



Dr. John Hardin
EXECUTIVE DIRECTOR

June 12, 2026

Welcome to the annual installment of *Research North Carolina*, a forum for North Carolina institutions and companies to showcase their research programs, innovations, and achievements.

The [2025 Nobel Prize in Economics](#) was awarded to three economists who explained innovation-driven economic growth. Their pioneering work shifted the long-standing focus away from static capital accumulation to a dynamic continuous growth process powered by research, technological breakthroughs, and intellectual openness.

One of the economists showed that continuous growth requires "useful knowledge"—understanding not just that an invention works, but *why* it works—coupled with an intellectual environment that is open to new ideas and tolerant of change. The other economists developed rigorous mathematical models for the concept of "creative destruction," showing how an economy advances when superior new innovations enter the market and intentionally displace older, outdated products, technologies, and firms. This ongoing interplay of useful knowledge, creative destruction, and a supportive, receptive intellectual environment are what has enabled humans to yield—on an ongoing basis—more value out of the earth's natural resources.

One of our state's strongest sources of useful knowledge is its research universities. North Carolina's academic research and development (R&D) expenditures relative to the size of its economy consistently rank in the top tier nationally. The ongoing transfer of this knowledge and these technologies from our universities to industry and society is vital for realizing their economic and social potential.

Another catalyst are small businesses, who, according to the U.S. Census Bureau's [Business Dynamics Statistics](#), are responsible for nearly the entirety of net job creation nationwide across the past two decades. The number of net business formations in Knowledge- and Technology-Intensive (KTI) employment industries as a percentage of the total number of business establishments in North Carolina is higher than the U.S. average and has been increasing at a rate faster than the U.S. average rate for more than 20 years.

Together, our universities, businesses, and support organizations are fueling our state's economic growth. This special section, *Research North Carolina*, is a great way to learn in more detail about the types of research and innovation-based activities that are helping to grow our economy and improve our quality of life in North Carolina.

The Office of Science, Technology & Innovation commends *Business North Carolina* on this important initiative to spotlight the state's critically important research activities. I invite you to read *Research North Carolina* in detail and to support and join these efforts.

Sincerely,

John W. Hardin

North Carolina Department of Commerce | Office of Science, Technology & Innovation
301 North Wilmington Street | 1326 Mail Service Center | Raleigh, NC 27699-4300
919 814 4642 T



RESEARCH NORTH CAROLINA

72	NC STATE UNIVERSITY	84	RTI INTERNATIONAL
74	APPALACHIAN STATE UNIVERSITY	86	N.C. BIOTECHNOLOGY CENTER
76	UNC ASHEVILLE	88	SMALL BUSINESS AND TECHNOLOGY DEVELOPMENT CENTER (SBTDC)
78	WESTERN CAROLINA UNIVERSITY	90	FAYETTEVILLE STATE UNIVERSITY
80	UNC CHARLOTTE	92	N.C. A&T COLLEGE OF AGRICULTURE AND ENVIRONMENTAL SCIENCES
82	N.C. MILITARY BUSINESS CENTER		



NC State research continues to be a key resource for growers — and consumers.

AT NC STATE UNIVERSITY, RESEARCH JUST WORKS

For nearly 140 years, North Carolina's premier land-grant university has kept to its mission: preparing the people of our state for what's next.

In the past decade, a staggering \$4.5 billion has flowed to 23,000 different research projects at NC State University, fueling economic activity statewide. Last year alone, industry, government and nonprofits awarded us more than half a billion dollars to pursue research and discovery.

These are nationally significant figures: Among public universities without a medical school, NC State is No. 6 in the United States in total research expenditures, according to the most recent Higher Education Research and Development (HERD) survey data. For licensing agreements with industry? First in the nation.

Across a range of commercialization activity — new products released, startups launched, agreements executed — NC State University consistently ranked among the top 10 public universities without medical schools in FY24, per the Association of University Technology Managers. Among North Carolina universities, it stood alone at No. 1.

That same year, NC State led the entire UNC System in expenditures from key federal agencies: the Department of Agriculture, Department of Defense, Department of Energy, the National Science Foundation (NSF) and NASA. (And it was a three-time NC State graduate, Christina Koch, who became the first woman to travel around the moon as part of the Artemis II mission.)

Public dollars ultimately flow to the private sector — and so to North Carolina communities. NC State leads a regional hub to surge semiconductor production and another to reforge metallurgical engineering. Our university is home to globally renowned research powerhouses like the N.C. Plant Sciences Initiative, nine industry consortia pursuing shared goals, and two NSF Engineering Research Centers tackling the smart energy grid and self-powered wearables. Only one other university in the country has taken part in as many institutes of Manufacturing USA, a national network designed to bolster domestic manufacturing.

Statewide Service, Then and Always

We were built to do all this. As a public land-grant conceived during the 19th century, NC State was designed to create the workforce for a newly industrial America. In the wake of World War II, when public research became the backbone of U.S. technological supremacy, we became North Carolina's foremost R&D department. Yet education and research have always been two prongs of the same mission: prepare the people of our state for the shared prosperity ahead.

Half of North Carolina's engineering workforce learned its trade at NC State. The university confers more engineering doctorates than any other institution in the state — and sits at No. 13 nationwide. Our Golden LEAF Biomanufacturing Training and Education Center has created more than 1,000 skilled biomanufacturing graduates since it opened its doors in 2007. The NC State College of Veterinary Medicine — renowned for its translational research — is ranked fourth in the country. We host the nation's largest Science Olympiad. And our 18 agricultural research stations dotted across North Carolina support extension activities in all 100 counties. In short, we have always strived to ensure that the fruits of our work will ripen across the state and nation.

Consider NC State's steadfast support of the textiles industry — one of the "Big Three" that historically drove the North Carolina economy. As traditional manufacturing declined, NC State played a vital role in the high-tech innovation that has reinvigorated the entire sector. Today, the Wilson College of Textiles at NC State is the only school in North America devoted to the field; our Nonwovens Institute is the largest industry-academic cooperative research center in the nation; and North Carolina boasts the second-largest textiles workforce in the country.

The Partner of Choice for Industry

So far this century, more than 268 startups have launched from NC State's intellectual property. Major companies that began on our campus include the multinational SAS Institute, which generates more than \$3 billion in revenue annually and is still headquartered in Cary, North Carolina. And we don't just help build new businesses; we attract existing ones.



Half of North Carolina's engineering workforce learned their trade at NC State.

Companies as diverse as Under Armour, Novo Nordisk, Hitachi and FUJIFILM Biotechnologies credit NC State for their sustained investments in North Carolina, drawn by our talent pipeline, our leading-edge facilities and our world-class faculty researchers. When JetZero selected North Carolina for a \$4.7 billion airplane manufacturing hub that will create 14,500 jobs, NC State played a key role in showcasing our state's highly skilled, homegrown workforce.

Innovation is a long game, until it isn't. Take NC State's Centennial Campus, first conceived four decades ago. Today, it's one of the premier research developments in North America, home to more than 70 companies, government agencies and nonprofits alongside an equal number of academic units. Like NC State itself, it's a place that fosters collaboration between the academy and industry, between students and their future employers, and between North Carolina's people and the university made to serve them.

In three different centuries, investment in NC State continues to pay dividends for all.

Learn more at research.ncsu.edu/research-works

NC STATE
UNIVERSITY

OFFICE OF RESEARCH AND INNOVATION
919-515-2117
ncstate-research@ncsu.edu



APP STATE: PUTTING INNOVATION TO WORK FOR RURAL NC

Like the headwater streams that feed watersheds throughout the region, Appalachian State University’s public impact research flows outward, fueling progress in every corner of North Carolina. Uniquely positioned within and connected to rural communities across the mountains and foothills, the university is driving solutions-oriented work energized by student engagement and community partnerships.

“At App State, our research doesn’t stay in the lab — it drives innovative developments in our classrooms, across industries and in our communities,” App State Chancellor Heather Norris said. “Together, our faculty and students are addressing immediate regional needs and preparing for the future’s complex challenges, contributing directly to a more resilient and prosperous North Carolina.”

Community-Engaged Research

App State research begins with engagement and listening, drawing together experts from academia, industry, government, nonprofits, healthcare and more. University-hosted events such as the recently convened Idea-to-Impact Collider and the 2025 Western North Carolina Research for Recovery and Resilience Workshop (WNC R3) invite regional stakeholders to help match community needs with research expertise, to identify project gaps and opportunities, and to foster partnerships.

“Whether responding in the aftermath of Hurricane Helene or working with our farmers and healthcare professionals to craft region-specific solutions, App State researchers leverage stakeholder engagement, interdisciplinary collaboration and community partnerships while offering students unique opportunities to participate in research,” said Dr. Christine Ogilvie Hendren, vice chancellor of research and innovation at App State.

Read more about how App State researchers are improving lives across North Carolina by making farms more productive, expanding support for families and healthy aging and safeguarding our communities against future disasters.

Support For Children with Developmental Delays

App State researcher Dr. Gavin Colquitt, executive director of the Appalachian Institute for Health and Wellness, and his team are developing an interactive digital platform that will provide resources to families of children with developmental delays. Enhanced by artificial intelligence, 3 Moves Ahead NC will offer interactive coaching of parents in early motor development and support services ranging from home-based solutions to customized video content, progress tracking, a peer support network and other resources — helping fill a critical area of need. One in six children in the U.S. experiences developmental delays, and parents often lack support and childcare. The project has received \$1.1 million in grant funding from NCInnovation.



Strength Research to Improve Longevity

In other health and wellness advances, research into the connection between grip strength, strength training and longevity at App State’s Beaver College of Health Sciences stands to give the public tools for longer and better living. Dr. Jeffrey McBride and Dr. Andrew Shanely, professors in the Department of Kinesiology, and a team of student researchers are in the midst of a long-range study with a goal of bolstering emerging science around the link between whole body strength and longer life. The science reinforces the importance of strength training as well as aerobic exercise for enduring health.

Streamlined Parasite Analysis in Livestock

Developing resilient food systems and enhancing North Carolina agriculture are key focus areas at App State. Researchers in Boone lab spaces are busy helping to build a next-generation, AI-enhanced robotic microscope that is compact and simple enough to use in the field. North Carolina farmers will be able to employ the novel tool to quickly and efficiently identify parasites in livestock and poultry, bypassing wait times for professional lab work and potentially saving millions of dollars in losses. Led by Dr. Zachary Russell, assistant professor in the Department of Physics and Astronomy, the project was supported in 2025 with a \$2.3 million grant from NCInnovation.

A New Market for NC Cash Crop

Drawing on more than 60 million pounds of surplus sweetpotatoes that would otherwise rot in the fields, Dr. Brett Taubman and Daniel Parker, researchers in App State’s Department of Chemistry and Fermentation Sciences, are developing a plant-based milk product line with plans for dual production facilities in Boone and Eastern North Carolina. Called Rootsii, the project will create and scale production capacity for milk, yogurt, ice cream and other sweetpotato-based products with support from a \$1.82 million NCInnovation grant and the expertise of numerous local and regional partners. At scale, the startup stands to create jobs and an important niche in an expanding plant-based milk market, which is projected to grow from \$22.5 billion globally in 2025 to more than \$40 billion by 2035.

Research to Strengthen Mountain Communities

Strengthening mountain communities against disasters such as Hurricane Helene is a central research goal at App State, and ongoing inquiry is applying lessons from the historic storm to identify solutions for the future. Following Helene, App State convened the WNC R3 workshop with a wide range of stakeholders, laying the foundation for a network to help strengthen community-informed public impact research for a resilient Western North Carolina.

Disaster Resilience in Mountain Communities

- Infrastructure and home construction innovations
- Mental health and community well-being
- Economic revitalization and workforce development
- Environmental stewardship and disaster preparedness
- Educational adaptation and support
- Leveraging arts and culture for recovery
- Community engagement, collaboration and data-driven decision-making

Enhancing Flood Models for Mountain Terrain

Among numerous research-informed efforts to armor the region against the impacts of future storms, a project led by App State assistant professor Dr. William Wang is developing more accurate and refined maps of flooding in mountain terrain by incorporating machine learning, community input and new detail on topography and infrastructure. With an end goal of creating a user-friendly digital platform and tools for community outreach, the project aims to offer a dynamic, high-resolution vulnerability index that residents and responders alike can use to plan ahead.

Emergency Energy Microgrids for Schools

During and after natural disasters, communities congregate at school facilities. Led by Dr. Jamie Russell, director of the Appalachian Energy Center, App State researchers are designing a plan for placing microgrids in schools. Capable of operating independently of the grid, the units could provide critical energy sources when lines go down.



Collaborate with us. Learn more at appstate.edu/research and ori@appstate.edu

APPSTATE

OFFICE OF RESEARCH AND INNOVATION

John E. Thomas Building
287 Rivers Street, Room 382, Boone, NC 28608
828-262-6637



From left to right, Assistant Professor Jeromy Rech and Adam Wold ('25) display a solar cell panel.

BEYOND THE LAB

UNC ASHEVILLE STUDENTS TURN HANDS-ON RESEARCH INTO CAREER-READY OPPORTUNITIES

At the University of North Carolina Asheville, almost 3,000 students across more than 60 academic programs take their learning outside of the classroom. As one of a select group of institutions designated as a Research College and University by the Carnegie Classification of Institutions of Higher Education, UNC Asheville invests on average over \$2.5 million annually in research and development while providing undergraduates with a dynamic, leadership-focused, and relationship-driven education.

McCullough Fellow Helped Develop Greener Materials for the Future of Solar Power

Chemistry & Biochemistry major Adam Wold ('25) helped shape a more sustainable future through undergraduate research at UNC Asheville.

Working with faculty mentor Jeromy Rech, assistant professor of chemistry, and community partner Sugar Hollow Solar, Wold developed environmentally friendly materials for organic solar cells. The project focuses on creating green-solvent solar materials that could reduce the environmental impact of solar panel manufacturing while expanding the use of flexible, portable solar technology.

The research earned Wold the Grand Prize for his presentation at the Appalachian Energy Summit and was supported through UNC Asheville's McCullough Fellowship, which funds applied research projects connecting students, faculty, and community partners.

Wold joined Rech's lab in 2023 after learning about the University's strong culture of undergraduate research, where more than 65 percent of students participate in hands-on projects. Through the fellowship, he gained experience collaborating with industry professionals, conducting independent research, and addressing real-world sustainability challenges.

"Ultimately, research is taking what you learn in the classroom and applying it to a real-world problem," says Rech. "If students want to go to graduate school, if they want to go to medical school, if they want to get a job, these types of experiences are really what train them for that."

Faculty Research Advances Fight Against Drug-Resistant Infections

UNC Asheville Chemistry faculty members Amanda Wolfe and Ryan Steed are advancing research that could help address one of the world's most urgent health challenges: antibiotic-resistant bacterial infections.

Supported by the first NCInnovation Award awarded to UNC Asheville, the researchers are developing a new class of antibiotics designed to target pathogenic bacteria while leaving human cells unharmed. This award will help the team secure patents on their



From left to right, Professor Amanda Wolfe gives UNC System President Peter Hans a tour of the Steed Wolfe Lab.

discoveries and bring the research closer to preclinical studies and potential commercialization.

The collaboration began when Wolfe, an expert in antibiotic development, and Steed, who studies how bacteria produce energy, identified a promising connection between their fields. Together, they discovered compounds that can block an enzyme bacteria need to survive and created a potential pathway for new treatments against drug-resistant infections.

Their work has been supported through nearly half a million dollars in federal and private grants and has engaged more than 50 UNC Asheville undergraduates through coursework and independent research. Students have contributed to the discovery process, earned authorship on scientific publications, and presented findings at professional conferences.

"Our students are the ones who are really driving the research forward," said Wolfe.

"It allows them to not only do the research but kind of learn how research works in a real lab setting."

By combining innovative research with hands-on student learning, Wolfe and Steed are preparing the next generation of scientists to create solutions for a growing global health challenge.

Biology Students use Cutting-Edge Technology to Tackle Global Challenges

At UNC Asheville, biology students are using a one-of-a-kind instrument to study everything from soil biodiversity to infectious disease.



From left to right, Professor Camila Filgueiras, Michael O'Cain ('24), and student Josh Fogel discuss the life cycle of tiny soil-dwelling roundworms.

Developed by SoilTech, a startup company based on UNC Asheville's campus, the Smart Soil Organism Detector (Smart SOD) uses advanced imaging, artificial intelligence, and laser technology to identify and sort microscopic organisms from soil samples. The tool is creating new opportunities for students to conduct research with real-world applications while working directly alongside industry professionals.

Anaya Harry ('26), along with alum Michael O'Cain ('24) are among the researchers using the technology. O'Cain studies soil biodiversity and helps process samples for projects ranging from regional ecological studies to large-scale biodiversity initiatives. Harry is using the Smart SOD to support research on bacteria responsible for staph infections, work that could contribute to future medical treatments.

"I'm learning that there are so many different facets of science that overlap," said Harry. "I'm grateful that I had the opportunity to work in a lab, and it's taught me so many skills and about what to expect when it comes to doing research."

The partnership between SoilTech and UNC Asheville gives students experience in biology, technology, and data science, and environmental science.

These opportunities provide UNC Asheville students with a direct pathway to graduate study and careers in biotechnology, environmental science, healthcare, and research. Their access to funding, expert faculty and industry connections turn their classroom learning into discoveries that address challenges facing communities around the world.

A culture of mentorship turn ambitious students into career-ready professionals. Learn more at go.unca.edu



UNC ASHEVILLE
1 University Heights
Asheville, NC 28804
828-251-6600



Martin Tanaka works with engineering students on a capstone project.

RESEARCH TO REVENUE: HOW WCU POWERS NORTH CAROLINA'S ECONOMY

Western Carolina University is strengthening its role as a driver of research, innovation, and economic development across North Carolina by translating academic expertise into market-ready solutions that create jobs, attract investment, and improve lives.

A recent example is the work of Martin Tanaka, a professor of engineering and technology, whose applied research demonstrates how public universities can move ideas from the classroom and laboratory to commercialization. With support from NCInnovation, Tanaka is developing a new medical device to treat lymphedema, a chronic condition that causes painful fluid buildup in the arms or legs and often affects breast cancer survivors.

Tanaka has already secured two patents for medical devices—one related to rotator cuff surgery and another for nasal surgical procedures. Now, backed by a \$1 million award from NCInnovation, he is advancing a third innovation with the potential for wide-reaching health and economic impact.

The funding is part of a \$10 million NCInnovation initiative supporting 13 applied research projects across 11 University of North Carolina System campuses. The goal is to accelerate commercialization of university research and strengthen North Carolina's innovation economy.

"This project would not be happening without this funding," Tanaka said. "The idea would have just sat in a file in my drawer, probably until I retired."

Tanaka's lymphedema device builds on more than a decade of research, including a compression garment donning device he and a team of WCU engineering students developed in 2011. The current project moves far beyond concept, focusing on product design, performance optimization and preparation for clinical testing.

The project will employ two full-time researchers and four students, including participants from WCU and Southwestern Community College, highlighting how research investment also supports workforce development and regional collaboration. Clinicians and patients will be directly involved in refining the device to ensure it is practical, effective and positioned for adoption.

While the technology aims to reduce physical pain, Tanaka said it also addresses the emotional burden of lymphedema, which can cause patients to withdraw socially due to visible disfigurement.

"This is about restoring quality of life and dignity," Tanaka said.

Tanaka credits WCU's leadership with fostering an environment that supports applied research and product development. He noted the support of Chancellor Kelli R. Brown, College of Engineering and Technology Dean Randy Collins and NCInnovation partners in helping move the project forward.

"The university is helping create an ecosystem that supports research, design and development," Tanaka said. "It's providing everything this project requires."



Tanaka provides hands-on learning experiences for his students.

Before entering higher education, Tanaka spent 11 years working in industry on commercial products. That background informs his approach to academic research, emphasizing real-world applicability and market relevance.

His work reflects a broader shift at WCU toward applied research that aligns with regional economic needs and statewide innovation priorities.

Research activity is only one component of WCU's significant economic footprint.

Each year, WCU generates a total economic impact of \$894 million for the 16-county region of Western North Carolina and \$1.5 billion statewide. The university supports more than 7,358 jobs in WNC and 10,627 jobs across the state, both directly and indirectly.

For every \$1 invested in university operations, North Carolina gains \$5.61 in output.

The university employs more than 2,000 people and spends approximately \$323 million annually on operations and capital projects. It also attracts an estimated 204,000 visitors each year, contributing to tourism and local business activity throughout the region.

Equally important is WCU's role in talent development and retention. More than 63,000 alumni live and work in North Carolina, with 40 percent residing in the WNC region. Their increased earnings strengthen local economies and help communities attract and retain employers.

WCU's economic influence spans a 16-county region including Buncombe, Haywood, Henderson, Jackson, Macon and surrounding counties, where access to higher education, research activity and skilled graduates plays an outsized role in economic resilience.

The university's impact was analyzed in partnership with Creative Economic Development Consulting using IMPLAN, a nationally recognized economic modeling tool. The analysis examined five drivers: university operations, capital investment, student spending, visitor spending and increased alumni earnings, using data from university records, regional tourism reports and U.S. Census-based wage data.

While NCInnovation's mission prioritizes North Carolina, the solutions emerging from WCU extend beyond state borders.

"This is a problem around the world," Tanaka said of lymphedema. "The solutions we're developing will benefit North Carolinians—and people everywhere."

For business leaders and policymakers, WCU offers a clear return on investment: applied research connected to regional strengths, supported by public-private partnerships, and designed to translate into new products, companies and jobs. As the university continues to expand its research capacity, projects like Tanaka's highlight how strategic investment in public higher education fuels innovation, economic growth and long-term prosperity across North Carolina.



Western Carolina University's campus is surrounded by one of the state's most biodiverse regions, offering students unparalleled learning and research opportunities.

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1 University Drive,
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1-877-WCU-4YOU



Stephanie Schuckers, Bank of America Distinguished Professor in Computing and Informatics, leads the Center for Identification Technology Research (CITeR), which focuses on biometric security and deepfake detection.

UNC CHARLOTTE'S EXPANDING ROLE IN DEFENSE INNOVATION

Defense modernization, advanced manufacturing and critical technology investment are creating new opportunities for regions that can connect research, industry and workforce quickly.

Charlotte is positioned to compete in that environment.

As North Carolina's urban R1 university, UNC Charlotte is making intentional investments to help connect regional strengths in ways that accelerate innovation, strengthen economic competitiveness and expand opportunities across the region.

That strategy took shape this year through three connected moves.

The university launched the National Defense and Intelligence Innovation Institute (NDI3), joined North Carolina's First in Defense coalition and signed a memorandum of understanding with RTI International to explore collaboration opportunities connected to a proposed Defense Innovation Unit (DIU) OnRamp Hub, where UNC Charlotte will serve as RTI's primary academic partner connecting Charlotte and Western North Carolina.

Together, those efforts reflect a broader vision: position Charlotte as a region where mission-driven research, technology transition and workforce development come together to accelerate real-world impact.



Through internationally recognized expertise in measurement science, the Center for Precision Metrology helps solve complex precision and quality challenges for advanced manufacturing and defense partners.

"Charlotte already has many of the ingredients that matter in defense innovation: advanced manufacturing capabilities in defense and motorsports, energy expertise, logistics connectivity, commercialization capacity and a concentration of advanced industry that gives the region unusual depth," said John Daniels, vice chancellor for research. "UNC Charlotte's role is to connect those regional strengths with research, talent and partners in ways that accelerate the transition of ideas into real-world impact."

At the center of that effort is NDI3.

Launched in January 2026, NDI3 serves as UNC Charlotte's central institute for defense-related research, partnerships, technology transition and workforce development, bringing together faculty expertise with government and industry collaboration to accelerate use-inspired research and move dual-use technologies toward operational impact.

Building on capabilities that already exist across the university, NDI3 focus areas include advanced manufacturing, cybersecurity, AI-enabled systems, unmanned systems, operational energy, optics and photonics and human performance, capabilities increasingly aligned with federal priorities.

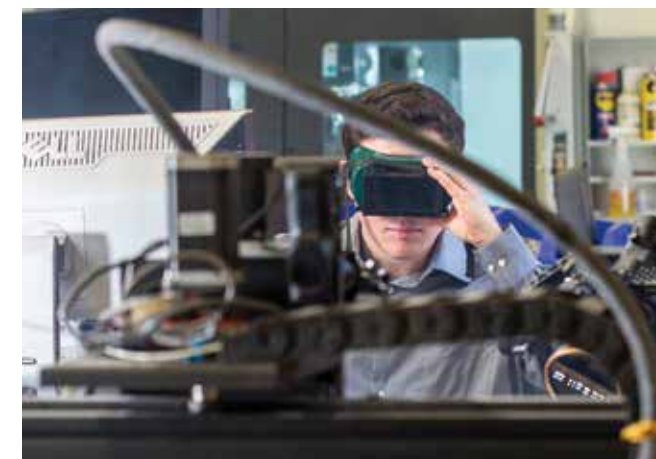
Using advanced manufacturing as an example, UNC Charlotte is home to the Center for Precision Metrology (CPM), an internationally recognized research center advancing precision measurement and advanced manufacturing systems. Through work in manufacturing inspection, precision engineering and advanced measurement, researchers support technologies that make next-generation production environments more precise, efficient and reliable.

That capability extends into optical science and engineering, where UNC Charlotte researchers advance sensing, optoelectronics and measurement technologies that support advanced manufacturing and emerging technology environments.

UNC Charlotte is also building momentum in AI and cybersecurity.

Among the research areas in the institute is the Center for Identification Technology Research (CITeR), which is advancing biometric security through work focused on defending against increasingly sophisticated AI-enabled attacks including deepfakes, identity spoofing and digital manipulation. Researchers work alongside government and industry partners to strengthen identity assurance and develop technologies designed to stay ahead of emerging threats. CITeR maintains one of the world's largest biometric spoof databases and provides students with hands-on experience in advanced identity security.

Across campus, research centers including the Energy Production and Infrastructure Center (EPIC), the Center for Energy Security and Reliability (CESAR), the Charlotte AI Institute (CLTAI²), AI4Health and CIPHER contribute expertise to NDI3 spanning energy resilience, artificial intelligence, health and decision support.



UNC Charlotte's motorsports engineering program develops expertise in high-performance systems with applications in defense-related technologies.

NDI3 was created to connect research strengths beyond campus by advancing relationships among academia, industry and government to accelerate pathways from discovery to application. That approach is reflected in UNC Charlotte's participation in the First in Defense coalition.

Led by the North Carolina Critical Technologies Alliance and the NC Chamber, the coalition brings together broad organizations to bolster the state's position in defense innovation and critical technology development.

UNC Charlotte's participation, alongside exploration of collaboration opportunities through the proposed DIU OnRamp Hub with RTI International, expands opportunities to align regional strengths with emerging defense and commercialization priorities.

The Charlotte region brings distinct advantages to that work: proximity among research capability, industry expertise, infrastructure and commercialization pathways. That combination creates an environment where technologies can be developed, tested and moved toward real-world application more quickly.

As federal investment in defense modernization accelerates, regions that can connect innovation to execution will be positioned to lead.

The university is working to ensure Charlotte is one of them.

Learn more at research.charlotte.edu/ndi3



UNC CHARLOTTE
9201 University City Blvd.
Charlotte, NC 28223
704-687-8622
charlotte.edu



The 2026 Summit Organizational Award was presented by NCMBC Executive Director Scott Dorney to the Society of American Military Engineers (SAME) Carolinas Region at the Southeast Regional Federal Construction, Infrastructure & Environmental Summit. This award recognizes the organization's outstanding contributions and leadership in support of the defense infrastructure ecosystem. Pictured left to right: Brigadier General Ralph J. Rizzo, Rear Admiral Jeffrey J. Kilian, Marty Ray, Lieutenant General Stephen G. Smith, Scott Dorney.

STATEWIDE APPROACH TO FEDERAL OPPORTUNITY IN NORTH CAROLINA

By Jaycie Beam, North Carolina Military Business Center

The North Carolina Military Business Center (NCMBC) is a statewide business development and technology transition entity of the State of North Carolina, embedded in the North Carolina Community College System and headquartered at Fayetteville Technical Community College. NCMBC serves businesses across the state through a network of 19 offices.

The mission of the NCMBC is to leverage military and other federal business opportunities to expand the economy, create jobs, and improve the quality of life in North Carolina. Central to this mission is increasing federal revenues for businesses in North Carolina by strengthening their ability to compete in the federal marketplace.

The NCMBC employs a statewide, collaborative approach anchored by a team of experienced business development professionals located across the state to connect firms with current government opportunities. The organization's Regional Program Directors collectively bring more than 300 years of contracting experience, with expertise across industry,

procurement, and federal acquisition. The team works directly with businesses to identify relevant federal opportunities, government solicitations, review competitive proposals, and provide guidance throughout the contract process.

In addition to business development support, the NCMBC hosts several major events each year designed to expand access to information, provide networking opportunities, and access to federal and defense decision-makers. These high-impact events bring together small businesses, federal agencies, prime contractors and industry leaders across the state creating opportunities for engagement, collaboration, and participation in the federal marketplace.

Why attend? NCMBC provides businesses with a variety of programs, opportunities for networking, and direct access to key stakeholders in the federal workplace. If you are a business exploring government contracting for the first time or an established business seeking to expand, NCMBC offers the tools, expertise, and connections to help you succeed.



Stantec participated as a gold sponsor for the Southeast Region Federal Construction, Infrastructure and Environmental Summit. Pictured is a networking engagement between representatives from Stantec and Sundance Consultants, LLC, highlighting opportunities for partnership and business development.



Participants engage in active discussion during the US Army Program and Procurement Dialogue. Speaker participation included Fort Bragg Garrison Command, Fort Bragg Directorate of Public Works, Fort Bragg Mission and Installation Contracting Command (MICC), the 596th Transportation Brigade (MOTSU), and the United States Army Reserve Command. These sessions provided valuable insights into current programs, procurement priorities, and collaboration opportunities.

UPCOMING EVENTS:

Medical, Biomedical, and Biodefense (MBB): Support to the Warfighter Symposium, September 23-24, 2026 in Chapel Hill, NC. MBB connects businesses in North Carolina with military and other federal agencies that require or purchases medical supplies, equipment, devices, staffing, pharmaceuticals, and medical services. Representatives from the DoD, Department of Veteran's Affairs, and Health and Human Services, highlights current technologies or resource gaps and needs, to supply military and federal medical facilities and agencies. For more information, visit: <https://mbb.ncmbc.us/>

Southeast Region Federal Construction, Infrastructure and Environmental Summit (Summit), April 22-24, 2027 in Wilmington, NC. The Summit brings together over 800 representatives from the Corps of Engineers, Naval Facilities Engineering Systems Command, Fort Liberty, Marine Corps Installations East, Seymour Johnson Air Force Base, US Coast Guard, Department of Veteran Affairs, General Services Administration, and other federal agencies, general contractors, and suppliers throughout the southeast. The Summit provides an opportunity for businesses to meet with these agencies and to market their services and products. For more information, visit: <https://summit.ncmbc.us/>

Federal Textile and Defense (FEDTEX), Spring 2027. FEDTEX connects the DoD and federal agency clothing and individual buyers with US textile manufacturers, textile supply chain suppliers, research and development facilities, and academic resources. This event encourages networking with new and existing businesses in the clothing and textile marketplace, and aims to establish a direct dialogue between government, businesses, and academia around critical warfighter issues in the defense textile marketplace. For more information, visit: <https://fedtex.ncmbc.us/>

Federal Technology Symposium (FTS), Fall 2027 FTS highlights the advanced technology needs of major military commands in North Carolina, the Department of Defense (DoD), and the Department of Homeland Security (DHS). FTS aims to create dialogue between industries, academia, and government to address the technology needs of the warfighters and security agencies. For more information, visit: <https://defense.ncmbc.us/>

Defense Industrial Sustainment for Combat Systems Summit (DISC), Fall 2027. This event focuses on strengthening the defense industrial base by connecting prime contractors, suppliers, and service providers in the defense aerospace, ground vehicle, maritime, and armaments markets. Businesses will learn about contracting opportunities with the DoD, original equipment manufacturers (OEM's), and prime contractors. For more information, visit: <https://industrial.ncmbc.us/>

Additional information about NCMBC and upcoming events can be found at ncmbc.us.



Scott Dorney, Executive Director
scott@ncmbc.us

Courtney Smedick, Director of Operations
courtney@ncmbc.us

Jaycie Beam, Communications and Program Support
beamj@ncmbc.us



Artistic rendering of RTI's Pilot Xcelerator.

BUILT TO SCALE IN NORTH CAROLINA

Inside the push to turn breakthrough research into real-world industry

"RTI's Pilot Xcelerator serves as a hub for developing and scaling breakthrough technologies. Located here in North Carolina, we attract partners from across the U.S. and around the world. RTI's investment reflects our long-term commitment to advancing scientific discoveries to real-world impact and drives economic development, supports job creation and propels new startups to commercial implementation."

Tim J. Gabel, RTI President and CEO

North Carolina has spent decades building one of the nation's strongest research ecosystems, powered by universities, startups and global firms that are turning discoveries into new energy solutions, advanced materials and more efficient industrial technologies.

But the hardest part of innovation comes after the breakthrough.

Moving promising technologies out of the lab and into the world where they can be used is challenging; development stalls; investors hesitate. This is often where things break down, and it's the gap RTI International is working to close with its expanded industrial prototyping facility, the RTI Pilot Xcelerator on its campus in Research Triangle Park.

WHERE IDEAS MEET REALITY

Established in 2012, RTI's Pilot Xcelerator is built for a specific moment in the innovation cycle: the point where a technology works in principle, but proof at scale is essential.

It's not an incubator or an ideation space. Companies arrive with systems that already function at the laboratory scale.

What they need is evidence that those systems can operate consistently, safely and economically at an engineering scale.

Across energy, chemicals, advanced materials and industrial processes, this is a familiar challenge. Lab results may look promising, but investors, customers and regulators want hard data before they commit.

"For new energy and industrial technologies to succeed in the market, they must be proven under real-world conditions. Scale-up and validation are essential."

David Dausch, Vice President,
Engineering & Advanced Technology at RTI

TURNING DATA INTO DECISIONS

RTI's Pilot Xcelerator program provides that proving ground. Systems are designed, built and run in environments that reflect the complexity of commercial operations. Engineers construct integrated pilot prototype systems to collect performance data and work with partners to iterate and optimize the design as it moves toward deployment.

At this stage, the challenge is not only technical; it's also financial and strategic.

Investors, customers and regulators want more than a working concept. They want credible data, operational insight and a clear view of costs and risk. Without that evidence, promising projects struggle to attract capital or move beyond demonstration scale.

This is where RTI's Pilot Xcelerator bridges the gap from laboratory discovery to commercial reality.

PROVIDING PRACTICAL ANSWERS

A walk-through makes one thing clear: it's an active engineering environment.

Teams are testing technologies that span sustainable aviation fuels, materials recycling innovations, carbon capture systems and more. In one project, RTI engineers are preparing to design and operate a modular bioreactor that uses microbial processes to convert gases like methane into valuable chemical products. This work reflects both the complexity and ambition behind the systems being tested.

"Our focus is on helping partners answer very practical questions: Does it run the way you expect? Can it scale safely and reliably? What do the data show?"

Sameer Parvathikar, Program Director, RTI Pilot Xcelerator

BUILDING FOR WHAT COMES NEXT

Demand for this kind of infrastructure is rising, as demonstrated by the growing roster of commercial companies leveraging RTI's Pilot Xcelerator to advance their product maturity, from startups to large corporations and RTI is expanding to meet their needs.

Once the facility expansion is completed in late summer of 2026, it will include more than 25,000 square feet of dedicated process bay space, more than doubling its capacity. The expansion adds more covered work bays, control rooms and indoor workspace designed to accommodate a wider range of technologies and project needs.

The investment reflects a broader shift in how innovation moves forward. Companies are under pressure to shorten development timelines while reducing risk. RTI helps clients reduce that risk by increasing the speed of development and testing, reducing development cost via plug-and-play infrastructure and providing real-world testing, coupled with



RTI transforms early-stage energy research into scalable, market-ready technologies.

in-house engineering expertise. Clients also benefit from RTI's partner ecosystem, which can help with the development of commercial strategies, providing paths to market, investor connections and an understanding of policy and regulatory requirements. Together, this helps companies advance through critical testing phases and move toward successful product launches.

FROM BREAKTHROUGHS TO BUSINESS

The impact extends well beyond individual companies.

Access to scale-up and validation infrastructure often shapes where technologies are developed. When those capabilities are available locally, they attract investment, cultivate talent and enable sustained, long-term growth within the region.

By providing this advanced infrastructure in North Carolina, RTI's Pilot Xcelerator allows companies to keep critical development stages in-state, strengthening the region's position not just as a research hub, but as a place where innovation turns into industry.

North Carolina's strength in research is well established. The question now is how effectively those discoveries translate into companies, industries and long-term economic value.

RTI offers a clear answer by creating the conditions where promising technologies can prove themselves—technically, operationally and commercially—before taking the next step.

For companies ready to move beyond prototypes, that proof often makes the difference between an idea that stalls and one that scales.

RTI International is an independent scientific research institute dedicated to improving the human condition.



RTI INTERNATIONAL
3040 East Cornwallis Road
Durham, NC 27713
919-541-6000
rti.org



Credit: iStock.

ACCELERATING LIFE SCIENCES COMMERCIALIZATION

By Mary Hecht-Kissell, North Carolina Biotechnology Center

Since 1984, the North Carolina Biotechnology Center has played a pivotal role in transforming North Carolina into a leading global life sciences hub. As a state-funded nonprofit, NCBiotech champions programs that help move ideas from research laboratories to the marketplace.

North Carolina is becoming well known for its research and development (R&D) prowess. The state has 490 R&D companies employing 13,300 workers statewide.

North Carolina universities serve as engines for innovation, developing new technologies, from cancer therapies to advanced drug delivery systems. NCBiotech provides grants to academic researchers to support translational research. These grants help researchers begin evaluating commercial applications for technologies, laying the foundation for new patents, licensing agreements, and spinout companies.

Early-stage life sciences companies often face difficulty securing initial funding. NCBiotech provides loans ranging from \$150,000 to \$650,000 to early-stage startups. These loans allow companies to advance product development and

hit critical technical and business milestones. In many cases, NCBiotech funding serves as a catalyst that unlocks additional financing from other sources. Portfolio companies have raised \$8B+ in follow-on capital. That's \$124 for every \$1 invested by NCBiotech.¹

COACHING AND MENTORING

Developing a commercially viable product is challenging and often necessitates guidance from trusted experts. NCBiotech's Emerging Company Development (ECD) team serves as a connector for its loan portfolio companies by facilitating meaningful engagement with industry experts.

Through its Entrepreneurs in Residence (EIR) Program, ECD connects startups with successful life sciences executives who can provide coaching, strategy support, and at times, access to helpful resources. EIRs help companies establish business models and operational plans, and provide fundraising guidance, including how to successfully engage and attract opportunities with investors and partners.

ECD also advises companies, delivering feedback on business plans, investor presentations, and supporting technical and scientific materials. The team maintains strong ties with university tech transfer offices and regional incubators and accelerators.

ECD also fosters deep relationships with venture capital investors and angel investor networks, as well as tech scouts from global pharmaceutical companies, enabling matchmaking between these groups and promising startups.

ADDITIONAL RESOURCES

NCBiotech's Life Sciences Intelligence (LSI) team provides services that help startups make informed commercialization decisions. This team delivers market data, industry analysis, and scientific insights. LSI also offers fee-based custom research services.

NCBiotech's LSI team maintains a state-wide Company Directory that includes 860 life sciences companies and additional support companies. Startups can use the directory to identify product- and service-providers in the state, such as contract research organizations, IP attorneys and legal counsel, regulatory affairs specialists, and manufacturing and design firms.

COLLABORATIVE ECOSYSTEM

Many startups leverage partnerships with research institutions, clinical research organizations, manufacturing partners, or large pharmaceutical companies to advance products successfully.

North Carolina has five R-1 research universities, offering abundant opportunities for co-development and access to specialized equipment and scientific advisors.

As the birthplace of clinical research, North Carolina has 170+ clinical service organizations providing a range of services, including assay development, preclinical and clinical research, and clinical trial management. North Carolina has three designated comprehensive cancer centers, ideal locations for conducting clinical trials.

North Carolina has a variety of well-equipped lab spaces statewide. From incubators to accelerators to research parks, startups have plenty of cost-effective options.

With a high quality of life, North Carolina continues to attract strong C-level talent, which is paramount to building resilient, high-performing startups. North Carolina's highly skilled life sciences workforce, which is 76,000 employees strong and growing, ensures startups can find the talent they need at all levels. NCBiotech champions several workforce development programs and job resources to keep the talent pipeline full.

The Conference Center at NCBiotech hosts 480 events annually, bringing together academia, government, entrepreneurs, investors and industry leaders for networking and educational programs.

PROOF OF A SUCCESSFUL INNOVATION ECOSYSTEM:

Here are recent examples of North Carolina's momentum in advancing innovations and attracting outside investment:

- In 2025, venture funding for North Carolina life sciences hit a record \$1.6 billion, beating the state's previous high of \$1 billion in 2021.
- In February 2026, Slate Medicines announced a \$130 million Series A financing led by RA Capital Management, Forbion, and Foresite Capital, to advance its novel therapy for migraine and headache disorders. The company intends to start Phase 1 clinical trials in mid-2026.
- In May 2026, Bayer AG announced plans to acquire Perfuse Therapeutics, whose R&D facility is based in Research Triangle Park, for its investigational treatments for ocular diseases. Bayer will pay \$300 million up front, with additional payments possible if the treatment meets certain development, regulatory and commercial goals, bringing the deal's potential value up to \$2.45 billion.

NCBiotech's long-standing commitment to accelerating commercialization has contributed significantly to North Carolina's reputation as a premier destination for life sciences innovation. Startups navigating the complex path from scientific breakthrough to commercial success will find all the resources they need to grow and scale in North Carolina.

¹ Source: NCBiotech Business Intelligence and Analytics (July 2025)

To learn more, visit ncbiotech.org

**North Carolina
Biotechnology Center®**

North Carolina Biotechnology Center
15 T.W. Alexander Drive
Durham, NC 27713
919-541-9366
ncbiotech.org



Roberts and inSoma Bio have received support from Duke as they spun out, including access to discounted lab space.
photo by Stefan Roberts/Fedor Kossakovski/Duke OTC

THREE SBTDC TECHNOLOGY CLIENTS- ARCLET, INSOMA BIO, AND NUREAM ARE MAKING REAL-WORLD IMPACT

From the mountains of western North Carolina to the state's coastal communities, entrepreneurs are transforming innovative ideas into technologies that improve health, advance science, and enhance quality of life. For many innovation-driven startups, turning a promising idea into a viable business requires more than a strong product. It requires customer discovery, market validation, commercialization strategy, funding preparation, and trusted guidance. The North Carolina Small Business and Technology Development Center's Technology Commercialization team helps entrepreneurs navigate that path, supporting companies as they move from concept to commercialization. Three SBTDC technology clients, Arclet, inSoma Bio, and Nuream, illustrate how North Carolina entrepreneurs are transforming specialized expertise and research breakthroughs into real-world impact.

In Western North Carolina, public health professional Adrienne Ammerman recognized a challenge that became increasingly visible during public health emergencies: organizations often struggle to quickly deliver accurate, trustworthy information to diverse audiences. To address that need, she founded Arclet, a company focused on helping public health communicators access, customize, and distribute reliable health information more effectively. Arclet's platform provides a curated content library and workflow tools that help organizations communicate critical health information with greater speed and confidence.

"Arclet is a real North Carolina story — an impact-driven company built in western NC that grew out of a regional collaborative and now serves users across 26 states. I couldn't have built this without the entrepreneurial ecosystem here, including NC IDEA, Elevate Asheville, and SBTDC."

Adrienne Ammerman, Founder & CEO, Arclet

Building on that foundation, Arclet developed Arli, an NSF-funded artificial intelligence communications co-pilot designed specifically for public health professionals. Unlike general-purpose AI tools, Arli was built to support the accuracy, trust, and evidence-based standards that public health communication requires. As Arclet moved from concept to commercialization, the company worked with the SBTDC Technology Commercialization team on customer discovery, commercialization strategy, and innovation funding opportunities. The company also participated in the National Science Foundation's I-Corps customer discovery program and leveraged the SBTDC's graduate student internship program support to strengthen customer acquisition and business development efforts. Today, Arclet serves organizations in 26 states, demonstrating how a challenge identified in a local community can evolve into a solution with national reach.

Moving to the center of the state, Stefan Roberts, Co-Founder and CEO of inSoma Bio, saw an opportunity to translate discoveries from his doctoral research into technology that could address important challenges in regenerative medicine. Turning academic research into a commercial product, however, requires more than scientific excellence. It demands market validation, product development planning, fundraising, and business strategy. The result of that effort is Fractomer™, a nature-inspired injectable protein scaffold designed to help the body regenerate its own tissue. This technology has potential applications in procedures such as breast reconstruction, facial reconstruction, and other soft tissue restoration treatments.

By mimicking characteristics of natural human tissue, Fractomer™ aims to improve outcomes while reducing reliance on traditional synthetic implants. The technology also has the potential to improve fat graft retention rates, a key challenge in reconstructive procedures. As inSoma Bio advanced its commercialization efforts, it received guidance from the SBTDC and gained national recognition through highly competitive programs including Y Combinator and MedTech Innovator. Today, inSoma Bio has secured more than \$15 million in federal and state grants from SBIRs and organizations like the North Carolina Biotechnology Center to support product development and continued growth.

"I would suggest new businesses to interface with organizations like SBTDC as early as possible because you don't know what you don't know, and it's good to have people that have been there and can foresee some milestones and roadblocks that you can't see yet."

Stefan Roberts, Co-Founder & CEO, inSoma Bio

Continuing east to North Carolina's coast, Nuream, out of Wilmington, represents another example of how entrepreneurs across the state are transforming complex scientific concepts into market-driven solutions. Founded by Rob Cooley, Nathan Munton, and Lauren Munton, Nuream is developing technology designed to gather meaningful health and sleep data through everyday fabrics. The goal is to provide users with valuable insights about sleep, wellness, and recovery without requiring wearable devices or significant changes to daily routines.

Developing technology capable of gathering meaningful health data through everyday fabrics, without requiring users to wear devices or change their daily routines, has required extensive market validation and commercialization planning. Nuream worked closely with the SBTDC Technology Commercialization team to explore sleep technology market opportunities, validate customer demand, refine commercialization strategies, and develop key industry partnerships. Those efforts helped position the company for growth and contributed to recent support from organizations including the

Department of Defense, AFPOA, NC IDEA, and NCInnovation. As Nuream moves toward commercialization, its innovative approach aims to help people better understand their sleep and overall health through a simpler, more accessible experience.

"SBTDC has been instrumental throughout our journey and we cannot say enough to the support, assistance and tough conversations throughout. Through one-on-one engagements, summer MBA internships, and discussion at NCInnovation events, we studied the sleep and sleeptech market dynamics, confirmed customer validation, identified go-to-market strategies for early adoption and scale, and developed critical partnerships with stakeholders. We cannot say thank you enough."

Rob Cooley, Co-Founder & CEO, Nuream

While their technologies, industries, and locations differ, these three companies share a common challenge: turning innovative ideas into successful businesses. Whether commercializing university research, developing technology to improve public health communications, or bringing a new sleep solution to market, each company faced critical questions about customer needs, market opportunities, funding, and growth.

The SBTDC Technology Commercialization team helps entrepreneurs answer those questions through customer discovery, market validation, commercialization strategy, SBIR/STTR funding assistance, and long-term business advising. By providing strategic guidance and connecting companies with resources across North Carolina's innovation ecosystem, the SBTDC helps innovators move promising ideas closer to market.



SBTDC Technology Commercialization team.

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**NORTH CAROLINA SMALL BUSINESS AND
TECHNOLOGY DEVELOPMENT CENTER (SBTDC)**

701 Corporate Center Drive, Suite 340
Raleigh, NC 27607
919-715-7272
info@sbtdc.org



FAYETTEVILLE STATE UNIVERSITY SECURES NEARLY \$500,000 UNC SYSTEM INVESTMENT FOR DEFENSE AND SECURITY RESEARCH

FAYETTEVILLE, N.C. – A research initiative led by Fayetteville State University professor Zhiping Luo, Ph.D., has been awarded nearly \$500,000 in first-year funding through the University of North Carolina System Research Opportunities Initiative, positioning the university to expand defense and security research with implications for homeland security, environmental monitoring and advanced manufacturing.

The UNC System ROI is funded by the North Carolina General Assembly to support some of the most innovative and important research projects within the system. Awards are designed to expand capacity in research areas that are strategically important to North Carolina.

For FSU, this award supports the Nano Consortium for Collaborative Research and Education to Advance Defense and Security through Sensing (NC-READS). The project is a three-year initiative developed by Luo, a professor in the Department of Chemistry, Physics and Materials Science.

The project received \$499,810 in first-year funding as part of a proposed three-year, \$1.5 million investment to strengthen North Carolina's defense and security research capacity and prepare students for careers in high-demand STEM fields.

Selected through a competitive review process among UNC System institutions, NC-READS builds on Luo's years of research leadership. The initiative also strengthens the research infrastructure Luo helped establish at FSU, including the Southeastern North Carolina Regional Microanalytical and Imaging Consortium and the Interdisciplinary Materials Research and Education Laboratory.

Luo said the proposal stood out because it addresses urgent domestic challenges while drawing on FSU's established research strengths. The initiative brings together faculty expertise across chemistry, materials science, physics and biological sciences. It also uses the university's existing research infrastructure, national laboratory partnerships and commitment to serving military-affiliated students and veterans.



Ganesha Bora, Ph.D. - FSU chief research officer

"This award capitalizes on those strengths by establishing NC-READS as a unique defense-focused nanotechnology hub in North Carolina," Luo said. "It will modernize research infrastructure, support faculty collaboration, train students and position FSU to compete for larger center-level grants in the future."

The consortium will bring together researchers from FSU, North Carolina State University, Argonne National Laboratory and the National Institute of Standards and Technology to advance next-generation sensing technologies with applications ranging from national defense and infrastructure protection to environmental monitoring and advanced manufacturing.

"FSU occupies a unique position within the UNC System because of its strong commitment to serving military-affiliated students and veterans," Luo said. "This connection makes FSU particularly well-positioned to conduct homeland security research while preparing students for careers in defense, security, advanced manufacturing and related STEM fields."

The initiative is designed to address challenges with both statewide and national significance. Research efforts will focus on technologies for radiation, toxic chemical and explosive detection. The project will also focus on electromagnetic interference shielding and on monitoring environmental contaminants, such as per- and polyfluoroalkyl substances

(PFAS) - synthetic "forever chemicals" and organophosphorus pesticides. The work has the potential to strengthen military readiness, homeland security, environmental surveillance, and public health efforts while supporting North Carolina's advanced manufacturing economy.

"NC-READS will provide an open platform for conducting interdisciplinary, cutting-edge research and delivering transformative STEM education in response to emerging nanotechnologies for national defense and homeland security," said Ganesha Bora, Ph.D., FSU chief research officer. "This consortium will engage a broad spectrum of student populations to develop a motivated and skilled workforce for the sector, with impacts extending across the state and the nation."

Beyond its immediate research goals, NC-READS is expected to strengthen partnerships among universities, national laboratories and industry while increasing FSU's competitiveness for future federal funding opportunities. University leaders view the initiative as a long-term investment in North Carolina's innovation ecosystem and the next generation of scientists, engineers and defense-sector professionals.



Zhiping Luo, Ph.D. - Department of Chemistry, Physics and Materials Science Professor

Collaborate with us. Learn more at uncfsu.edu/research.



OFFICE OF RESEARCH AND TECHNOLOGY INNOVATION

Dr. Ganesh Bora
Associate Vice Chancellor for
Research and Technology Innovation
(910) 672-1442
gbora@uncfsu.edu



Dr. Hao Feng (far right), Blue Cross/Blue Shield Endowed Professor of Urban Food Systems, shown here with his team, will be director of the new Urban and Community Food Complex. The complex is set to open this fall, and will include a creamery for ice cream production.

THE SWEET TASTE OF COMMUNITY ENGAGEMENT

THE UNIVERSITY FARM'S LATEST BUILDING IS A \$12 MILLION FOOD INNOVATION ENGINE, BUSINESS INCUBATOR AND NUTRITIOUS FOOD PROMOTER. BEST OF ALL, IT COMES WITH ICE CREAM.

A few months from now, a person may walk into N.C. A&T farm's \$12.2 million Urban and Community Food Complex with their arms laden with tomatoes from their backyard garden.

"I want to learn how to turn these into home-made salsa to sell at the Farmer's Market," they might say.

That request – and thousands of others like it, when the building reaches full use – will spark a chain reaction across the areas of research, teaching and outreach. Working with the building's personnel, the local grower could get a course in food product development, working up a recipe; changing it into salsa or pasta sauce; cooking a batch in the building's commercial kitchen; tasting and smelling the result in the sensory lab, and creating a package design with an agricultural marketer. By the time growing season is over, they may have a marketable product – or more than one, complete with packaging and a business plan. Another successful small-scale agricultural business could be under way.

Meanwhile, students within the college will be learning: biological engineers will learn by working with the waste products from processing. Food and nutritional science majors evaluate nutritional content, agribusiness students to develop marketing plans, testing products and evaluate their consumer appeal.

That's just one aspect of the Urban and Community Food Complex (UCFC)'s mission, according to Hao Feng, Blue Cross/Blue Shield Endowed Professor of Urban Food Systems and professor of food and bioprocess engineering. Feng is the building's director: to be a business technology incubator, geared toward local entrepreneurship for multiple crops.

"A big piece of the complex is to serve the local community," Feng said. "Many of the popular products we see in grocery stores started in someone's kitchen. We can make suggestions on what they can produce and then take home, to establish their own operation. They can use our kitchen or their own at home. We can help them form small company to sell it or they could take it to the farmer's market.

"We can transfer technology; we can patent. We want to have small companies established based on our technology."

In the food desert that is East Greensboro, the UCFC, set to open in 2026, is poised to be a shining star, where farm-fresh foods become commodities before visitors' very eyes.

Staffed by Feng and five other employees, the U.S. Department of Agriculture-funded building will include a creamery; a food innovation laboratory; a food quality laboratory; a food safety



Dr. Feng explains his microgreens research at the new complex. Feng researches new market opportunities for such North Carolina crops as muscadines and sweet potatoes.

A view of the creamery.

laboratory (Biosafety Level 2); a sensory laboratory; and a food processing pilot plant.

The space will also include a commercial kitchen and a creamery.

"There needs to be a driver for promoting access to nutritious, fresh food the East Greensboro area," he said. "As the largest college of agriculture among all HBCUs, we have a responsibility to be that driver."

Another part of the story is based on Feng's own Evans Allen-funded grant to study North Carolina crops, among them sweet potatoes, peanuts, muscadine grapes and ginger. In his vision, the university could have its own production lines for N.C. – based crops at the UCFC.

"Many universities have famous products produced by their farm or dairy," Feng said. "That could be us. We could have Aggie sweet potato products, or flavors for ice cream, like muscadine."

It's the prospect of ice cream that excites the taste buds of alumni, students and community members alike.

Long a product of N.C. A&T's Dairy Unit, farm-fresh milk, butter and ice cream were produced, packaged and sold in the dining hall from the university's opening in 1891 until 1964, when the university decided to buy the products externally instead. The UCFC will bring the sweetest piece of that process back, reintroducing Aggie Ice Cream, and possibly gelato and other frozen desserts, in its small-batch creamery.

"We are the only historically Black college and university in the country that has a dairy," Feng said. "Dairy products like ice cream are consumer favorites that also allow our faculty and students to cover dairy production along its entire continuum, from animal health, nutrition, reproduction and milk production, to consumption – value-added products, quality, safety, consumer research. That allows us to integrate our food and nutritional science program with our animal science program."

Aggie Ice Cream will not only be good to eat, it will also use the milk from the farm's primarily Jersey herd. The "A2A2" Jersey cows produce milk that may be easier for more people to tolerate and can help introduce children and community members to dairy products.

Students can help staff the creamery, but will also bring an element of youthful "coolness" to the project, suggesting names, flavors and formulations and helping to design packaging.

"Lots of students can benefit, from the entire experience," Feng said. "In my imagination, we'd have agricultural economics students analyzing the business side, and animal or plant science involved; food and nutritional science students can do marketing formulation; others can be a focus group, taking products to evaluate for smell, appearance, taste. On the production side, biological engineering students could develop waste plans or environmentally friendly production plans."

"This facility will add a new dimension to the entire university and enable us to better serve our stakeholders," Feng said. "I am thrilled that we will see this first-of-its kind facility established at A&T."

For more information, visit ncat.edu/caes and click "Agricultural Research."



NORTH CAROLINA AGRICULTURAL AND TECHNICAL STATE UNIVERSITY
AGRICULTURE AND ENVIRONMENTAL SCIENCES

North Carolina Agricultural and Technical State University
1601 E. Market Street
Greensboro, NC 27411
336-334-7500