

GT Georgia Tech.
Research Institute

2025 ANNUAL REPORT

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WELCOME



Tommer Ender,
 Director, Georgia Tech
 Research Institute
 Senior Vice President, Georgia
 Institute of Technology
 (Interim)



Message From the Interim Director

I am proud to present the Georgia Tech Research Institute's (GTRI) 2025 Annual Report, which highlights the remarkable accomplishments of our researchers and mission-support units. Together, they continue to advance GTRI's mission to enhance Georgia's economic development, secure our nation, improve the human condition, and educate future technology leaders. Since stepping into the role of Interim Director in May 2025, I have been focused on positioning GTRI for continued success and preparing for the next director to lead GTRI effectively while serving the broader Georgia Tech community. It is a privilege to guide an organization with such a distinguished legacy and an even brighter future. This past year brought significant changes, including shifts in federal government national security priorities, which remain our primary mission. However, GTRI remains exceptionally well-positioned due to the alignment of our expertise with current federal priorities. These include groundbreaking initiatives supporting the Golden Dome missile defense program, as well as advancements in quantum technologies, artificial intelligence, hypersonics, cybersecurity, space operations, and many other critical areas.

GTRI also remains committed to continuing research in vital categories such as sensors, information, and systems that we have established over the past several decades. In fiscal year (FY) 2025, our dedicated workforce of more than 3,000 staff, research faculty, and students achieved extraordinary milestones. We secured \$964 million in new sponsored contracts, which brings us closer to becoming a \$1 billion organization. None of this success would have been possible without your continued support. Thank you! As Georgia Tech's applied research unit and a Department of Defense/War University Affiliated Research Center (UARC), GTRI is fortunate to leverage the full ingenuity and capability of Georgia Tech. This partnership enables us to develop innovative solutions to address some of the most complex challenges faced by government and industry partners. Thank you for being an integral part of our journey. We look forward to collaborating with you to tackle even greater challenges in FY2026 and beyond. Together, we can continue to make a meaningful impact for the State of Georgia, the nation, and the world.

GTRI Leaders



Tommer Ender
 Director, GTRI
 Senior Vice President,
 Georgia Institute
 of Technology
 (Interim)



Keith McBride
 Chief of Staff



Kenneth Allen
 Deputy Director,
 Chief Technology Officer



Troy Littles
 Deputy Director,
 Chief Operations Officer



Raj Vuchatu
 Deputy Director,
 Chief Information Officer



Mark Militello
 Deputy Director,
 GTRI Finance Officer



Julie Glascock
 Chief Counsel



Erik Andersen
 Deputy Director,
 Electronics, Optics, & Systems
 (Interim)



William Robinson
 Deputy Director,
 Information & Cyber Sciences



Stephen Welby
 Deputy Director,
 Sensors & Intelligent Systems



Michelle Belton
 Senior Director,
 Strategic HR Partners

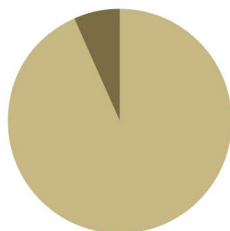
GTRI FY25 FINANCIAL STATEMENT

By the Numbers

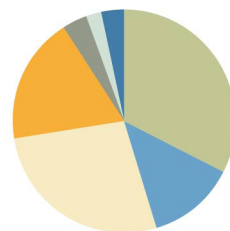
Sponsored Research Awards	\$964M
Revenue Earned	\$988M
Economic Impact to State	\$1.57B
Total Employees	3,099

* Visit report.research.gatech.edu/2025 to see the 2025 Georgia Institute of Technology financial numbers.

Research Breakdown by Sponsor



Research Breakdown by Customer



● Air Force	32.71%
● Army	12.70%
● Other DoD	27.11%
● Navy	18.31%
● Other Non-DoD Federal Agencies	3.88%
● State and Local Governments	2.20%
● Private (Universities, Businesses)	3.08%

- Generating high-paying jobs
- Keeping University System of Georgia graduates in Georgia
- Driving economic growth in Georgia

New “Megaflash” Lightning Record Set; Could Provide Severe Storm Insights

GTRI researchers, in collaboration with the NASA Marshall Space Flight Center and Georgia Tech’s Center for Space Technology and Research (CSTAR), have identified a new record-setting “megaflash” lightning discharge extending 515 miles from near Dallas, Texas, to Kansas City, Missouri. This megaflash, which included over 100 cloud-to-ground strikes, was discovered in satellite data from an October 2017 storm.

Led by GTRI’s Severe Storms Research Center (SSRC), the research into these megaflashes aims to unravel the complexities of lightning and enhance severe storm prediction. The goal is to use these insights to improve forecasting capabilities and provide timely public warnings of lingering lightning dangers even after the main storm front has passed.

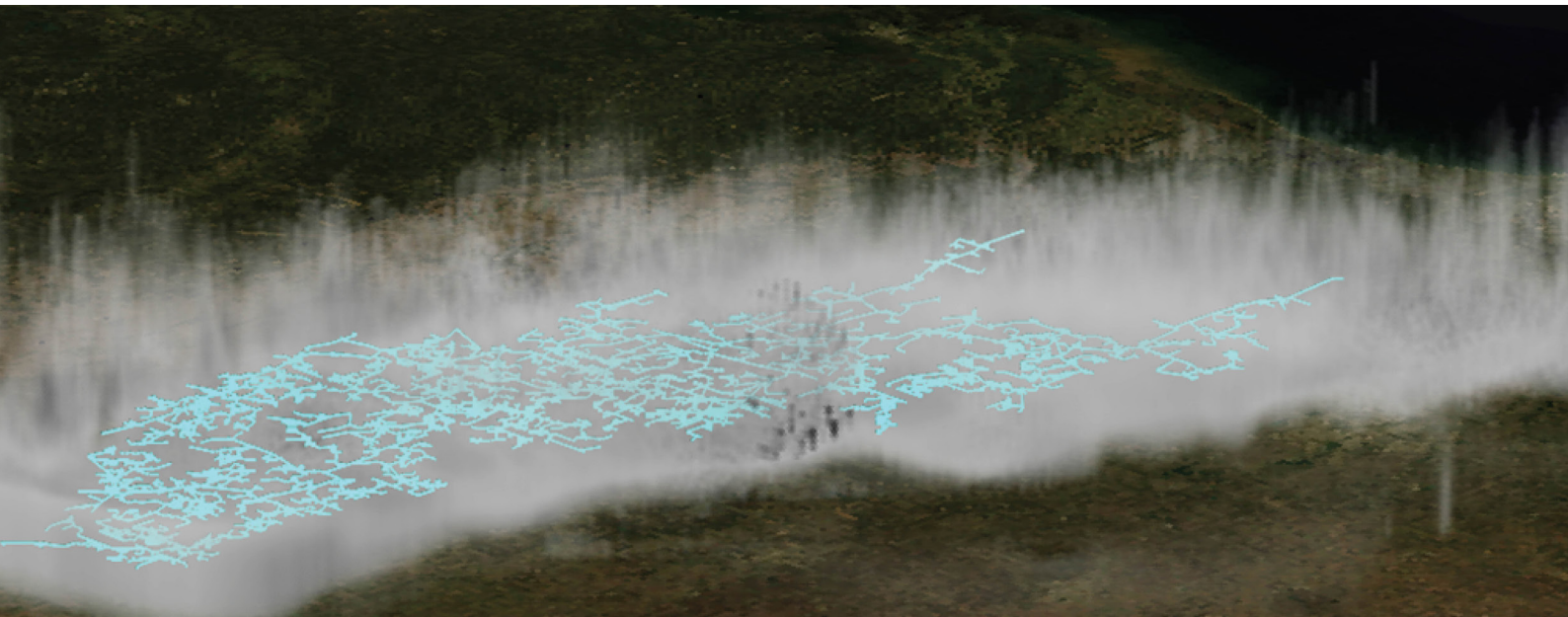
GTRI Develops Climate, Moisture Control Technologies to Optimize Poultry House Operations

GTRI is developing technologies to optimize poultry house operations in Georgia, where poultry has an annual economic impact of over \$28 billion. To address challenges such as changing weather, bird density, and high energy costs, GTRI developed the Broiler House Integrated Guided-Motion Excreta Saturation System (BHIG-MESS) and the “chicken bubble” enclosure.

BHIG-MESS features a tiled floor for automatic manure removal, reducing moisture and ventilation needs, thereby lowering energy consumption. The “chicken bubble” uses an inflatable barrier to minimize air volume requiring conditioning, cutting energy expenses.



During recent trials at the University of Georgia (UGA), GTRI observed that birds on GTRI’s Broiler House Integrated Guided-Motion Excreta Saturation System (BHIG-MESS) flooring system had fewer instances of footpad dermatitis, similar weight patterns, and better overall health in some cases than those on raised traditional wood shavings.



Visualization of a megaflash that extended 515 miles, roughly the distance from Dallas, Texas to Kansas City, Mo. The flash now holds the record as the longest lightning discharge ever recorded.

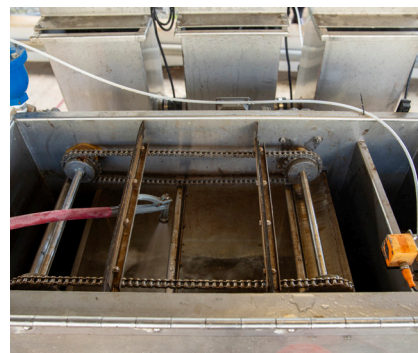
GTRI’s Nanoparticle Technology Enhances Water Purification

GTRI has demonstrated that its innovative nanoparticle technology significantly improves wastewater treatment efficiency and reduces waste, leading to safer discharge or reuse and potential operational cost savings.

In pilot tests at Woodstock’s wastewater treatment plant in Georgia, the technology effectively removed various pollutants and reduced reliance on chemicals and sludge production. GTRI aims to scale up the technology for larger municipal and industrial applications, including in facilities like poultry processing plants and paper mills.



The GTRI team pictured at the Woodstock wastewater treatment plant next to the dissolved air flotation unit it used to test its nanoparticle technology during a recent pilot test.



GTRI’s solution effectively removes pollutants, including suspended solids, organic waste, nitrogen and phosphorous species, while reducing chemical use and the amount of waste produced.

GTRI IMPACTS THE HUMAN CONDITION

Space Station Testing Will Evaluate Photovoltaic Materials

Georgia Tech researchers have sent 18 photovoltaic cells to the International Space Station (ISS) to study their performance under space conditions. The cells, installed in the Multi-purpose International Space Station Experiment (MISSE) Flight Facility, aim to improve solar power efficiency, crucial for space missions.

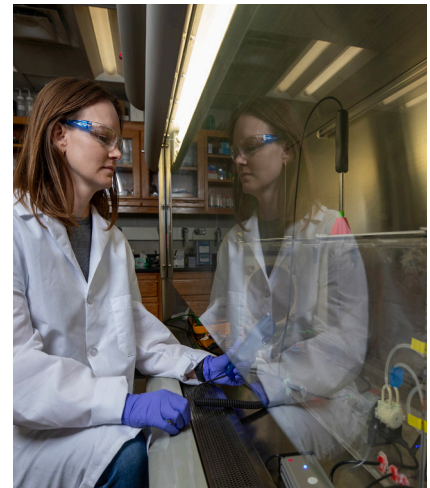
The six-month study will test halide perovskite-based cells, silicon-based devices, III-V materials, and infrared photodetectors, examining their power output, radiation tolerance, and degradation.

MISSE, operated by Aegis Aerospace, will provide real-time data on the cells' space performance, in a mission that underscores the importance of advancing photovoltaic technology for space exploration.

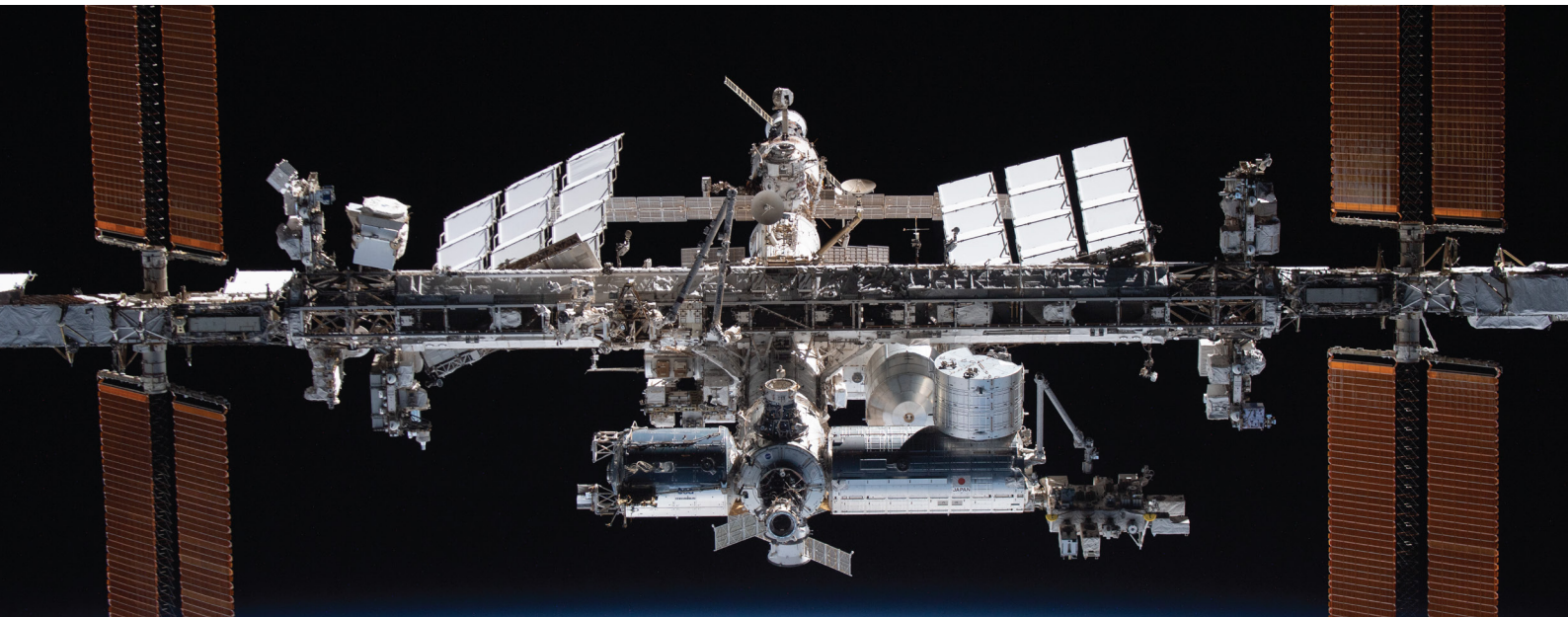
Monitoring Technology Would Detect Airborne Pathogens in Buildings

GTRI, with funding from the CDC, is developing new technologies to detect airborne pathogens in large buildings, focusing on low concentrations of infectious agents often obscured by dust, pollen, and human DNA. The project, part of the Pathogen Genomics Center of Excellence, established in 2022, collaborates with multiple universities in Georgia and the Georgia Department of Public Health.

The GTRI team is creating new methods to concentrate airborne pathogens, making them easier to identify with laboratory techniques. In addition, GTRI is developing a genomics data platform to help public health authorities analyze and share data efficiently.



The project's principal investigator measures particle flow in the bioaerosol containment chamber in simulated tests to demonstrate air flow.



Photovoltaic devices developed at Georgia Tech will be tested on the International Space Station for six months. (Credit: NASA)

Say When: GTRI's SatisfAI Game Helps You Determine How Much AI You Want in Your Life

Would you let artificial intelligence (AI) mow your lawn? File your taxes for you? GTRI researchers have developed SatisfAI, a serious tabletop and digital card game that encourages players to consider how much agency they are willing to share with AI-based systems to solve their real-world problems.

SatisfAI uses a player-judge mechanic to promote both introspection and consideration of the preferences of others, indexing real-world objectives against Max Neef's

model of fundamental human needs, and asks players to indicate their preferred level of autonomy, from choices such as "No AI," "Assistant," and "Surrogate."

The game has received enthusiastic feedback from K-12 teachers across Georgia and expansion plans are underway.



In SatisfAI, players take turns as the judge, deciding how much AI involvement they prefer in real-world scenarios, while others predict their choice to earn points.

Adaptive Phased Array Antenna Supports Hypersonic Flight Testing

GTRI has collaborated with U.S. defense contractor AV to develop an Advanced Phased Array Antenna Technology (APAT) system to capture telemetry signals during hypersonic flight tests over the Pacific Ocean.

This innovative system uses Radio Frequency System on Chip (RFSoc) technology to process signals directly on antenna elements, enabling the simultaneous tracking of multiple signals.

Funded by the Pentagon's Test Resource Management Center (TRMC), APAT combines commercial components with custom elements, creating one of GTRI's most advanced all-digital antenna systems.

Wearables Help Move Cognitive Workload Studies to the Field

Despite the expanding capabilities and increasing sophistication of automation, human operators still play vital roles in today's military systems.

As the complexity of these systems continues to grow, so does the importance of understanding how humans interact with these technologies.

GTRI scientists are using wearable instrumentation to study human performance indicators such as electrical activity and oxygenation of the brain, heart rate, respiration, eye movements, and facial expressions to understand how operators respond to stressful conditions while interacting with military systems.



A research scientist adjusts sensors on a colleague seated in a helicopter seat atop a three-axis motion platform set up to simulate turbulence.



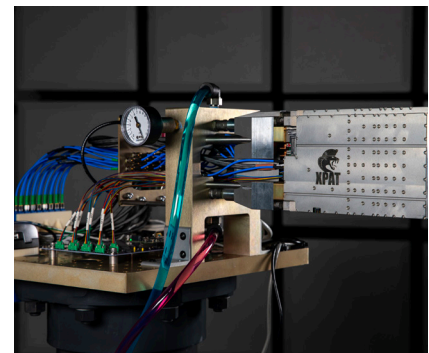
In a GTRI facility, researchers prepare to test a subarray designed for use in the APAT project.

GTRI Develops New Polarization-Diverse X-Band AESA Testbed

Active electronically scanned array (AESA) radars are playing increasingly critical roles today, protecting warfighters and civilians as part of air and missile defense systems. They are also critical tools on modern test and training ranges, allowing aircrews to train against realistic simulations of real-world threats.

To accelerate modernization of these systems, GTRI researchers have developed a novel, fully-integrated compact X-band polarization-diverse AESA testbed known as XPAT.

The system was developed for operation in airborne and ground-based AESA applications that require a reconfigurable software-defined radio frequency (RF) aperture to meet a variety of requirements and mission sets.



An XPAT subarray shown under test in GTRI's planar near-field range.

GTRI IMPACTS TECHNOLOGY LEADERS

Research with Impact: How GTRI's Military Graduate Program Develops Mission-Ready Leaders

Through its Military Graduate Research Program (MGRP), GTRI is providing military personnel with the opportunity to conduct part-time, Department of Defense/War-related research in GTRI labs while earning a STEM master's degree from Georgia Tech.

This year's cohort consisted of nine officers from the U.S. Air Force, Navy, and Space Force who worked on projects ranging from using machine learning for military runway damage assessment to deploying nuclear power units for disaster relief.

This initiative strengthens GTRI's bond with the military and highlights its commitment to advancing defense technologies.

74 Georgia High School Students Gain STEM Experience in 2025 Summer Internship

GTRI's K-12 outreach program STEM@GTRI hosted 74 high school students from 16 Georgia school districts for its 2025 summer internship program. The students were selected from an application pool of 1,104.

Students gained real-world STEM experience, working on projects ranging from developing a device to protect runners from dog bites, assessing and mitigating security risks in Large Language Models and creating a "smart" trash can to count all items used during surgery to ensure patient safety.

Forty-six GTRI professionals representing six labs and one support units served as mentors to the interns.



2025 STEM@GTRI high school student internship presentations.



Members of GTRI's latest MGRP cohort said the program has equipped them with critical thinking, strategic planning, and problem-solving skills essential for the next phase of their careers.

GTRI's Hives Program Empowers Emerging Leaders to Tackle Future Challenges

GTRI is empowering junior researchers through its Hives Early Career Independent Research and Development (IRAD) Program.

Funded by GTRI's IRAD program, Hives allows researchers within their first six years of employment as well as tenure-track assistant professors at Georgia Tech to lead innovative projects on emerging technologies and security topics with significant national and global impacts.



GTRI researchers reflect on their experiences with Hives, noting that the program has sharpened their technical acumen and prepared them to manage higher-stakes projects at GTRI.

GTRI ACCELERATES GROWTH THROUGH STRATEGIC ALIGNMENT AND LEADERSHIP EXCELLENCE

2025 has been a pivotal year for GTRI, marked by key leadership hires, continued advancements in research and innovation, and strong growth in sponsored contracts that reflect sponsors' confidence in GTRI's alignment with evolving national security needs.

This past year has been marked by sizable changes, including evolving priorities within the federal government that have influenced GTRI's largest sponsor, the Department of Defense/War. Despite these shifts, GTRI remains strongly positioned to address national challenges thanks to the alignment of our expertise with pressing federal needs.

These include GTRI's pioneering efforts in areas such as advanced quantum technologies, including the development of new ion traps to support next-generation quantum computing and innovative ion cooling techniques to simplify quantum systems; artificial intelligence applications like AI for electronic warfare (EW), AI for logistics optimization, and research exploring trust and human-centered design in AI adoption; cybersecurity tools, such as a novel technology that protect U.S. electric utilities from cyber threats and a deep commitment to expanding access to cyber education across Georgia, the nation and world; as well as space operations, including the development of photovoltaic materials to power future space applications and a physics-informed machine learning approach to enhance satellite operations analysis.

Kenneth W. Allen, Ph.D., was appointed Chief Technology Officer, where he provides strategic leadership for GTRI's \$25 million independent research and development (IRAD) portfolio and oversees its technology strategy. Allen has driven innovation for the Department of Defense/War and intelligence community through advanced materials, measurement science, and radar technologies.

Julie Glascott, a distinguished legal practitioner and military leader with over 21 years of expertise in national security law, litigation, and government procurement, joined as Chief Counsel. Leveraging her extensive experience, she supports GTRI's mission to strengthen national security and address critical global challenges through technological innovation and research.

These leaders are joined by other notable appointments, as well as key leadership roles across research and operations.

GTRI continues to build on its longstanding excellence in core areas like sensors, information, and system technologies, ensuring our research remains both innovative and impactful. With a strong foundation of mission-critical solutions aligned to sponsor priorities, GTRI is ready to meet new challenges head-on by delivering cutting-edge solutions to customers' toughest problems.

New Appointments

Stephen Welby
Deputy Director,
Sensors & Intelligent Systems

Gary Ashworth
Director,
GTRI Washington Operations

Kenneth Allen, Ph.D.
Deputy Director,
Chief Technology Officer

Julie Glascott
Chief Counsel

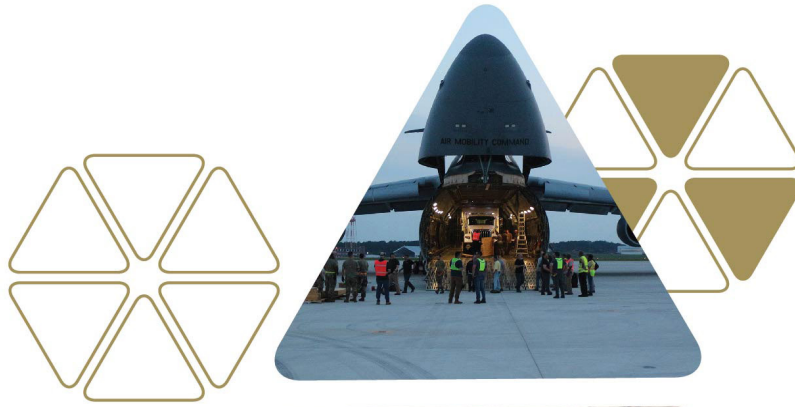


GTRI also welcomed several key leadership appointments that have further strengthened its mission excellence and strategic direction.

Stephen Welby, joined as Deputy Director for Research, leading the Sensors and Intelligent Systems Directorate. With decades of experience in senior roles at the White House, the Defense Advanced Research Projects Agency (DARPA), and the Pentagon, Welby brings exceptional expertise to drive innovation, foster collaboration across sectors, and address national security challenges.

Gary Ashworth, former Acting Secretary of the U.S. Air Force, joined as Director of Washington Operations. Ashworth's extensive knowledge of defense acquisition, sustainment, and technology strategy is enhancing GTRI's partnerships with federal agencies in the nation's capital.





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