MSU RESEARCH

MAKING AN IMPACT IN MISSISSIPPI & BEYOND

WWW.RESEARCH.MSSTATE.EDU

MISSISSIPPI STATE UNIVERSITY™
OFFICE OF RESEARCH AND
ECONOMIC DEVELOPMENT

WORKING FOR MISSISSIPPI, WORKING WITH YOU

Mississippi State University (MSU) is working for Mississippi, for the nation, and for the world—and we are ready to work with you. MSU's overall economic impact for the state is **$1.8 billion**, with an impact of research activities alone of **$506.2 million**.

MSU's research expenditures totaled $303.4 million in FY 2022, accounting for more than half of the total research and development expenditures reported by all Mississippi institutions. MSU holds the "Very High Research Activity" designation from the Carnegie Foundation.

MSU research and economic development initiatives are focused on creating jobs, enhancing quality of life, and providing real-world opportunities for our students and alumni, who are the next generation of innovators, inventors, and leaders.

For decades, we have worked closely with local, state, and federal officials to help recruit industries and domestic and international investments to our state. We've built partnerships between the university, economic development organizations, and businesses to create high-wage jobs and to leverage our innovative research activities.

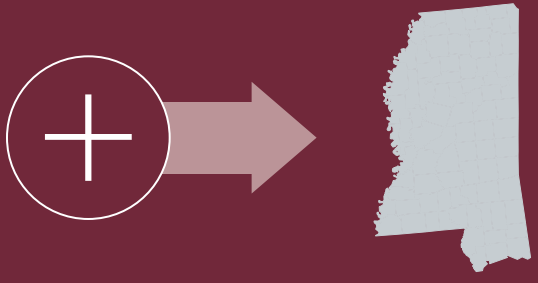
MSU will continue to play an important role as our nation's economy continues to grow—in large part because of our faculty's preeminence in critical research focus areas like cybersecurity and advanced computing, uncrewed aircraft and aerospace, agriculture and natural resources, engineering and materials science, and automotive and mobility systems.

For more information, contact our Corporate Engagement and Economic Development office at 662-325-3276 to learn more about MSU's capabilities, capacity, and services for business and industry.

POSITIVELY IMPACTING MISSISSIPPI (added income)

$506.2 million
TOTAL IMPACT OF RESEARCH

$1.8 billion
TOTAL IMPACT OF MSU



$213.1 million
Research spending impact

+

$15.2 million
Research-related start-up company impact

+

$32.6 million
CAVS-E impact

+

$245.3 million
Extension impact

THAD COCHRAN RESEARCH, TECHNOLOGY, & ECONOMIC DEVELOPMENT PARK

The park is an economic engine that has created high paying jobs, enhanced quality of life, and strengthened the industrial base in the region. The 272-acre park is now home to more than 1,400 employees, 12 buildings and a diverse lineup of tenants, including private businesses, start-up companies, government offices and robust research centers and institutes. This represents over $100 million in infrastructure investment, over $104 million in private capital investment, and a FY19 economic impact from private tenants that exceeds $62 million. Additionally, the park is a popular destination for cycling, running, and walking. The park's MSU-affiliated research centers have nurtured key expertise and capabilities for the state, in addition to enhancing the reputation of the university and the region.

HIGH PERFORMANCE COMPUTING COLLABORATORY (HPC2)

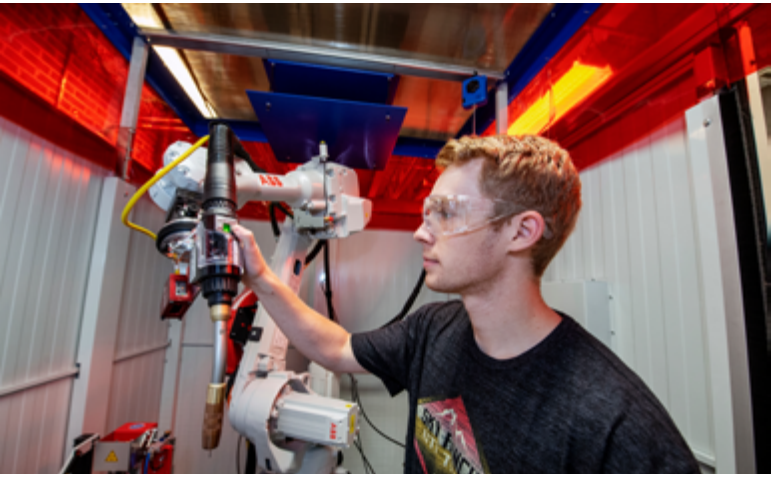
The High Performance Computing Collaboratory (HPC2) at MSU is a coalition of member centers and institutes that are focused on multidisciplinary, team-oriented research activities for the application and advancement of computational science and engineering. The member units heavily emphasize applied research and are committed to a full partnership between education, research, and service. HPC2 is home to one of the fastest supercomputers in U.S. academia.

The HPC2 provides an advanced computing infrastructure that includes high performance computing systems, high performance storage systems, a high-capacity data archival system, high-bandwidth local and wide-area networking, and a large deployment of robust desktop workstations. This extensive array of equipment provides support for a wide range of application disciplines including, but not limited to, fluid dynamics, structural mechanics, materials modeling, vehicle autonomy, astrophysics, molecular modeling, cybersecurity, weather and ocean modeling, geographic information systems, and bioinformatics.

MSU boasts two systems, Orion and Hercules, that are ranked among the most powerful systems in the world.

Member Centers and Institutes include:

- Alliance for System Safety of UAS through Research Excellence (ASSURE)
- Center for Cyber Innovation (CCI)
- Center for Computational Sciences (CCS)
- Geosystems Research Institute (GRI)
- Institute for Computational Research in Engineering and Science (ICRES)
- Center for Advanced Vehicular Systems (CAVS)
- CAVS Extension (CAVS-E)
- Institute for Imaging & Analytical Technologies (I2AT)
- Institute for Systems Engineering Research (ISER)
- Institute for Genomics, Biocomputing & Biotechnology (IGBB)
- Northern Gulf Institute (NGI)



CENTER FOR ADVANCED VEHICULAR SYSTEMS (CAVS)

The Center for Advanced Vehicular Systems (CAVS) at MSU is an interdisciplinary center comprised of research, engineering design and development, and technology transfer teams for industry and government partners.

CAVS is a world-class center of excellence for research, technology, and education equipped to address engineering challenges facing U.S. mobility industries. Utilizing high performance computational resources and state-of-the-art analytical tools for modeling, simulation, and experimentation, CAVS provides a distinctive, interdisciplinary environment wherein next-generation engineers and scientists train alongside field experts to investigate, design, and verify novel solutions in materials, propulsion, and design for efficient human and vehicle mobility. Harnessing our broad impact research along with our state, national, and international industrial alliances, CAVS supports economic development and outreach activities throughout the State of Mississippi.

WWW.CAVS.MSSTATE.EDU

CAVS EXTENSION (CAVS-E)

The Center for Advanced Vehicular Systems Extension (CAVS-E), located in Canton, Mississippi, with satellite locations on the Mississippi Gulf Coast and in the Golden Triangle, provides technical assistance and professional development training to advanced manufacturers around the state. The center is committed to advancing technologies and practices to ensure the competitiveness of Mississippi industry.

CAVS-E strives to provide business and industry best practices through industry education, training, and professional development programs. The center also provides access to advanced engineering tools and concepts related to product design, manufacturing, and assembly processes. Innovative capabilities developed to meet the needs of the automotive industry are leveraged to benefit other manufacturing sectors across the state.

The center's programs have been recognized both nationally and regionally for its work in advancing economic development in Mississippi. CAVS-E often partners with economic developers in the state when helping locate new and expanding industry by providing proven experience and knowledge-based concepts in effective plant layout and manufacturing plans, as well as business and industrial systems.

CAVS-E ECONOMIC IMPACT $7,293,031,562*

Amount reported from January 1, 2006 to December 31, 2023

Increased/retained sales	$6,286,859,460
Cost savings/avoidance	$146,446,646
Plant/equipment investment	$538.201,082
Workforce skills investment	$10,467,869
New products and processes	$311,056,505
Jobs created/retained	7.327

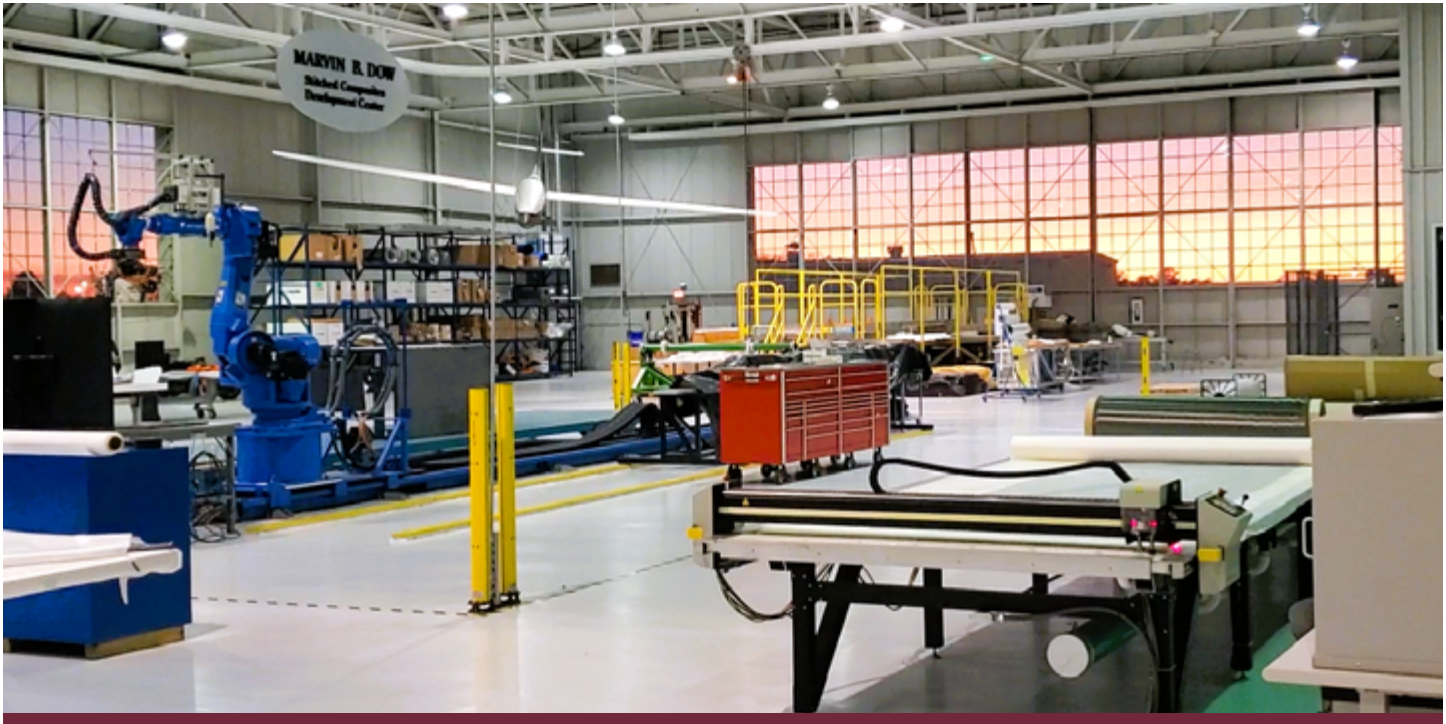
*Economic impact amounts are collected and verified by the U.S. Department of Commerce and should not be added or compared to MSU's economic impact study conducted by Emsi.

WWW.CAVSE.MSSTATE.EDU

ADVANCED COMPOSITES INSTITUTE (ACI)

- Hi Rate Composite Manufacturing
- Tech Readiness for Aerospace Resin Infusion
- Rapid turn thermoset AM tooling
- Z-axis reinforcement for damage arrestment
- Demonstration of BWB airframe manufacture
- Extreme environment materials (Hypersonics)

The Advanced Composites Institute (ACI) serves as a leading university and industry research hub dedicated to advancing cutting-edge composite technologies across vital sectors and enhancing the composites workforce. The Institute excels in supporting groundbreaking, interdisciplinary projects that tackle fundamental and broad challenges in aerospace, civil engineering, military applications, energy, automotive, and other essential industries. ACI is keenly aware of evolving market needs, trends, and gaps, and strategically invests in developing expertise and capabilities that address pressing real-world issues. With access to world-renowned composites experts, the ACI is committed to fostering sustainable, organic growth in both its technological capabilities and its expertise.



SELECTED CAPABILITIES

- 28,000 sq ft High Bay
- 50ft Programmable Curing Oven
- 40ft x 8ft 6-axis stitching robot
- 4ft x 6ft RTM Press
- 8ft 3D Thermoset Printer
- AS9100 Certified
- 12 ft CNC Router
- ASC Composites Autoclave
- 3D Inspection
- Process Simulation
- Material Testing

ALLIANCE FOR SYSTEM SAFETY OF UAS THROUGH RESEARCH EXCELLENCE (ASSURE)

ASSURE, the Alliance for System Safety of UAS through Research Excellence, led by Mississippi State University, stands at the forefront of Unmanned Aircraft Systems (UAS) and autonomy applied research. The alliance is comprised of 30 research institutions consisting of 19 Core Universities and 11 Affiliate Universities, including 5 international schools, 4 FAA Test Sites, and the FAA's Safety Research Facility. ASSURE's mission focuses on providing high-quality research and support to autonomy stakeholders within the US and globally, ensuring the safe and efficient integration of autonomous systems into the national and internatio nal infrastructure. This commitment not only enhances commerce but also significantly boosts overall public safety and benefits.

Current work covers critical areas such as safety risk management for Detect and Avoid (DAA) systems, increasing small UAS conspicuity, UAS traffic integration and management, and cyber security concerns. ASSURE's commitment to translating research into practical applications is evidenced by ongoing and future projects. The organization's work continues to attract attention across government and industry sectors, underlining its role as a pivotal player in the advancement of UAS technology.

The vision remains clear: ASSURE aims to be the premier research organization for tackling complex autonomy issues, with a focus on UAS policy, regulations, standards, training, operations, and education. Gratitude extends to the dedicated team, esteemed partners, and valued stakeholders for their unwavering support. Together, new frontiers in UAS research are being pioneered, reshaping the future of unmanned and autonomous systems.

NORTHERN GULF INSTITUTE (NGI)

The Northern Gulf Institute (NGI) is a National Oceanic and Atmospheric Administration (NOAA) Cooperative Institute comprised of six academic institutions that are geographically distributed across the U.S. Gulf Coast states.

The six NGI member institutions are Mississippi State University (lead), the University of Southern Mississippi, Florida State University, Louisiana State University, the University of Alabama in Huntsville, and the Dauphin Island Sea Laboratory.

Together with NOAA and in support of their strategic plan, NGI conducts research on interconnections among Gulf of Mexico environments, habitats, resources, and people and engages in outreach to help others learn about and make decisions based on these interconnections.

NGI's academic members have broad science and research expertise. As members of a NOAA Cooperative Institute, they focus on the Gulf of Mexico region as they address NOAA's overriding priorities:

- Build a climate ready nation,
- Make equity central to NOAA's mission, and
- Accelerate growth in an information-based blue economy.

These NOAA priorities are integrated into NGI's four research themes: climate change and variability effects on regional ecosystems, coastal hazards, ecosystem management, and data management systems supporting a data-driven economy.

RASPET FLIGHT RESEARCH LABORATORY (RFRL)

The Raspet Flight Research Laboratory (RFRL) is one of the premier academic flight research facilities in the nation. Established at MSU in 1948 by aviation pioneer Dr. August Raspet, this aeronautical research laboratory boasts a rich heritage of full-scale flight vehicle development and testing, unmanned aircraft systems (UAS) research, development, test, and evaluation (RDT&E), and advanced composite materials development and fabrication.

RFRL has the capability to design, build, and test prototypes of full-scale crewed and uncrewed aircraft, and has engaged in a broad spectrum of composite prototyping and flight test activities, ranging from the development and fabrication of the first turbine-powered composite aircraft and the first all-graphite turbofan business jet, to the development of uncrewed aircraft systems and components.

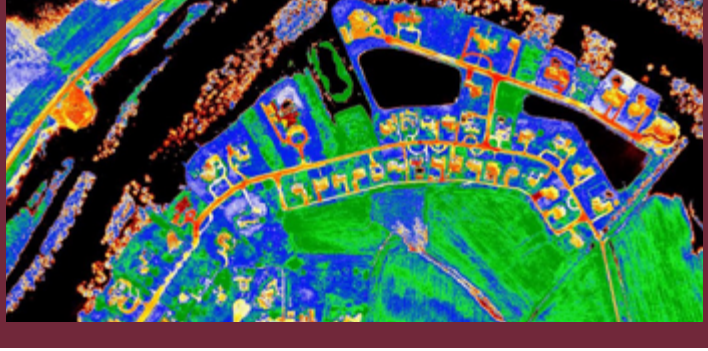
As MSU's research lead for the Federal Aviation Administration's (FAA) UAS Center of Excellence, RFRL directs and coordinates FAA-sponsored uncrewed systems research in partnership with 22 of the nation's leading aviation research universities, including evaluating cutting-edge technologies for airspace integration, safety, autonomy, and pilot performance. RFRL also owns and operates a fleet of the largest, most powerful, and most sophisticated uncrewed aircraft in academic use today, supporting remote sensing and aircraft performance testing over land and

UAS Test Sites, conducting operational and technical evaluations of uncrewed systems technology to support the U.S Coast Guard, Customs and Border Protection, the Federal Emergency Management Agency, the U.S. Secret Service, and a host of other DHS agencies and functions. RFRL's evaluations and exercises help train, equip, and support the brave men and women who protect our borders, patrol our coasts, respond to national emergencies, and secure our airports.

With MSU's executive leadership of the FAA's UAS Center of Excellence and extensive capabilities in composite materials research and develeopment, no other university in the country compares to MSU's national leadership in the fields of uncrewed systems and advanced composites technologies.

GEOSYSTEMS RESEARCH INSTITUTE (GRI)

The Geosystems Research Institute (GRI) provides capabilities in remote sensing, computational technologies, visualization techniques, agriculture and natural resource management, and the transition of these into operational agency research, planning, and decision-support programs. GRI has developed nationally recognized research strengths with strong relationships and inherent respect from state, regional, and national agencies and business entities. GRI provides assistance in harnessing the knowledge and technology in earth and its systems, integrating geosystems science and engineering, translating geospatial technologies into useful tools and skills, and transitioning science and technology into practice to support GRI's stakeholders and improve policy and public awareness.



AGRICULTURAL AUTONOMY INSTITUTE (AAI)

MSU launched the Agricultural Autonomy Institute with the goal of developing Mississippi's economy by forming an industry in autonomous systems for agriculture. Generous seed funding from the Robert M. Hearin Foundation was used to establish AAI as the first institute in the U.S., likely the world, dedicated strictly to autonomous systems for agriculture. Over the long term, AAI intends to position Mississippi as the Silicon Valley of agricultural autonomy.

AAI's scope of research and development includes applications in production agriculture, post-harvest processing, and tools and methods for agricultural research. The institute brings together MSU's robust expertise in agriculture and autonomous systems, with collaborators across many academic departments and research centers.

AAI has three key objectives: (a) to conduct research and to develop intellectual property for licensing and entrepreneurial startups; (b) to recruit corporations to Mississippi in terms of contracted research and creation of new facilities for research, manufacturing, distribution, and service; and (c) to build the needed workforce through educational programs at MSU and in collaboration with community colleges in Mississippi.

In addition to growing Mississippi's economy, providing advanced farm-related jobs and equipping workers for these jobs, and maintaining food security, AAI is committed to advancing sensing and analytical capacities of autonomous machinery systems, thus enabling decisions and actions at the level of a square meter or even a single plant.

WWW.AAI.MSSTATE.EDU

DIVISION OF AGRICULTURE, FORESTRY & VETERINARY MEDICINE

The MSU Division of Agriculture, Forestry and Veterinary Medicine, or DAFVM, embodies MSU's national land-grant mission of teaching, research, and service. Our commitment to growing food and fiber, conserving natural resources, and delivering reliable education has remained strong since MSU was first created in 1878.

DAFVM has six units: the College of Agriculture and Life Sciences, the Mississippi Agricultural and Forestry Experiment Station, the College of Forest Resources, the Forest and Wildlife Research Center, the College of Veterinary Medicine, and the MSU Extension Service.

Each unit carries out the university's trifold mission statewide, whether at the main MSU campus or one of four research and Extension centers, 16 branch stations, or Extension offices in all 82 counties. Clients include college students, agriculture and forestry producers, agribusiness and industrial firms, families, youth, local government entities, and numerous other organizations.

Our stewardship of research dollars helps farmers compete in world markets. MSU research and Extension outreach are helping Mississippi agricultural industry professionals survive brutal markets and other risks, and students are receiving training to become the agricultural leaders of tomorrow.

Today, we are developing new production systems, improving production practices, and researching new crop varieties. We are developing autonomous equipment and forest-management systems. DAFVM is forming the future of Mississippi agriculture and forestry today.

GLOBAL CENTER FOR AQUATIC HEALTH & FOOD SECURITY

Established in 2013, the Global Center for Aquatic Health and Food Security (GCAHFS) aims to reduce world hunger through research that supports sustainable aquaculture and ecological health of aquatic resources. GCAHFS also works towards protecting and managing the health of aquatic animals, including marine mammals and endangered species. The center supports both domestic and international projects in a wide range of natural and social science areas. GCAHFS is affiliated with the MSU College of Veterinary Medicine.

GCAHFS engages MSU's faculty, staff, and students in worldwide development of aquaculture and fisheries. The projects under GCAHFS aim to improve aquatic health, reduce world hunger, and build capacity for healthy aquatic ecosystems, sustainable aquaculture, and fisheries.

GCAHFS addresses aquatic environments' health by improving the impact they have on the quality of life of humans, increasing food production and security, implementing aquatic animal disease mitigation strategies, supporting aquaculture technology development and adoption, and promoting sustainable aquatic resource management.

GCAHFS houses the Food and Agriculture Organization of United Nations Reference Center on Antimicrobial Resistance and Aquaculture Biosecurity, the Feed the Future Innovation Lab for Fish, and the Gulf Coast Aquatic Health Program. In addition, faculty affiliated with GCAHFS are leading research and outreach projects around the world engaging students to conduct innovative research and provide sustainable solutions.

WWW.GCAHFS.MSSTATE.EDU

MISSISSIPPI CYBER INITIATIVE (MCI)

The Mississippi Cyber Initiative (MCI) was created to meet the challenges of the cybersecurity reality in the state and around the nation and position Mississippi as a leader in a field that will be of critical importance in the years and decades ahead.

The mission of MCI is to provide statewide leadership that prepares Mississippi's future economy through unparalleled collaboration and innovation in cybersecurity. The MCI serves as an economic development catalyst leveraging the collective expertise among academia; the private sector; state, federal and local government; law enforcement; the U.S. Department of Defense; and the Mississippi National Guard.

MCI was created following multiple successful collaborations between Mississippi State University and the 81st Training Wing at Keesler Air Force Base, a major cyber training hub for the Air Force. MCI efforts based on the Gulf Coast are already making an impact for stakeholders in defense, law enforcement, industry and education as new capabilities and collaborations are developed.

The Mississippi Cyber and Technology Center will serve as the long-term headquarters for the Mississippi Cyber Initiative. MSU Research and Technology Corp. is working with the Air Force to build the Cyber and Technology Center on property adjacent to Keesler AFB. Long-term plans include the development of a Cyber and Innovation Campus consisting of three buildings.

WWW.MSCYBERINITIATIVE.ORG

CENTER FOR CYBER INNOVATION (CCI)

The Center for Cyber Innovation (CCI) mission serves as a focal point for academic, government, and commercial resources to pursue cyber technologies, apply unbiased expertise, provide rapid and relevant research solutions, and integrate these solutions into applications and products. CCI will research, prototype, deliver and provide cutting-edge technological and operational solutions to complex problems for U.S. Government, scientific community and commercial (domestic and international) customers. CCI serves as an economic development generator by producing cyber solutions with commercial applications.

Part of MSU's High Performance Computing Collaboratory, CCI develops cutting-edge solutions for Defense, Homeland Security and the intelligence community. The primary focus of the CCI is to research and prototype new and novel cyber solutions that support global national security, homeland security and peacekeeping operations.

The center is a key part of MSU's efforts in cybersecurity, which includes a robust National Science Foundation Cyber Corps. MSU is one of only a few universities designated as a Center of Academic Excellence by the National Security Administration in Cyber Operations, Defense and Research. MSU's cyber operations strengths include reverse engineering, wireless security and cyber physical systems.

WWW.CCI.MSSTATE.EDU

CENTER FOR CYBER EDUCATION (CCE)

The MSU Center for Cyber Education conducts a broad range of outreach activities related to cybersecurity awareness and K-12 computer science education, helping position Mississippi to compete in a digitally-driven economy. In partnership with the Mississippi Department of Education, the center leads the development and maintenance of Mississippi's K-12 computer science curriculum and teacher professional development. The center has trained more than 3,000 teachers so they can incorporate computer science concepts and courses in their schools. Additionally, CCE leads cybersecurity awareness efforts for Mississippi small businesses and hosts cyber certification training to grow and strengthen the cybersecurity workforce.

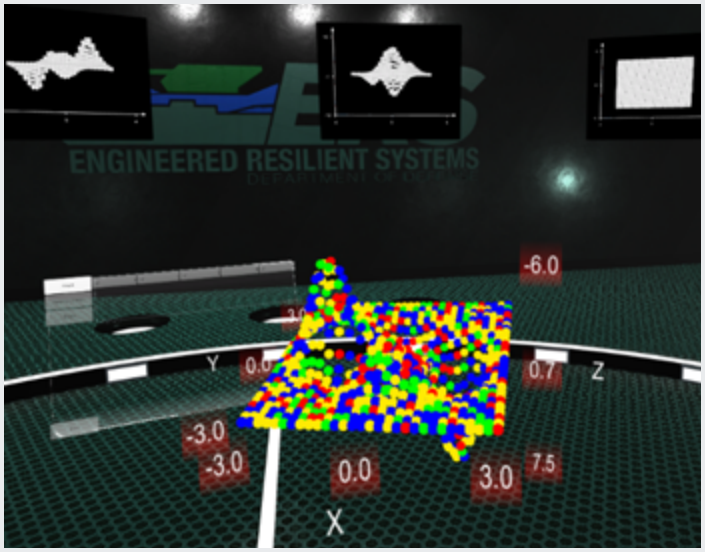
INSTITUTE FOR CLEAN ENERGY TECHNOLOGY (ICET)

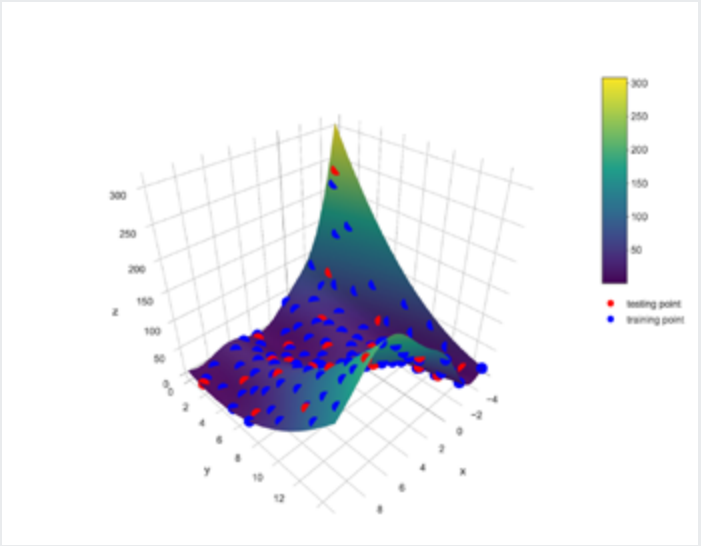
MSU's Institute for Clean Energy Technology (ICET) is primarily a measurement and testing laboratory associated with nuclear technologies. ICET is internationally recognized for its ability to evaluate nuclear grade HEPA filters under extreme conditions. This includes provision of decision quality data consistent with nuclear quality assurance requirements. ICET research has assisted Department of Energy Office of Environmental Management (DOE-EM) sites for over 40 years. Additionally, ICET's radioactive detection capabilities have been incorporated in platforms used to survey sites to detect radiological contamination. A variety of deployment platforms have been developed for application at Department of Defense (DoD) facilities where depleted uranium penetrators have been fired. ICET's primary areas of expertise are optimized to address specific problems of its DOE and DoD customers. However, these technologies can also be used to assist Mississippi industry.

WWW.ICET.MSSTATE.EDU

INSTITUTE FOR SYSTEMS ENGINEERING RESEARCH (ISER)

The Institute for Systems Engineering Research was officially created in 2014, with the signing of the ISER charter between the U.S. Army Engineer Research and Development Center and Mississippi State University. The Institute's research vision is to revolutionize system engineering processes and virtual prototyping through computational science and engineering leading to a dual use capacity that will enhance innovation in the Department of Defense and the U.S. industrial base. ISER is a collaborative member of the MSU High Performance Computing Collaboratory and partners with other HPC centers in emerging research areas; with the Center for Advanced Vehicular Systems (CAVS) in areas of virtual and augmented reality and artificial intelligence and with the Center for Advanced Vehicular Systems – Extension (CAVS-E) to support the efforts of the center in Mississippi manufacturing.





MISSISSIPPI WATER RESOURCES RESEARCH INSTITUTE (MWRRI)

The Mississippi Water Resources Research Institute administers and coordinates research programs dealing with water and related resources. Its activities are developed in close consultation and collaboration between the institute and leading water resources officials within the state.

The purpose of the program is to provide coordinated research and development that contributes to the solution of water and water-related land use problems in Mississippi, the region, and the nation.

THE INSTITUTE'S GOALS:

- To provide a center of expertise in water and associated land-use problems and serve as a repository of knowledge for use in education, research, planning, and community service
- To serve public and private interests in the conservation, development, and use of water resources
- To provide training opportunities in higher education whereby skilled professionals become available to serve government and private sector
- To assist planning and regulatory bodies at the local, state, regional, and federal levels
- To communicate research findings to potential users in a form that encourages quick comprehension and direct application to a water-related problem
- To assist state agencies in the development and maintenance of a state water management plan

PAUL B. JACOB HIGH VOLTAGE LABORATORY

The Paul B. Jacob High Voltage Laboratory at MSU serves as an independent, university center for high voltage engineering. The laboratory focuses on high voltage research, evaluation, and education. This multi-purpose high voltage facility is designed to meet the evaluation needs of the industry and provide the necessary environment for academic research in high voltage engineering. As an integral part of our national high voltage technology structure, the laboratory serves as a means of strengthening the U.S. position in this specialized technical area.

The High Voltage Laboratory was constructed in 1977 and is the largest university operated high voltage laboratory in North America, enabling full-scale evaluation of large equipment with impulses up to 3000 kV and 1000 kV AC-voltage.

WWW.ECE.MSSTATE.EDU/HIGH-VOLTAGE-LAB

ATHLETE ENGINEERING INSTITUTE (AEI)

The Athlete Engineering Institute (AEI) is a cutting-edge research organization at the intersection of multiple engineering disciplines, kinesiology, nutrition, athletics, fashion design and textiles. The AEI has built a robust network of long-term collaborations with academic departments, research centers, and MSU athletic teams focused on wearable technology design and validation, human performance assessment, injury mitigation, and entrepreneurship.

Athletic ability isn't just for sports—AEI recognizes four Human Athlete Personas: Tactical Athletes, like military warfighters and emergency responders; Industrial Athletes, who are workers performing repetitive tasks in manufacturing, warehousing, logistics, and service industries; At-Risk Athletes, including chiropractic and medical patients in rehab and recovery; and traditional Athletes, who are students and professionals competing in sports.

The research team at the AEI focuses on several key areas including design and validation, injury mitigation, advanced manufacturing training and education, use of artificial intelligence, and digital twinning technology. The AEI employs a variety of cutting-edge technology to support research, development, education, training, and workforce preservation activities. Whether analyzing injury risk in athletes using the Gait Real-time Analysis Interactive Lab (GRAIL), or studying movement using wireless motion capture cameras assessing subjects wearing sensors woven into fabric, the AEI is equipped with the tools researchers require.

NATIONAL STRATEGIC PLANNING & ANALYSIS RESEARCH CENTER (NSPARC)

NSPARC, the National Strategic Planning & Analysis Research Center at Mississippi State University (www.nsparc.msstate.edu), is a trusted source for research addressing critical challenges faced by government, economic and workforce development professionals, educational institutions, nonprofits, and the private sector. NSPARC's team of social scientists, economists, data engineers, data analysts, and machine learning experts use applied research to drive real-world applications.

Empowering Data-Driven Decisions: NSPARC has over two decades of hands-on experience in studying, aligning, and analyzing data for clients. NSPARC researchers are experts at identifying the best data sources and research methods to answer questions and support decision making.

Evaluating Program and Policy Outcomes: With expertise in sociological research and data analysis, NSPARC's scientists excel in program, policy, and intervention evaluation. The center's research team actively supports clients in measuring the effectiveness of specific initiatives and provide actionable insights for improvement.

Assessing Returns on Investments: NSPARC's economists are experts in conducting return on investment (ROI) studies for government agencies, private corporations, and academic institutions. These assessments empower stakeholders to make informed decisions about resource allocation and prioritize investments in effective programs.

Constructing Predictive Models to Forecast Future Trends: NSPARC harnesses statistics, mathematics, and data engineering to develop predictive models and machine learning solutions. These models and tools help organizations align programs and policies with current trends and future expectations; making better decisions based on what is expected to happen, not just what has happened in the past.

Conducting Use-Inspired Research: NSPARC tackles real-world problems by developing innovative, data-driven approaches specifically tailored to complex social, cultural, and economic challenges. Using primary data and insights into community-specific experiences, NSPARC's scientists develop targeted interventions and evidence-based solutions that truly make a difference on the ground.

SOCIAL SCIENCE RESEARCH CENTER (SSRC)

With over 70 years of history, the MSU Social Science Research Center works to conduct research on social, economic, political, human resource and social-environmental problems facing the state, nation and world. It provides a support system for the university to plan, develop, secure funding for and conduct social research on problems of interest to the scientific community and to consumers of research findings.

The SSRC, from its origin, has emphasized interdisciplinary research and the application of social science knowledge to the most critical problems facing the state, region, and nation. Collaboration across disciplines, institutions, and even nations is an essential feature of the SSRC's research and outreach. Strong collaboration with academic departments has led to the establishment of several social science laboratories that greatly enhance the university's capabilities to carry out research projects that impact communities and generate new knowledge.

SSRC's focus areas and expertise include evaluation, genders inequalities, survey research, policy and systems change, substance abuse, data science, juvenile justice, communication science and public health.

WWW.SSRC.MSSTATE.EDU

RESEARCH AND CURRICULUM UNIT (RCU)

Founded in 1965, the Research and Curriculum Unit contributes to Mississippi State University's mission as a land-grant institution to better the lives of Mississippians with a focus on improving education.

In particular, the RCU benefits K-12 and higher education by developing curricula and assessments, providing training and learning opportunities for educators, researching and evaluating programs, supporting and promoting career and technical education, and leading education innovations.

The RCU empowers educators and students to meet the challenges of life, with a team of nationally recognized experts working to improve career and technical education in Mississippi. RCU strives to create academic course content that combines academic rigor with real-world relevance. Our experienced and highly qualified team of experts write the CTE curricula utilized by high school programs throughout the state.

Using versatile teaching styles combined with the latest delivery methods, we encourage educators to implement innovative teaching strategies to instruct a variety of learners. Professional development sessions are designed based on a core philosophy of lifelong learning and continuous improvement. RCU's assessment team measures the performance of CTE programs and facilitates national certifications.

MISSISSIPPI INSTITUTE ON DISABILITIES (MIOD)

The College of Education's Mississippi Institute on Disabilities (MIoD) at Mississippi State University has three primary goals: 1) Conduct groundbreaking research on disability intervention and support across the spectrum of physical and cognitive disabilities; 2) Train high quality future practitioners and researchers to work in disability related fields; and 3) Serve individuals and families in the community with various disabilities and needs. As a land-grant university, these goals map directly onto the purpose of Mississippi State University's mission to enhance the quality of life for Mississippians.

The Institute houses two primary research and service centers, the T.K. Martin Center for Technology and Disability (TKMC) and the Autism and Developmental Disabilities Clinic (ADDC). The TKMC has served Mississippians and beyond for over nearly three decades primarily in the areas of assistive technology and related programming. The ADDC was established in 2014 at Mississippi State University as the flagship autism clinic providing comprehensive psychological, educational, and behavioral services to children with autism and related disorders, across northern and central Mississippi.

Much of the research done across MIoD is field-based clinical research leveraging data collected during assessment and intervention services with individuals with disabilities. We must tackle the present needs for persons with disabilities and by engaging in field-based research, we not only gather the necessary tools for advancing research on disabilities, we also provide direct care to those we serve.

CENTER FOR ENTREPRENEURSHIP & OUTREACH (CEO)

The Center for Entrepreneurship and Outreach (CEO) works with MSU's students, faculty, and our community abroad to start and grow successful companies. CEO helps connect entrepreneurs to valuable relationships, delivers short training workshops on business modules, and works one-on-one to develop business models built for growth. One of the key value-adds to community members is providing access to top business student research teams who conduct in-depth analysis on complex business questions and deliver recommendations in comprehensive reports on areas such as: market research, regulatory reviews, competitor analysis, IT system design, and prototyping assistance. The CEO works with everyone from mom-and-pop start-ups looking to open on Main Street to large corporations like Yokohama Tire who are creating opportunities for thousands of Mississippians.

MISSISSIPPI STATE CHEMICAL LABORATORY (MSCL)

The MSCL is a state-appropriated regulatory agency situated on the campus of MSU. It is integral to safeguarding the quality and safety of agricultural and environmental resources in the State of Mississippi. By providing reliable, high-quality analytical services and supporting regulatory compliance, MSCL plays a crucial role in supporting the state's economic growth, environmental sustainability, and public health.

Capabilities and Services

The MSCL is dedicated to empowering agribusinesses, consumers, and industries across Mississippi. It is an ISO 17025 accredited laboratory specialized in testing human food, animal feed, fertilizers, agricultural liming, and petroleum products sold in Mississippi, as well as environmental and industrial samples. MSCL's testing for inorganic compounds and pesticide residues in groundwater ensures safe drinking water. Our environmental monitoring services, in partnership with federal agencies, analyze soil, water, plant and animal tissue, and air samples to assess and mitigate environmental pollution. Furthermore, our mycotoxin analysis and food surveillance programs ensure food and feed products are safe for consumption. In times of crisis, our emergency response team provides rapid analysis and support for chemical spills, contamination events, and other environmental chemical emergencies.

Engaging in research, MSCL develops new methods for chemical analysis and environmental monitoring. We partner with academic and industry stakeholders to address emerging environmental and agricultural challenges.

WWW.MSCL.MSSTATE.EDU

INSTITUTE FOR IMAGING & ANALYTICAL TECHNOLOGIES (I2AT)

The Institute for Imaging and Analytical Technologies (I2AT) provides access to specialized research tools that enable innovators to advance cutting-edge research and commercialize new technologies by observing and analyzing structures at multiple scales. By offering advanced facilities and expertise, I2AT enhances the competitiveness of local industries through a cost-effective approach that improves the quality and impact of their work. Additionally, the hands-on training provided by I2AT prepares a scientifically skilled workforce built for the future.

The ability to view things at different scales provides a deeper understanding

KEY CAPABILITIES INCLUDE:

- External morphology (texture), chemical composition, and crystalline structure & orientation of small samples
- Mechanical, Electrical and Magnetic Properties
- High resoulution images of small objects
- Metal failure analysis, assembly inspection and part-to-CAD comparison

WWW.I2AT.MSSTATE.EDU

of complex systems, leading to innovative solutions and advancements in various fields of research. I2AT provides advanced microscopy, x-ray, and surface analysis capabilities that support world-class research across key focus areas such as:

Life Sciences: The electron microscopes at I2AT enable the study of complex biological systems at the micro scale, supporting research that can lead to new medical treatments and advancements in agriculture.

Materials Science: The atomic force microscope along with microanalysis tools help in understanding material properties and behaviors. This detailed analysis supports the development of new materials with optoelectronic, sustainable energy and biomedical applications.

Engineering: X-ray computed tomography is a nondestructive technique that visualizes interior features of solid objects, aiding in the design and optimization of structures for a variety of applications including additive manufacturing and aerospace.

- Viscosity of emulsions, paints, coatings, slurries, polymers and plastics
- Analyze sample structure and texture on a molecular level
- Analysis of biological structures

POINTS OF PRIDE

MSU's Athlete Engineering Institute is leading industrial safety and human performance initiatives with major Mississippi manufacturers such as Toyota Mississippi and HII's Ingalls Shipbuilding.

Boasting decades of excellence in high performance computing, MSU is among the largest academic supercomputing centers in the U.S.

MSU is on the cutting edge of research and integration into the nation's airspace, serving as the national lead university for the FAA's Center of Excellence for Unmanned Aircraft Systems and as the FAA's UAS Safety Research Facility.

The National Science Foundation ranks MSU in the nation's top 5% for agriculture and natural resources – a position it has held for over two decades.

As home of the Feed the Future Innovation Lab for Fish funded by USAID, Mississippi State is leveraging its proven expertise to improve nutrition, food security and livelihoods in developing countries by supporting the sustainable development of aquaculture and fisheries.

As a leader in cutting-edge research aimed at advancing the nation's military, MSU is supporting the Department of Defense's mission by developing a high-performance computing-based environment for next-generation ground vehicles.

Mississippi State is home to the Teros, the largest, most sophisticated uncrewed aircraft at any U.S. academic research institution and is expected to be the first of its kind certified by the FAA for complete future integration into the national airspace system.

Mississippi State researchers are studying wetland restoration efforts along the Gulf of Mexico to evaluate effective marsh terrace designs that will maximize coastal restoration, sustainability and ecosystem productivity.

MSU has been designated as an Innovation and Economic Prosperity University by the Association of Public and Land-Grant Universities since 2015.

IN CONCLUSION

These are just a few examples of the impact we're making in our communities, across the nation, and around the world.

We anticipate the university's role becoming more important as the state's economy continues to grow—in large part because of our faculty's preeminence in critical research focus areas like cybersecurity and advanced computing, unmanned aircraft and aerospace, agriculture and natural resources, engineering and materials science, and automotive and mobility systems.

MSU is working for Mississippi and our nation—and we are ready to work with you.

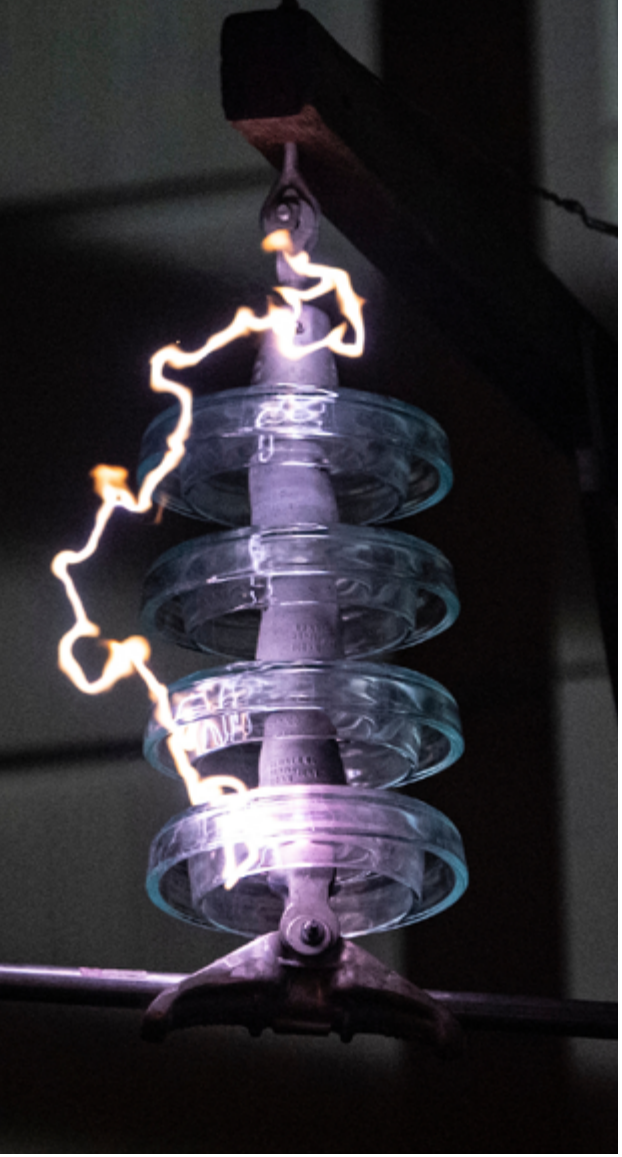

Orion
MISSISSIPPI STATE
UNIVERSITY

CAPABILITIES INDEX

ADVANCED MATERIALS AND MANUFACTURING

AUTONOMOUS SYSTEMS

HUMAN PERFORMANCE & WEARABLE TECHNOLOGY



ARTIFICIAL INTELLIGENCE

CYBERSECURITY

ENERGY & POWER SYSTEMS

IMAGING AND LAB ANALYSIS

FOOD SECURITY

MANUFACTURING SYSTEMS

MODELING AND SIMULATION

EDUCATION AND WORKFORCE DEVELOPMENT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