTUM SYSTEMS


https://commons.wikimedia.org/wiki/File:Elektronenroehren-auswahl.jpg


https://commons.wikimedia.org/wiki/File:Transistors.agr.jpg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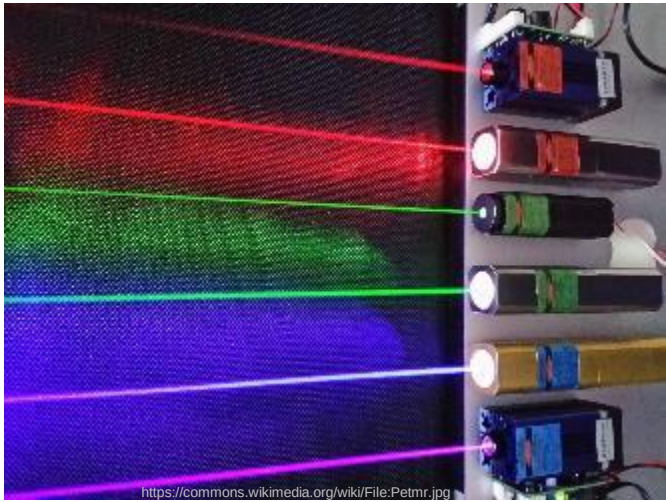
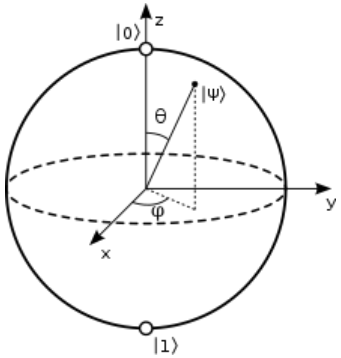
https://commons.wikimedia.org/wiki/File:NDrive_GPS.jpg


https://commons.wikimedia.org/wiki/File:Petmr.jpg


https://commons.wikimedia.org/wiki/File:Petmr.jpg

2ND QUANTUM REVOLUTION: SMALL QUANTUM SYSTEMS



Sensing

Compute

Comms

GPS-Denied Nav

Microchip Characterization

Low-Power Imaging

Biosensing

Gravitational Waves

Quantum System Simulation

Complex Optimization

Break Encryption

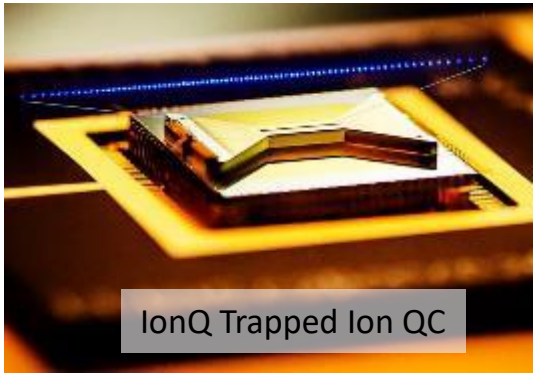
Rare Disease Modeling

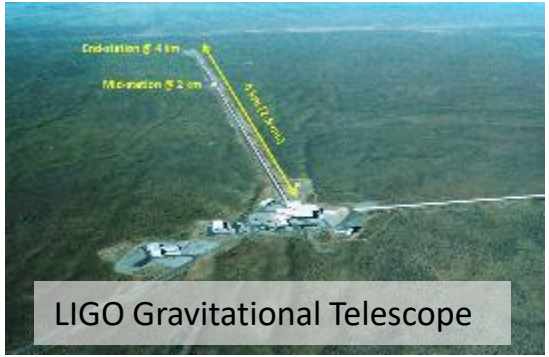
True Randomness

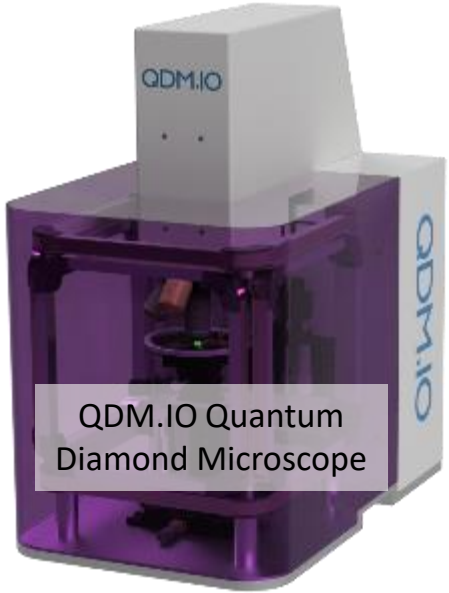
Post-Quantum Encryption

Ultra-Secure Comms

EXAMPLES

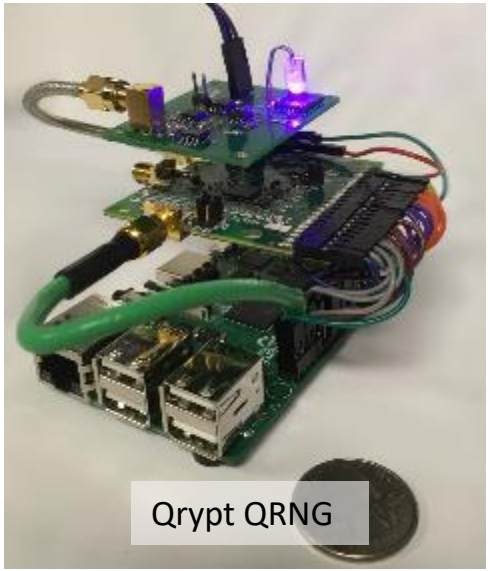

IonQ Trapped Ion QC

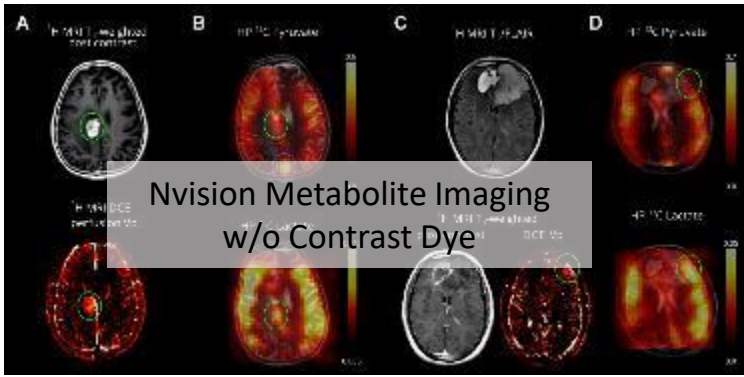

LIGO Gravitational Telescope



QDM.IO Quantum Diamond Microscope


Hyperfine Crash Cart-like MRI


Qrypt QRNG



Nvision Metabolite Imaging w/o Contrast Dye

Capital of Quantum


PITTSBURGH QUANTUM INSTITUTE
FT. DETRICK
FREDERICK NATIONAL LAB
FREDERICK
QUANTUM LOOPHOLE
MARYLAND
HARRISBURG UNIVERSITY
ARTIFICIAL BRAIN
UNIVERSITY OF DELAWARE
ASPEN QUANTUM CONSULTING
TOWSON UNIVERSITY
ABERDEEN PROVING GROUND
BEIT
BALTIMORE
QUANTUM SENSOR TECHNOLOGIES
MORGAN STATE UNIVERSITY
JOHNS HOPKINS UNIVERSITY
UNIVERSITY OF MARYLAND, BALTIMORE
You Are Entering the
"Capital of Quantum"
PROTIVITI
UMD PERSPECTIVE
FEDERAL AGENCIES AND LABS
QUANTUM COMPANIES
QUANTUM RESOURCES
UNIVERSITIES
UNIVERSITY OF MARYLAND, BALTIMORE COUNTY
NORTHROP GRUMMAN'S ADVANCED TECHNOLOGY LAB
QRYPT
JOHNS HOPKINS APPLIED PHYSICS LAB
BOWIE STATE UNIVERSITY
NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY
LEESBURG
QUANTUM COMPUTING
LESCHACK INTEGRATIONS
NATIONAL SECURITY AGENCY
WD ADVANCED MATERIALS
NATIONAL CANCER INSTITUTE
DEPARTMENT OF AGRICULTURE
QUANTUM XCHANGE
ARMY RESEARCH LAB
FOOD AND DRUG ADMINISTRATION
ERROR CORP.
KBR
AMAZON WEB SERVICES
NASA GODDARD
COLLEGE PARK
LOCKHEED MARTIN
BOOZ ALLEN HAMILTON
NATIONAL INSTITUTES OF HEALTH
UNIVERSITY OF MARYLAND
QUAXYS
LEIDOS
PERATON LABS
RIVERLANE
DEFENSE ADVANCED RESEARCH PROJECTS AGENCY
AMERICAN UNIVERSITY
AIR FORCE OFFICE OF SCIENTIFIC RESEARCH
DEPARTMENT OF HOMELAND SECURITY
MITRE
GEROGETOWN UNIVERSITY
QUANTUM AI SOLUTIONS
NATIONAL SCIENCE FOUNDATION
XANADU
DEPARTMENT OF ENERGY
THE GEORGE WASHINGTON UNIVERSITY
NORTHROP GRUMMAN
HOWARD UNIVERSITY
IBM
NOBLIS
QUANTINUUM
SMALL BUSINESS ADMINISTRATION
GEORGE MASON UNIVERSITY
DEPARTMENT OF TRANSPORTATION
DEPARTMENT OF DEFENSE
NAVAL RESEARCH LAB
OFFICE OF NAVAL RESEARCH
NAVAL SEA SYSTEMS COMMAND
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
VIRGINIA
VIRGINIA TECH INNOVATION CAMPUS
CONDENSED MATTER THEORY CENTER
DISCOVERY FUND
IONQ
JOINT CENTER FOR QUANTUM INFORMATION AND COMPUTER SCIENCE
JOINT QUANTUM INSTITUTE
LABORATORY FOR PHYSICAL SCIENCES
LPS QUBIT COLLABORATORY
MARYLAND QUANTUM-THERMODYNAMICS HUB
MID-ATLANTIC QUANTUM ALLIANCE
UNITED STATES NAVAL ACADEMY
NANOQT
NATIONAL QUANTUM LAB
ANNAPOLIS
PATERO
POTOMAC QUANTUM INNOVATION CENTER
Q-CAT
QC82
QUANTUM LEAP CHALLENGE INSTITUTE ON ROBUST QUANTUM SIMULATION
QUANTUM MATERIALS CENTER
QUANTUM STARTUP FOUNDRY
QUANTUM TECHNOLOGY CENTER
QUBIT BY QUBIT
FEARLESSLY FORWARD
NAVAL AIR WARFARE CENTER AIRCRAFT DIVISION
ST. MARY'S COLLEGE OF MARYLAND

Customers

A target-rich environment for quantum sector

- National Security / Aerospace (#1 in world)
- Cybersecurity (#1 in world)
- HPC Data Centers (#1 in world)
- Life-Sciences / BioTech (#4 in US)

Secure Supply Chain

Bulk Crystal Growth Facility

Nanofab (Class 100/1000),
Materials Growth Facility,
Adv. Materials Characterization

III-V semiconductor devices, MEMS-VCSEL lasers, quantum cascade lasers, and LiNbO3 optical modulators

Advanced Electrical Fabrication Lab

ATL Foundry (dual use): silicon, compound semiconductors & super conducting technologies; adv. packaging.

Specialty Electronic Materials & Sensors Cleanroom (Class 10/100)

CVD diamond substrates and thin films for electronics, quantum technology, and optics

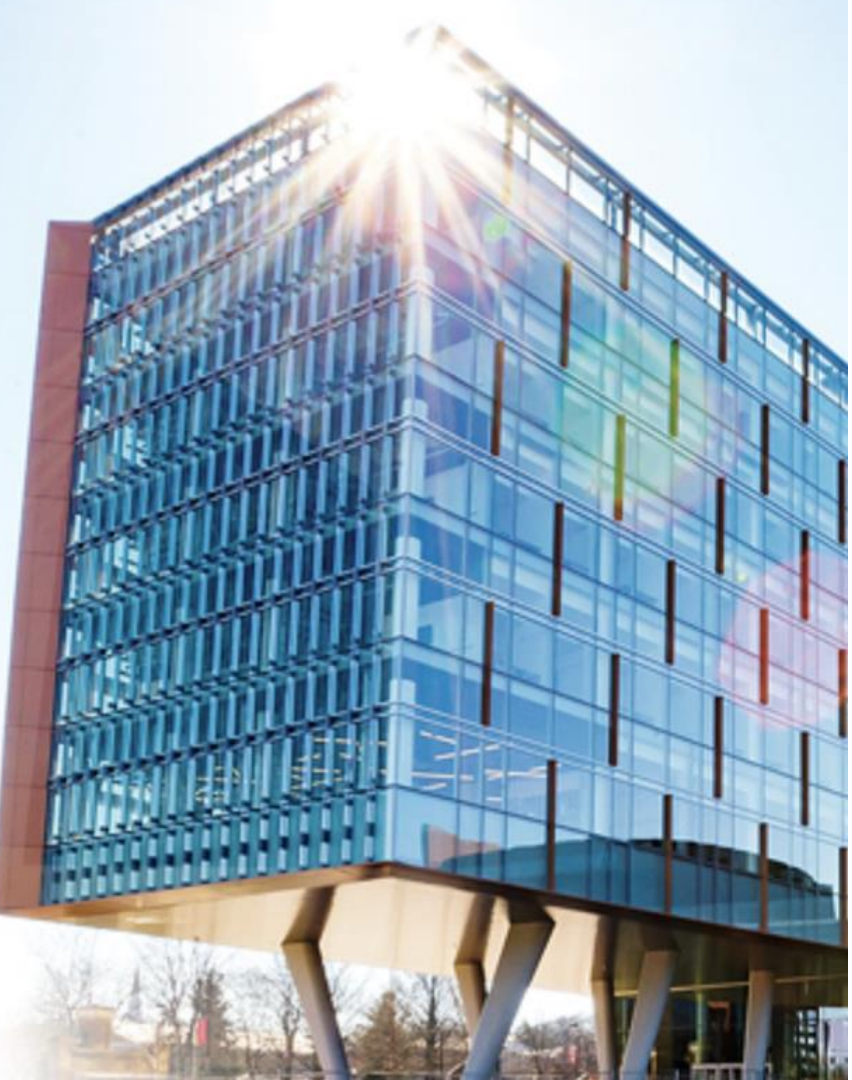
CNST Nanofab
(Class 100/1000)

Nanofab (Class 1000)
Adv. Imaging & Microscopy

Q. Materials Synthesis
Q. Materials Characterization

DRAM fabrication

Nanofabrication & Imaging Center



UNIVERSITY OF MARYLAND FEARLESSLY FORWARD

35+ Years of Quantum Research

200+ Researchers

200+ Publications Annually

#2 Among Public Institutions in Quantum Physics

100+ Graduates in 10 Years with Quantum Ph.D.s

11 Quantum-Focused Centers

1 Quantum-Focused Accelerator

1 Faculty Nobel Laureate (William Phillips)

UMD Spinout | HQ in College Park, MD | 400+ Employees | $6 Billion Valuation

MID-ATLANTIC QUANTUM ALLIANCE

mqa.umd.edu

Accelerate Quantum Innovation in the Region

- Promoting interdisciplinary, applied & translational research, commercialization efforts & impact outcomes
- Encouraging quantum RDT&E collaboration & networking
- Enabling dialog with potential end-users & customers
- Improving the visibility and accessibility of the region's world-leading quantum expertise & tech
- Identifying regional research infrastructure needs & opportunities

Build the Quantum Workforce

- Facilitating curriculum sharing & access to unique equipment/labs/expertise
- Creating shared experiential learning programs
- Elevating diversity, equity & inclusion
- Connecting / amplifying public & K-12 education campaigns

200+ Volunteers in 16 Workgroups from 48 Current Members

QUANTUM STARTUP FOUNDRY

Incubator/Accelerater Programs

TraQtion Customized access to offices & specialized facilities, equipment, talent, collaborators, etc.

Pre-TraQtion Cohort program for early stage companies & entrepreneurs

Capital Qonnections Grow & connect quantum investor network

Int'l Soft Landing Facilitate landing & growth in US market

40+ startups supported

QLab NATIONAL QUANTUM LABORATORY

- Founded in 2021 with **IonQ** as a user facility supporting the global community developing near-term, real-world computing and networking applications and talent
- Launched partnership with **Xanadu** in 2025 (others in pipeline)
- QLab provides
  - Access to advanced NISQ systems & the Mid-Atlantic Regional Quantum Internet (MARQI)
  - Expertise to optimize implementing algorithms on hardware
  - Support for interdisciplinary collaboration
  - Training & bootcamps
  - Large collaboration space inside IonQ HQ that includes large-RAM workstations to develop and test quantum algorithms
- **Personnel**: 11 Fellows
- **Director:** Franz Klein (Norbert Linke on Sept. 1, 2025)

QLab
National Quantum Laboratory

IONQ

UNIVERSITY OF MARYLAND

QUANTUM FOR ALL

QLab GLOBAL USER PROGRAM

APPLY NOW

https://go.umd.edu/3FcNYgV

Expert Collaborators
Privileged Access

Up to
$250K QPU Credits

Current Projects

QML for Medical Image Processing
Quantum Kernels for Fluid Dynamics Equations
VQE for Battery Materials Research
QML for Exploration of Topological Superconductors
Optimization of Quantum Control Engineering
Quantum Cybersecurity
Quantum Computing for Earth Science

QUANTUM LEAP CAREER NEXUS

THE PREMIERE NETWORKING, RECRUITMENT, AND MENTORSHIP EVENT

SAVE THE DATE

TUESDAY, OCTOBER 28, 2025 | COLLEGE PARK, MARYLAND

GO.UMD.EDU/1W5D
RQS@UMD.EDU

Institute for Robust Quantum Simulation

MID-ATLANTIC QUANTUM ALLIANCE

INTERNATIONAL YEAR OF Quantum Science and Technology

UNIVERSITY OF MARYLAND

Undergraduate Quantum Association

QUANTUM STARTUP FOUNDRY

Capital of Quantum Initiative

- *$1B Public-Private Partnership*
- *Reinforcing decades of leadership & investment*
- *Concentrated growth in College Park*

Quantum Placemaking in the Discovery District

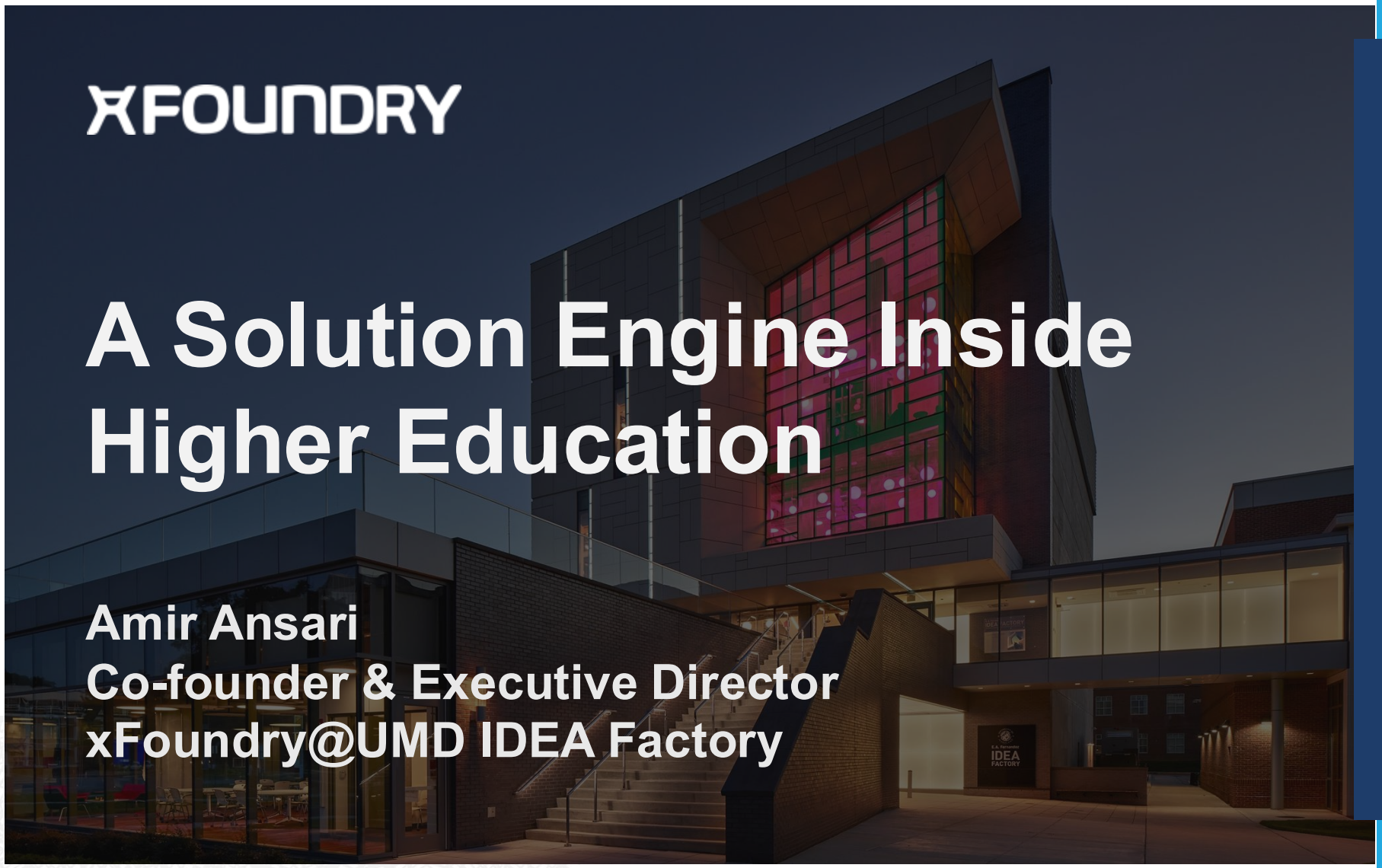
Capital Quantum Benchmarking Hub
(up to $200M over 4 years)

UNIVERSITY OF
MARYLAND

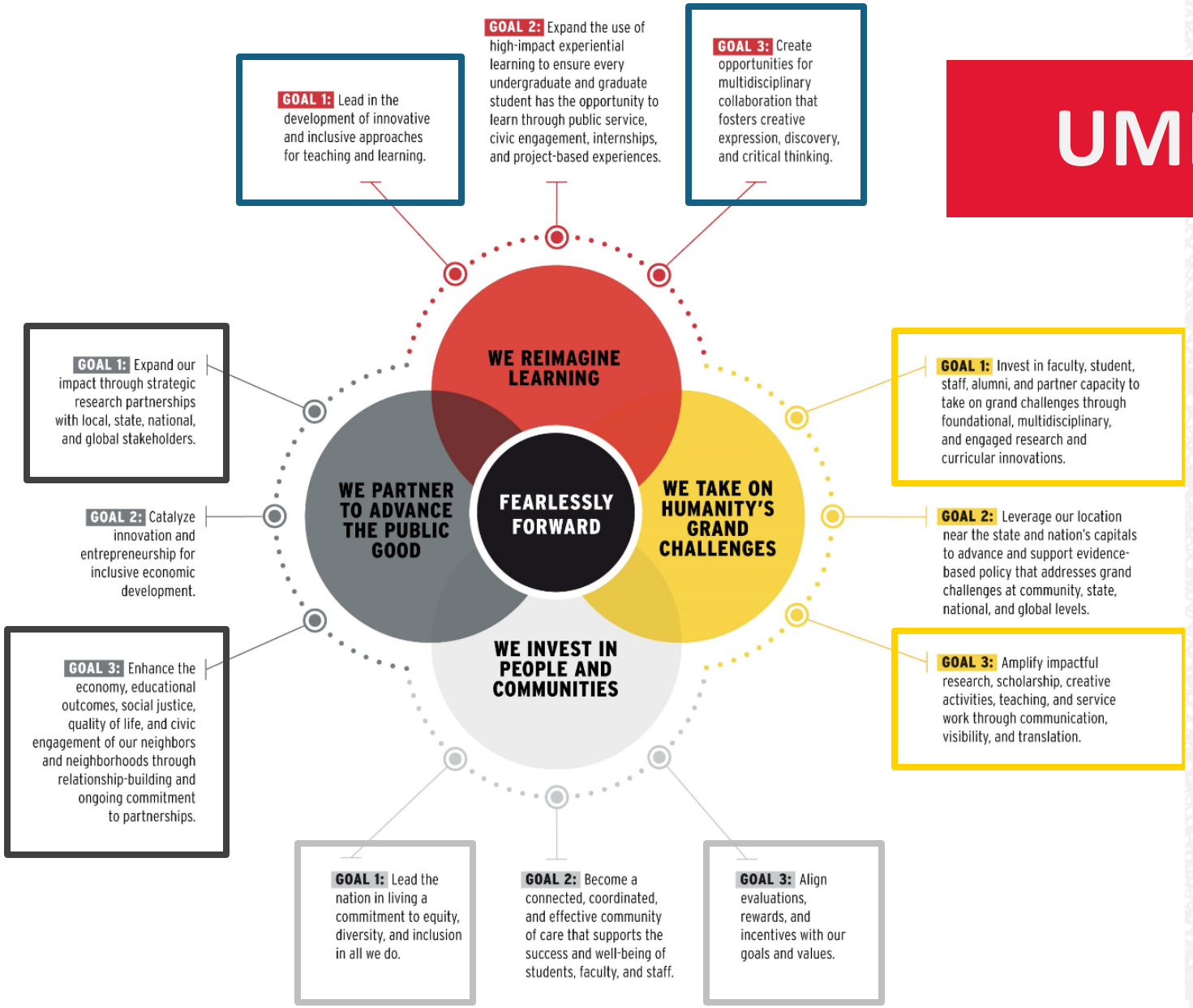
John Sawyer, PhD

2114 Lee Building, College Park, MD 20742

301.314.8132 / jsawyer2@umd.edu



UMD strategic mission



Reimagine Learning

+

Taking on Grand Challenges

+

Invest in People and Community

+

Partner to Advance the Public Good

= X

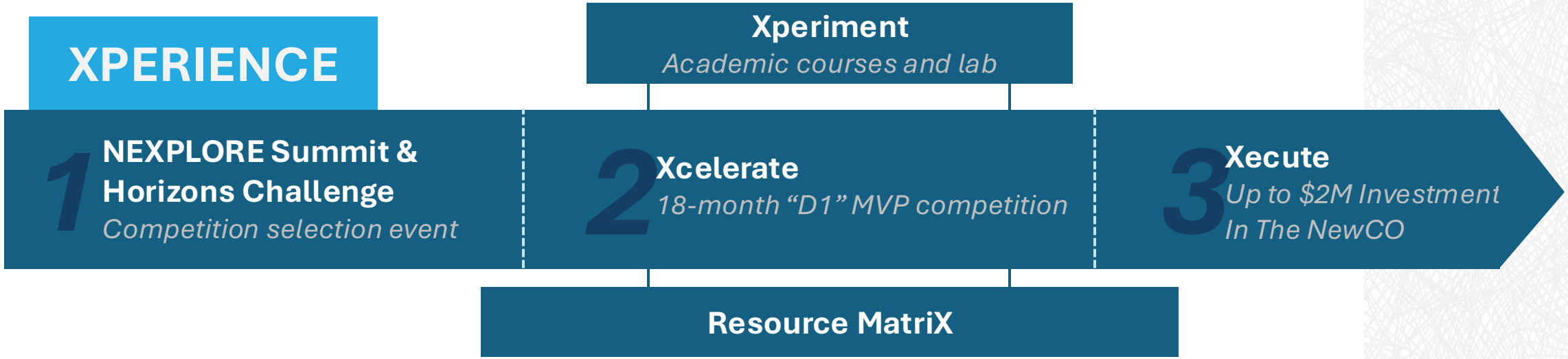
How can we enable universities to become the “Solution Engine” for grand challenges?

Go beyond research and basic education	Build experience while learning	Energize students’ passion, energy, and talent

XFOUNDRY

A selective, multi-university, multidisciplinary program that uses student entrepreneurship as a vehicle for solving grand challenges.

- ☑ Competition multiplier effect
- ☑ Address grand challenges while delivering a valuable experience
- ☑ Unique resource ecosystem supporting launched ventures



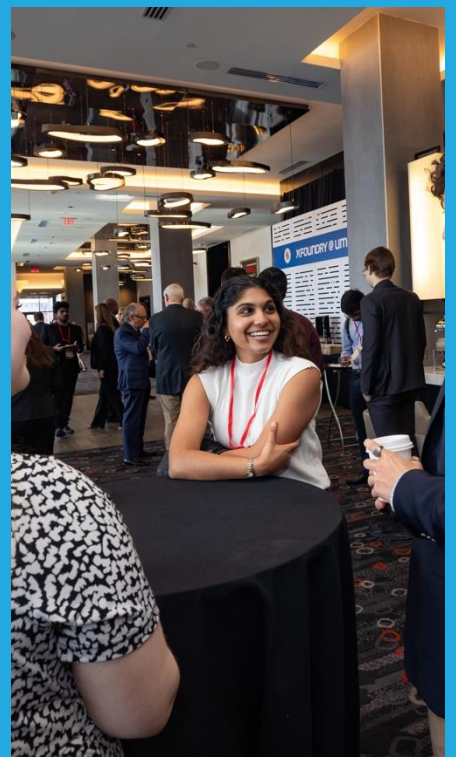
The TEAMS Approach

A unique framework encouraging students to tackle complex, real-world problems as part of founding teams rather than as isolated individuals, an essential shift in today's interconnected world.

- Focus on team formation - individual skills complementing their teammates.
- A cohesive unit equipped to solve multidimensional challenges.
- Open entrepreneurship to a broader range of students.
- Students become "solution-makers," contributing their technical, creative, or analytical strengths.

Technology
Entrepreneurship
Arts & Athletics
Marketing
Science

Enhances students' skills and mindsets and positions universities as key drivers of innovation and solutions to global problems.



xFoundry@UMD

125+ STUDENTS IN XFOUNDRY PROGRAMS

ALL **12** UMD COLLEGES & SCHOOLS ENGAGED

$250K TO **$2M** INVESTED INTO STUDENT TEAMS THAT WIN THE COMPETITION

Active Xperience Competitions

2025 Active school shooter detection and notification (in progress)

2026 Mental health in adults 18-29

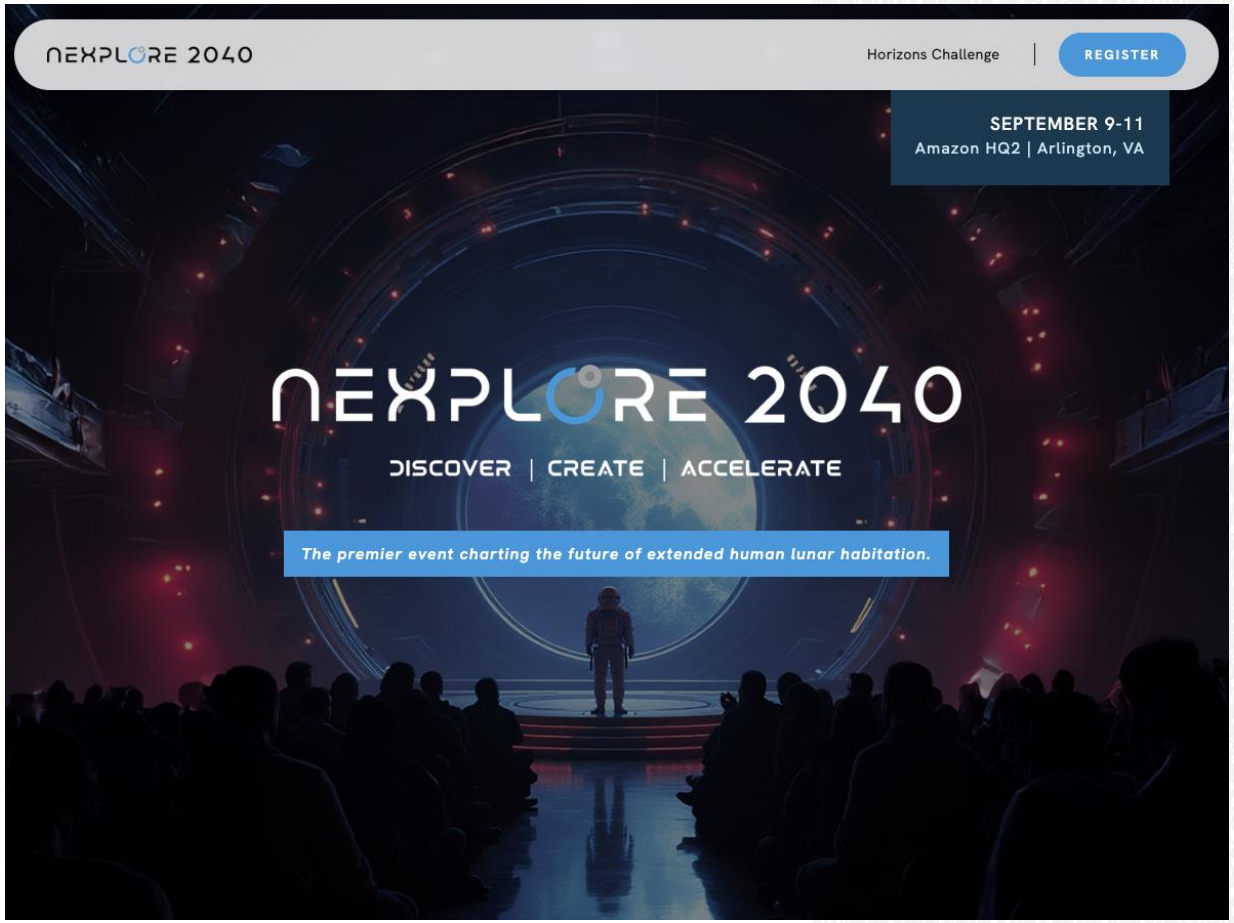
2026 Chronic care management in adults 65+ **(First UMB+UMD Competition)**

NEXPLORE 2040

xfoundry.org/nexplore

[View NASA's NEXPLORE Vision Here]

- Gathering stakeholders to discuss near-term needs and impacts of NASA 2040 development pathways
- Seminars, roundtables, experiences, and showcases
- Launch of Xperience 2040 competition for '26-'27 via Horizon Challenge
- Academic/industrial partnerships created and highlighted



HORIZON CHALLENGE Program Goals

- Provide a mechanism for early university engagement that can be completed in 6 months.
- Have on-ramp for students into 18-month multi-million-dollar xFoundry Xperience competitions.
- Increase democratization of the down-selection mechanism for better stakeholder engagement.
- Incentivize early relationship-building between R1s and community colleges.

Horizons Challenge Process

01 Start with a focus area

02 Ask questions to do something

03 Develop your solution topic

04 Work on your team pitch

05 Pitch live at the NEXPLORE Summit

FOUNDRY @ UMD

2/2024 – 2/2025

Universities:	1
Top Industry Partners:	7
Ventures/Influencers:	1

FOUNDRY @ UNIVERSITY

2/2025 – 4/2025

Universities:	14
Top Industry Partners:	20
Ventures/Influencers:	14

NEXPLORE 2040

DISCOVER | CREATE | ACCELERATE

xfoundry.org/nexplore