ANNUAL REPORT 2025

SOUTHWEST RESEARCH INSTITUTE®

ARTIFICIAL INTELLIGENCE

As artificial intelligence (AI) proliferates across the full range of human experience, Southwest Research Institute (SwRI®) is leveraging its computer and data science expertise to navigate the opportunities and challenges associated with its use, particularly with Large Language Models (LLMs). SwRI is advancing responsible AI to make complex workflows faster and more intuitive. Through an Internal Research and Development initiative, SwRI developed a framework for applying LLMs to real-world systems, including a prototype that lets transportation system operators use natural language to perform multi-step tasks. Instead of navigating multiple screens or commands, staff can ask a question and get results instantly, boosting productivity while maintaining oversight and accountability in AI-driven tools.

▶ Using advances made through an internal research initiative, SwRI is developing an electronic warfare LLM to autonomously generate mission data files (MDFs) that optimize stealth flight paths, identify and classify threats, and execute countermeasures. Traditionally, aircraft MDFs required the expertise of a human subject matter expert.

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◀ SwRI advanced a markerless motion capture technology to capture human movement to create 3D animations for gaming, training and entertainment applications. The Biomechanical Evaluation and Animation Motion Capture — BEAMoCap™ — tool converts video (left) into realistic 3D animations (right) without the conventional marker suits worn by actors.

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▲ As part of SwRI's LLM initiative, analysts integrated a chatbot into its Intelligent Transportation System technologies to evaluate how natural language can simplify complex workflows and improve operational productivity.

▶ SwRI developed the Generative Approaches for Molecular Encodings (GAMES) LLM to understand and generate Simplified Molecular Input Line Entry System (SMILES) strings. These strings represent the structure of molecules using a short series of text characters. These facilitate storage, retrieval and modeling, particularly for SwRI's Rhodium™ drug development software, shown here.

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ABOUT THE COVER

For maritime and other large-structure applications, SwRI developed a learning-based weld planning system to allow robots to intelligently weld steel ship components. The framework integrates insights from conventional simulation technology with real-world variations identified during assembly. Engineers then configured the setup and operation of a robotic welding application to optimize metal component assembly while mitigating distortion and stress. This solution produces structures with improved performance and service life while reducing post-assembly milling or machining rework of welds.

FROM THE PRESIDENT

122173

2025 was another outstanding year for Southwest Research Institute, and this Annual Report highlights several of SwRI's accomplishments in science, engineering and technology. This report also spotlights many of our internal research and development programs, awards and accolades, community engagement activities and financial milestones that were part of our success in 2025. Whether landing an SwRI instrument on the Moon for the first time or expanding our expertise in developing life-saving pharmaceuticals and biologics, SwRI continues providing solutions for some of humankind's most difficult technical challenges.

In March, the SwRI-led Polarimeter to Unify the Corona and Heliosphere (PUNCH) mission was launched to deploy four small satellites into a polar Earth orbit. These SwRI-built satellites make 3D observations of the Sun's corona and visualize space weather events, such as coronal mass ejections, as they travel through the inner solar system. PUNCH data will help advance our understanding of the relationship between the corona and the solar wind that moves throughout our solar system.

August brought the grand opening of our new Warner Robins, Georgia, facility — the first SwRI-owned property outside of Texas. This facility will help advance electronic warfare and defense technologies for the U.S. Air Force. Back on our San Antonio campus, the new Center for Accelerating Materials and Processes (CAMP) facility opened in September. CAMP will support research and development for tomorrow's high-speed aerospace engines.

In November, SwRI received two R&D 100 Awards as co-developers of both an oil-free compressor and a high-efficiency engine. The R&D 100 Awards recognize the 100 most significant international innovations each year and are often referred to as the "Oscars of Innovation."

2025 also included many changing priorities in both government and commercial markets. SwRI's technical breadth and depth allowed us to quickly adapt to most of these changes and provided new opportunities for growth in emerging technical areas. We continue making investments in our staff, infrastructure and business development practices, which will open new areas of innovation and complement existing programs.

In 2025, we also celebrated the 40th anniversary of SwRI's Internal Research and Development (IR&D) Program with a poster exhibit and symposium. For four decades, IR&D has played a vital role in SwRI's success, laying the groundwork for significant developments in practically every technical area. This robust program will help us build the skills and knowledge needed for ongoing success in 2026.

Despite the dynamic R&D environment of 2025, SwRI achieved another record-breaking year for revenue. We also received worldwide recognition for our commitment to the United Way. SwRI staff continue to live out our core values of integrity, innovation, people and stewardship, driving the success of our organization and giving back to our community.

In 2025, SwRI celebrated 78 years of solving many of humankind's most difficult technical challenges, from Deep Sea to Deep Space®, and practically everywhere in between. As we embark on a new year, we will continue to thrive as one of the nation's leading independent research and development organizations — inspired by the principles and values that have guided SwRI's success. Please read on to learn more about some of the notable accomplishments in 2025. And thank you for your continued interest, input and support.

Adam L. Hamilton, P.E.
President & CEO

IR&D

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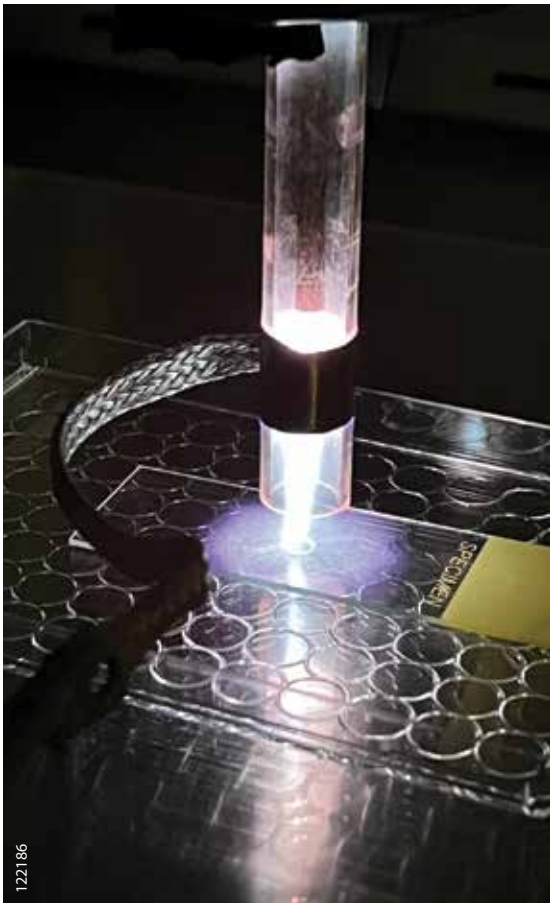
▶ To help meet global demands for sustainable food production, SwRI scientists used internal funding to study how plasma mutagenesis can improve microbial fermentation to enhance tolerance, enzyme activity and production traits in microbial species. Using a lactic acid bacterium widely used in dairy and fermented foods, we explored how to promote mutations that enhance fructose utilization to improve flavor, reduce costs and expand plasma mutagenesis as a food manufacturing tool.

◀ SwRI developed a learning-based framework that integrates residual stress insights from physics-based simulations with real-world assembly variations to optimize welding of large structures. The resulting robotic system increases the service life and performance, while reducing post-fabrication rework, of large structures such as ships.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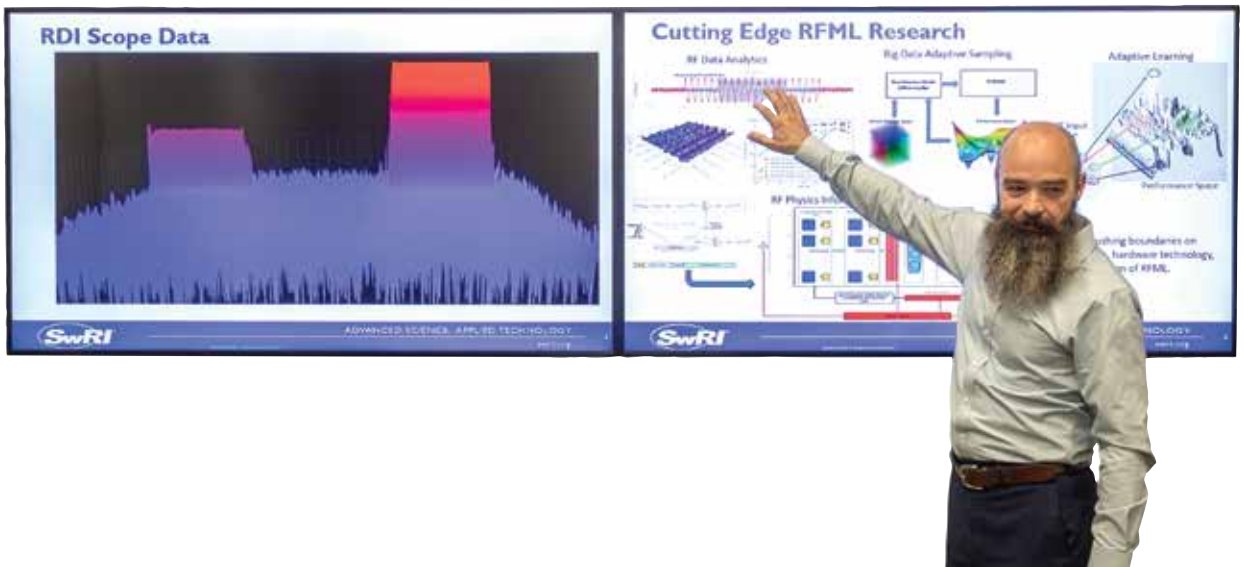
As a nonprofit research and development organization, SwRI invests in innovation, using our robust internal research and development (IR&D) program to expand and enhance our expertise and encourage our staff's professional growth. In 2025, SwRI initiated 140 new IR&D projects, investing more than $13 million in internal research, a record number of new projects and record monetary investment. These included a marked increase in targeted internal projects designed to prove concepts for potential client programs and to assist with our business development efforts. IR&D fulfills SwRI's objective of conducting innovative research and development for the benefit of industry, the government and humankind.

Through internal research, we increase our technical capabilities, expand our reputation as a leader in science and technology, and invest in research positioning SwRI to address our clients' future needs. The program also allows engineers and scientists to grow in their technical fields by providing freedom to explore innovative and unproven concepts without contractual restrictions and expectations. IR&D is frequently cited as a key enabling factor leading to new projects, new clients and completely new research arenas within SwRI.



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◀ SwRI trained complex cognitive electronic warfare (EW) algorithms to help Air Force systems discern between friendly and adversarial data signatures as seen in the image on the left.

MILESTONES 2025

The first SwRI-owned facility outside San Antonio opened in Warner Robins, Georgia, bolstering our longstanding support for the U.S. Air Force. The 33,000-square-foot building is strategically located 3 miles from Robins Air Force Base.

AWARDS

Dr. Robin Canup: 2025 Dirk Brouwer Career Award from the American Astronomical Society's Division on Dynamical Astronomy

Walt Downing: IEEE Members and Geographic Activities Leadership Award

Jonathan Esquivel: National Association of Broadcasters Technology Innovation Award

Finley Hicks: Association of Old Crows Technology Hall of Fame Award

Yong-Li McFarland: ASTM International Award of Excellence for service on Committee D02 on Petroleum Products, Liquid Fuels and Lubricants

Dr. James Walker: Distinguished Scientist Award from the Hypervelocity Impact Society

One of SwRI's two 2025 R&D 100 Awards recognized this low-mass, high-efficiency engine, developed in collaboration with the U.S. Department of Energy and General Motors. SwRI supported the multiyear development of the engine using advanced materials and combustion technology to achieve a 10% increase in fuel economy and a 15% weight reduction when compared to conventional engines.

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R&D 100 Awards recognized R&D World Magazine's 100 most significant innovations for 2025.

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IMAGE COURTESY COPELAND

376 PAPERS PUBLISHED

PODCASTS **21**

58 WEBINARS

PRESENTATIONS GIVEN **507**

36 OTHER MEDIA

The "Copeland oil-free centrifugal compressor with Aero-lift™ bearing technology" is a frictionless, oil-free compressor designed to cool large industrial locations, such as data centers and health care facilities. Developed with Copeland, the technology cools industrial spaces and large facilities while eliminating the traditional costs associated with oil maintenance and expensive magnetic bearings.

HONORS

Dr. Adam Cawood: selected a Distinguished Lecturer for the American Association of Petroleum Geologists

Dr. Sidney Chocron: elected Fellow of the International Ballistics Science Society

Dr. Steven Dellenback: International Program Chair for ITS America

Dr. Christopher Glein: selected to present the American Geophysical Union's Carl Sagan Lecture

Dr. Danna Qasim: named Planetary Science Member-At-Large for the American Astronomical Society Laboratory Astrophysics Division

Angel Wileman: Honoree in the Women in Hydrogen 50 for 2025 List

PATENTS & INVENTIONS

26 U.S. PATENTS AWARDED

U.S. PATENT APPLICATIONS FILED **29**

42 INVENTION DISCLOSURES SUBMITTED

3,200 EMPLOYEES 2,176 DEGREES

333 DOCTORATES

620 MASTERS

1,014 BACHELORS

209 ASSOCIATES

SwRI's 33,505-square-foot Center for Accelerating Materials and Processes (CAMP), which was completed in 2025, will use advanced equipment to conduct research and development to support tomorrow's high-speed aerospace engines. Initial projects will explore how advances in additive manufacturing (AM) technology can drive down production costs and enable new designs for high-speed propulsion systems. This powerful computed tomography (CT) scanner helps SwRI engineers identify flaws in AM-produced parts.

AUTOMOTIVE & TRANSPORTATION

Southwest Research Institute's engines, fuels and lubricants research, development and evaluation services have been refined, improved and expanded since the Institute's earliest days. As leaders in automotive and transportation initiatives, SwRI staff members are well versed in low-carbon technologies as well as traditional internal combustion engines. This breadth of expertise positions SwRI to meet the needs of its diverse client base, while continuing to upgrade its technology and testing capabilities to meet current and future industry demands. SwRI also brings technology solutions to mobility challenges in the intelligent transportation arena.

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AUTOMOTIVE

SwRI pioneers research, development and evaluation options for aftertreatment system technologies, helping the automotive industry meet and exceed emissions and fuel efficiency standards. Many of today's diesel engines use selective catalytic reduction (SCR), an advanced emissions control system, to abate oxides of nitrogen (NOx) emissions. Diesel exhaust fluids (DEFs) — mixtures of urea, water and additives — are injected into the exhaust stream, to ideally decompose and form ammonia to react with NOx on the SCR materials to form nitrogen and water.

Currently, new automotive fluids must undergo strict "no-harm" testing to ensure that these products do not have negative effects on engine performance or hardware. SwRI is developing new DEF testing methods for advanced aftertreatment systems. As the only organization in the country that conducts this research, SwRI is providing input to the American Petroleum Institute to update standards designed to test and qualify DEFs.

In addition, SwRI has licensed its R&D 100 Award-winning catalyzed DEF, or Cat-DEF™, to reduce NOx and carbon dioxide emissions while minimizing undesirable deposit formation in exhaust systems. The licensing agreement allows a manufacturer to develop products using patented SwRI DEF technology, which incorporates catalysts and surfactants into diesel exhaust fluid to improve performance. Cat-DEF is backward compatible with existing engines, reducing deposit formation by 90%. The product could allow diesel engine manufacturers to pass stringent testing without expensive engine hardware modifications.

SwRI also has extensive experience providing performance and abuse testing for batteries, cells and packs as well as

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▲ SwRI has licensed its R&D 100 Award-winning Cat-DEF technology to reduce NOx and carbon dioxide emissions while also minimizing undesirable deposit formation in exhaust systems, as tested on the simulated system above.

▼ SwRI will soon manage a client-installed grid storage installation on our campus to support design, development, production, testing and innovation for the energy sector.

119490

◀ For over 40 years, SwRI has conducted extensive fuel surveys, procuring and analyzing thousands of samples from filling stations around the world.

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▲ SwRI provides battery production and design services that integrate and complement our longstanding performance and abuse testing of batteries, cells and packs as well as grid-scale energy storage systems.

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▶ As global emissions standards become more stringent, SwRI continues to offer robust, professional and extensive capabilities to ensure engines, fuels and lubricants meet criteria.

grid-scale energy storage systems. We are now applying that expertise to provide battery pack production and design services. SwRI's battery testing and research team will work with clients to design and create custom battery packs to meet special needs and ensure performance. Our facilities in Ann Arbor, Michigan, serve as a leading benchmarking facility for electric vehicles.

Grid-scale storage can involve large-scale battery systems to store energy and balance supply and demand, and Texas has the second largest grid installation base in the country. SwRI is preparing to manage a client-installed grid storage system on our campus to support this burgeoning industry. This commercial collaboration allows SwRI to better understand battery-electric storage system software controls and operating cycles. This opportunity will provide enabling expertise to design, develop, produce and test innovative technology for the grid sector. SwRI is currently pursuing research to develop its own unique battery system software.

SwRI's emissions testing continues to advance and will be particularly relevant as the international industry expects stricter standards that will affect testing, particularly for NOx emissions. As emissions standards become more stringent around the world, SwRI remains well-positioned to provide robust, professional and extensive emissions evaluation capabilities to ensure compliance. In addition, most U.S. engine manufacturers will need to produce engines able to meet standards for the international market, so the parts, electronics, fuels and lubricants for those engines will continue to need testing.

SwRI is collaborating with The University of Texas at San Antonio to create technology to detect and identify pre-ignition in hydrogen internal combustion engines (H_2-ICE). Researchers will combine machine learning algorithms and artificial intelligence with onboard sensors to detect pre-ignition and related conditions. SwRI has been spearheading efforts to develop H_2-ICE for industry use through its many consortia, such as Clean Highly Efficient Decarbonized Engines (CHEDE). These efforts have led to advancements in systems research and other successes, such as SwRI's fully functional H_2-ICE class 8 truck.

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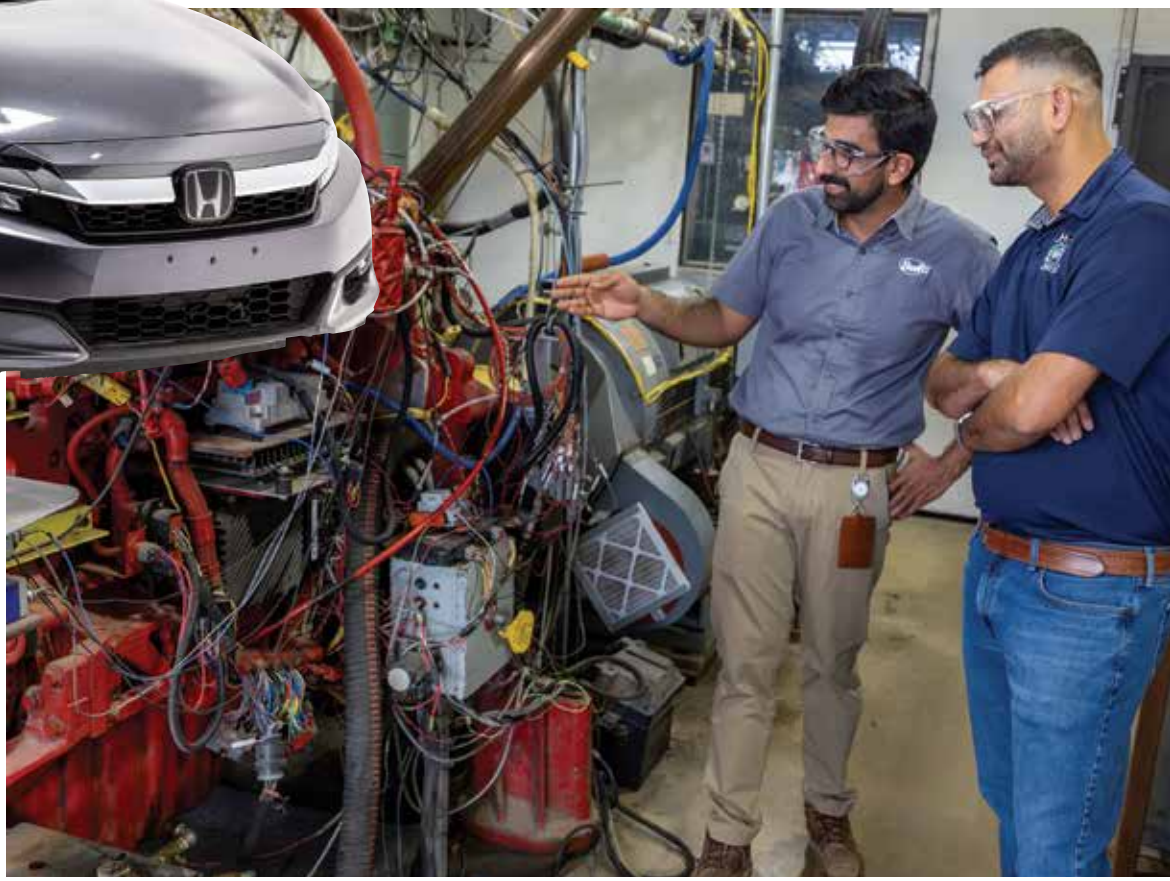
▲ In 2025, SwRI successfully completed an eight-year project that demonstrated how connected and automated vehicle technology and SAE Level 4 automation could accomplish 30% energy savings over traditional hybrids, without modifications to the powertrain hardware.



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▼ SwRI is collaborating with the University of Texas at San Antonio to create a detection system to identify pre-ignition in hydrogen internal combustion engines, such as this heavy-duty engine that SwRI demonstrated last year.

SwRI successfully completed an ambitious eight-year project that demonstrated how connected and automated vehicle technology and SAE Level 4 automation could accomplish 30% energy savings over traditional hybrids, without modifications to the powertrain hardware. The Advanced Research Projects Agency–Energy's (ARPA-E) NEXTCAR (NEXT-Generation Energy Technologies for Connected and Automated On-Road Vehicles) program funded the research. SwRI showcased its technology at the NEXTCAR program's capstone event at the American Center for Mobility in Michigan in June. The award-winning "Eco-Mobility with Connected Powertrains" technology suite and Phase II developments are now available to license. The project's team now looks toward adapting and innovating the algorithms for automotive and other technology, including drones, aviation and more.

An engine co-developed by SwRI recently won a 2025 R&D 100 Award. The "Low Mass and High Efficiency Engine for Medium-Duty Truck Applications" was recognized by R&D World Magazine as one of the year's 100 most significant innovations. SwRI supported the multiyear development of a medium-duty truck engine capable of yielding a 10% increase in fuel economy and a 15% weight reduction using advanced materials and combustion technologies. The project was funded by the U.S. Department of Energy Vehicle Technology Office and led by General Motors.

SwRI is preparing new heavy-duty engine oil specification tests in response to the U.S. Environmental Protection Agency's 2027 emissions rules, currently known as Proposed Category 12 or PC-12. These oils are designed to have lower viscosity and better thermal resistance to improve fuel economy globally. We are helping manufacturers ensure that the new low-viscosity formulations avoid excessive engine component wear associated with inadequate lubrication. SwRI is developing new standardized test specifications, adapting and enhancing existing tests while developing innovative hardware to use less fuel to lower development and evaluation costs.

SwRI has developed a new test for pre-ignition in internal combustion engines, focusing on how fuel affects pre-ignition. This uncontrolled combustion in an engine is associated with several variables. Similar tests exist to examine lubricant effects; however, engine manufacturers are interested in the different

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▲ ▶ Upgrades to AC dynamometers used to simulate fleet testing now recover power for SwRI's grid instead of sending waste heat to cooling towers that consume water, saving SwRI thousands of dollars a year in electricity.

▼ SwRI staff members support Shell Eco-Marathons around the world, providing assistance and expertise for the student competitors and helping conduct technical and engineering inspections of their ultra-high-efficiency vehicles.

122197

ways fuels might contribute to the phenomenon to help prevent it.

SwRI operates 24 "road simulators," conducting rapid, cost-effective, round-the-clock mileage accumulation at speeds up to 100 miles per hour. These chassis dynamometers accommodate most cars and light trucks up to 7,000 pounds, conducting any transient or steady-state driving cycle. One of our dynamometers offers four-wheel-drive capabilities and supports hybrid vehicle testing under real-world conditions. Four newly installed dynamometers have temperature- and humidity-controlled engine inlet air to ensure consistent operating conditions year-round. An additional high-performance dynamometer supports vehicles up to 400 horsepower.

Recent upgrades to AC dynamometers also reduced our carbon footprint by generating power for SwRI's grid instead of sending waste heat to cooling towers that consume water. Three dynamometers, which often run 24/7 for days on end to support automotive testing services, now produce enough energy to save SwRI thousands of dollars a year. A fourth system will go online next year.

In 2025, SwRI supported Shell Eco-Marathon events worldwide in Indianapolis, Poland and Qatar. These annual events invite high school and university student teams from across the globe to design, build and race ultra-high-efficiency vehicles at famous racetracks. For nearly 15 years, SwRI has supported the Shell Eco-Marathon, which included sponsoring the Off-Track Award for Technical Innovation. Each year, our staff provide assistance and expertise for the student competitors and helps conduct technical and engineering inspections.

TRANSPORTATION

For more than 30 years, SwRI has been a premier provider of intelligent transportation systems (ITS) and advanced traffic management systems (ATMS) for state and local agencies. These networks integrate infrastructure, technology and software with

vehicles to communicate with the traveling public. SwRI's ITS technology is deployed across several states, serving more than 25% of the United States population to enhance safety and mobility.

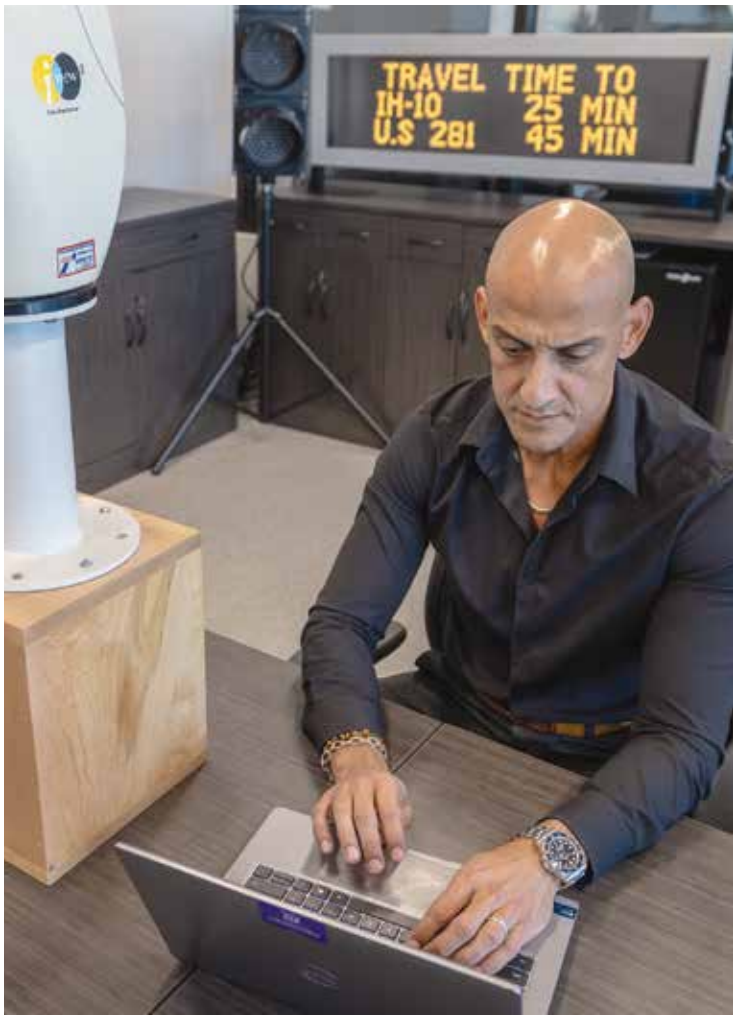
An SwRI-led team is developing and deploying the Data Exchange Platform for Operational Technologies (DEPOT) for the Florida Department of Transportation (FDOT). This cutting-edge system enhances statewide data collection, analysis and dissemination capabilities, to create a fully integrated solution that prioritizes mobility and safety. The system will enable FDOT to disseminate connected and automated vehicle information to the automobile industry, logistics providers and other third parties to consume for their specific applications.

Over the last three years, SwRI has developed a production version of the DEPOT system for Pennsylvania to inform motorists about work zone closures and impacts. Other states working to integrate DEPOT include New Hampshire, Vermont, Maine, Georgia and California as well as the North Central Texas Council of Governments.

District 2 of FDOT is the first agency to implement SwRI's Active-Vision™ camera analytics system. This technology uses machine vision and learning to pinpoint critical incidents like wrong-way drivers and traffic accidents across 18 counties in Northeastern Florida.

We customized, installed and launched SwRI's ActiveITS™ ATMS for the city of Seattle. The resulting traffic operation center enhances situational awareness, traffic signal integration and seamless data sharing between the center and emergency services, key partners and the Washington State Department of Transportation.

In 2025, SwRI also integrated a traffic prediction modeling tool in Virginia. By incorporating AI and data-driven insights, this system empowers traffic engineers to more effectively manage traffic incidents and congestion.



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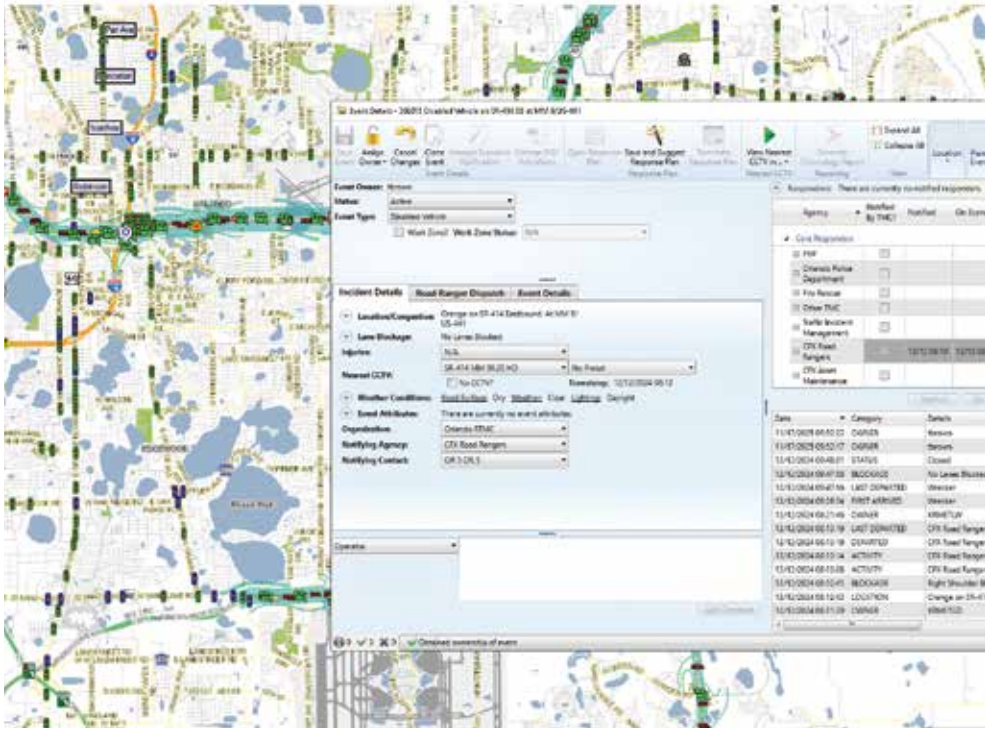
◀ SwRI has developed an ITS showcase laboratory allowing engineers to test and demonstrate software for transportation infrastructure, signs and cameras before roadway deployment.



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▼ SwRI customized its ActiveITS system in Seattle for our first deployment at a city level — most ITS solutions are managed by state agencies. Here, the user interface shows road equipment deployments and a sample incident.

Southwest Research Institute's defense and intelligence advancements bring progress and innovation to the front lines with an emphasis on accuracy, efficiency, security and safety. We continue to expand capabilities that produce reliable results for military and defense clients. SwRI-developed technology supports U.S. and allied forces, helping achieve military objectives and advancing solutions to support and protect warfighters. Our defense and intelligence engineers tackle today's toughest aerospace, antenna, communications, software and signals challenges to advance tomorrow's technology. SwRI also supports government and industry with cybersecurity services spanning homeland security and commercial enterprises.

DEFENSE & SECURITY

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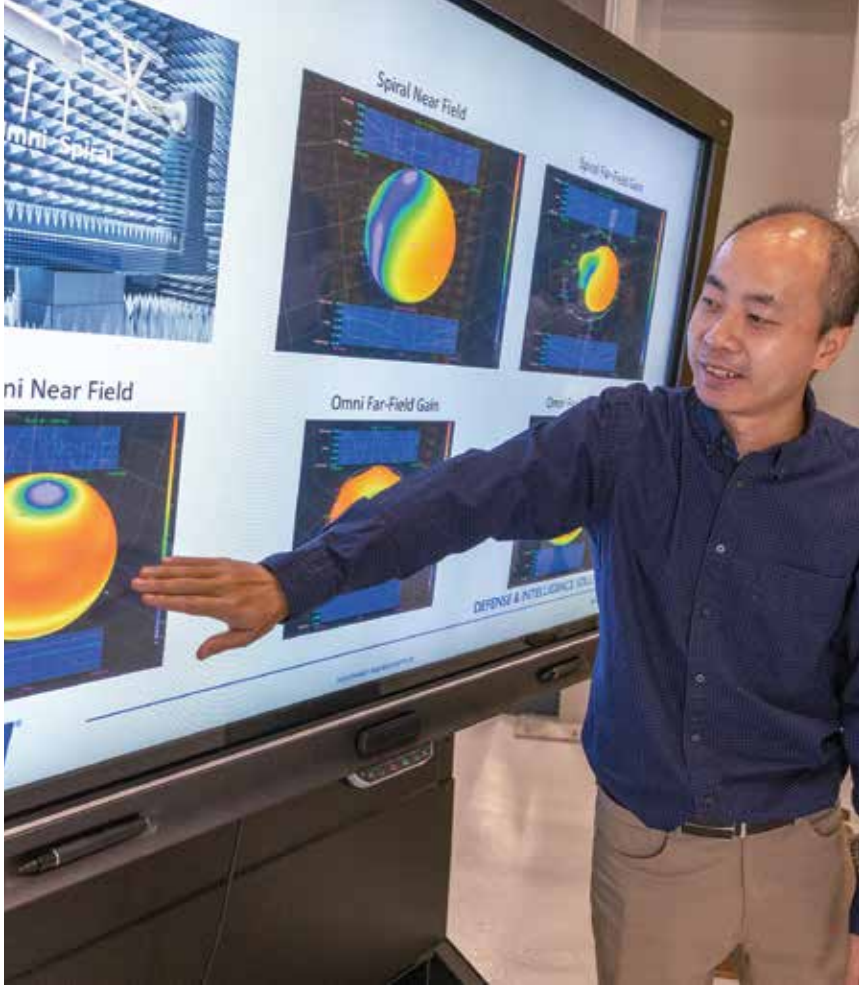

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▲ SwRI's new spherical near-field antenna test chamber accurately samples the near field of an antenna, which engineers can then mathematically transform into far-field data. Analyzing both fields provides more complete performance evaluations.

▶ SwRI installed a private, secure, high-velocity 5G network to support a range of research and development projects. This antenna extends the 5G coverage range, which will ultimately support next-generation 6G research.

◀ SwRI performs structural integrity assessments, usage monitoring, materials characterization, component and full-scale testing, and stress and damage tolerance analyses to sustain aging aircraft such as the A-10 Thunderbolt II attack airframe shown here.

SwRI developed specialized sensors and trained algorithms to advance cognitive and neuromorphic capabilities in electronic warfare (EW) systems designed to thwart enemy attacks on military targets. Cognitive EW integrates elements of human perception, using AI algorithms to autonomously sense the environment and determine threats around an aircraft or vehicle. These systems independently decide an appropriate response, making adjustments in real time to improve performance. SwRI systems use spiking neural networks to emulate how the human brain retains memories, making processing faster, more accurate and more efficient.

Through an internal research initiative, SwRI is developing an EW large language model (LLM) to autonomously generate mission data files (MDFs) that optimize stealth flight paths, identify and classify threats, and execute countermeasures. Traditionally, aircraft MDFs required the expertise of a human subject matter expert (SME) familiar with myriad radar modes and specialized EW terms. Leveraging the fine-tuning capabilities of a leading open-source platform, SwRI trains LLMs using synthetic data mirroring current and legacy radar systems while incorporating a range of formats, including text and tables. The data extraction process is context-driven, ensuring alignment across sources, with the goal of generating EW MDFs autonomously. Refining LLM precision and information comprehension streamlines the generation of mission data, reducing reliance on human SMEs and increasing operational efficiency.

Using automatic speech recognition models, SwRI computer scientists are developing methods to transcribe collected communications signals for faster, easier analysis. This technique reduces operator workload, increases audio transcription, improves accuracy and enables new features like keyword matches. Researchers are fine-tuning the model using distorted signal data, including fading noise, impulse noise and varying signal-to-noise ratios. The model has been integrated into SwRI's Frontier system, a signal evaluation tool. SwRI is considering expanding the speech recognition tool by adding language and speaker identification to improve model performance.

SwRI developed and deployed a high-performance, high-frequency direction-finding (DF) system to allow users to discover new or elusive signals of interest using arrival direction as a filtering criterion. The radio frequency spectrum between 3 and 30 megahertz is congested with signals that can propagate for thousands of miles. SwRI's newly deployed process, Full Spectrum DF, significantly accelerates DF processing to more than 33 million calculations per second. The large volume of calculations allows angle-of-arrival measurements on

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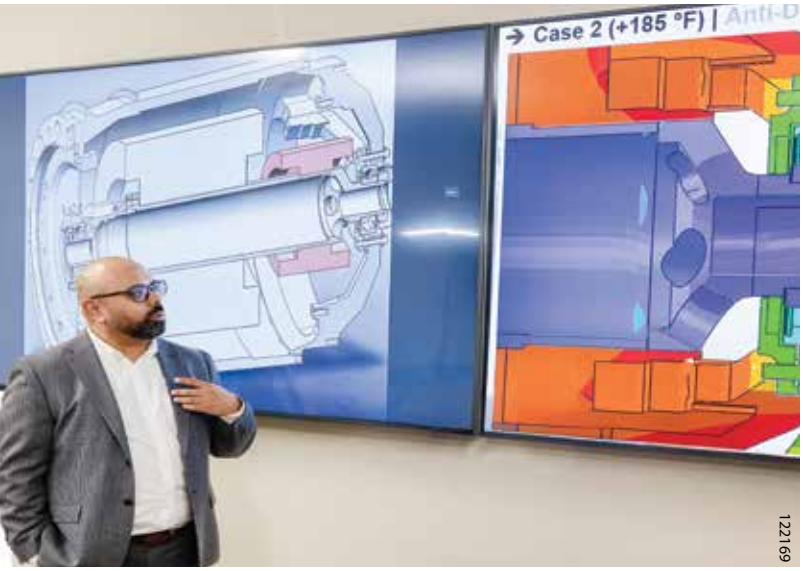

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▲ SwRI developed software that allows a robot to use multiple arms working together to meet the challenges associated with intricate, high-stakes, or bulky material handling applications, such as munitions loading.

◀ For the Air Force, SwRI created a first-of-its-kind digital twin of the B-52 AC generator to uncover the root cause of catastrophic bearing failures. Multicolored patterns emerging under various temperatures and stressors contributed to the findings.

◀ SwRI developed algorithms for event cameras, digital imagers that record pixel changes within a field of view, to track small, fast and agile uncrewed aerial systems (UASs). These counter-UAS technologies support airspace security.

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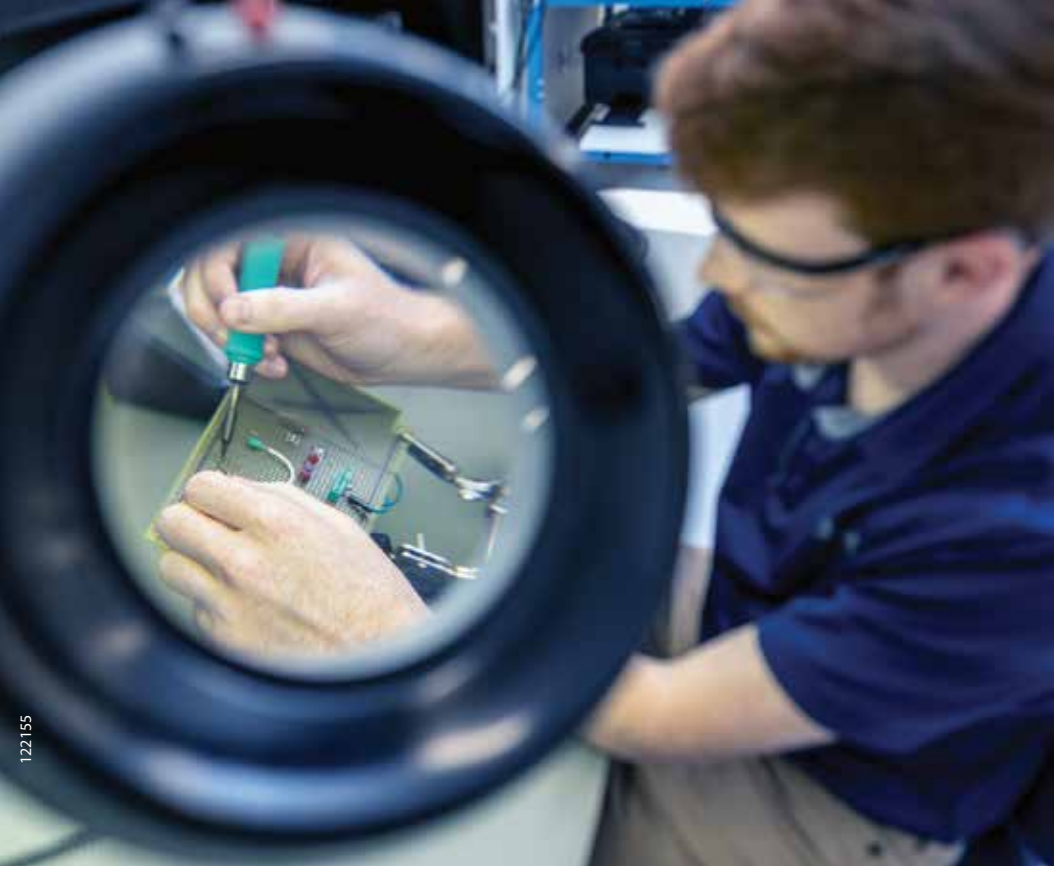
very short signals and signals in a crowded spectrum, providing more precise information about the location of a signal's source.

Turning forensic engineering into mission assurance, SwRI uncovered the root cause of multiple B-52 alternating current generator failures that caused catastrophic outcomes in the field, including near-crashes. Engineers captured 3D scans at micrometer levels to assess the geometry of key generator parts, bearing components and rotor inertial properties. Subtle wear patterns and misalignments emerged under digital scrutiny. Using scanning electron microscopy imaging and X-ray diffraction, SwRI investigators discovered microcracks, pitting and degraded lubrication pathways — previously undetected signs of fatigue and contamination.

For decades, SwRI has worked with the Air Force to extend the life of aging military aircraft. This year, we received new contracts to sustain the A-10 Thunderbolt II attack aircraft, the T-38 Talon supersonic trainer, the C-5 cargo carrier and the B-52 Stratofortress bomber, among others. These fleets were introduced between the 1950s and 1970s. SwRI will also provide technical engineering support for smaller fleets managed by Hill Air Force Base, including the T-41 and T-52 trainers and the E-9 surveillance aircraft.

SwRI invested in the Air Force community of Warner Robins, Georgia, to advance national defense technology, with the first SwRI-owned property outside of Texas. After decades of leasing there, SwRI opened a 33,000-square-foot, $18.5 million building strategically located 3 miles from Robins Air Force Base. The new facility features conference rooms, offices, labs and equipment to support development of EW technologies that detect and intercept enemy radar signals. Engineers use the facility's server equipment to train highly complex AI algorithms locally, eliminating the lengthy process of copying data sets between our San Antonio headquarters and Warner Robins.

In 2025, SwRI developed software to help the U.S. Department of Defense identify and respond to chemical and



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▲ SwRI engineers develop testing technology to evaluate advanced electronic warfare systems designed to thwart enemy attacks on military aircraft.

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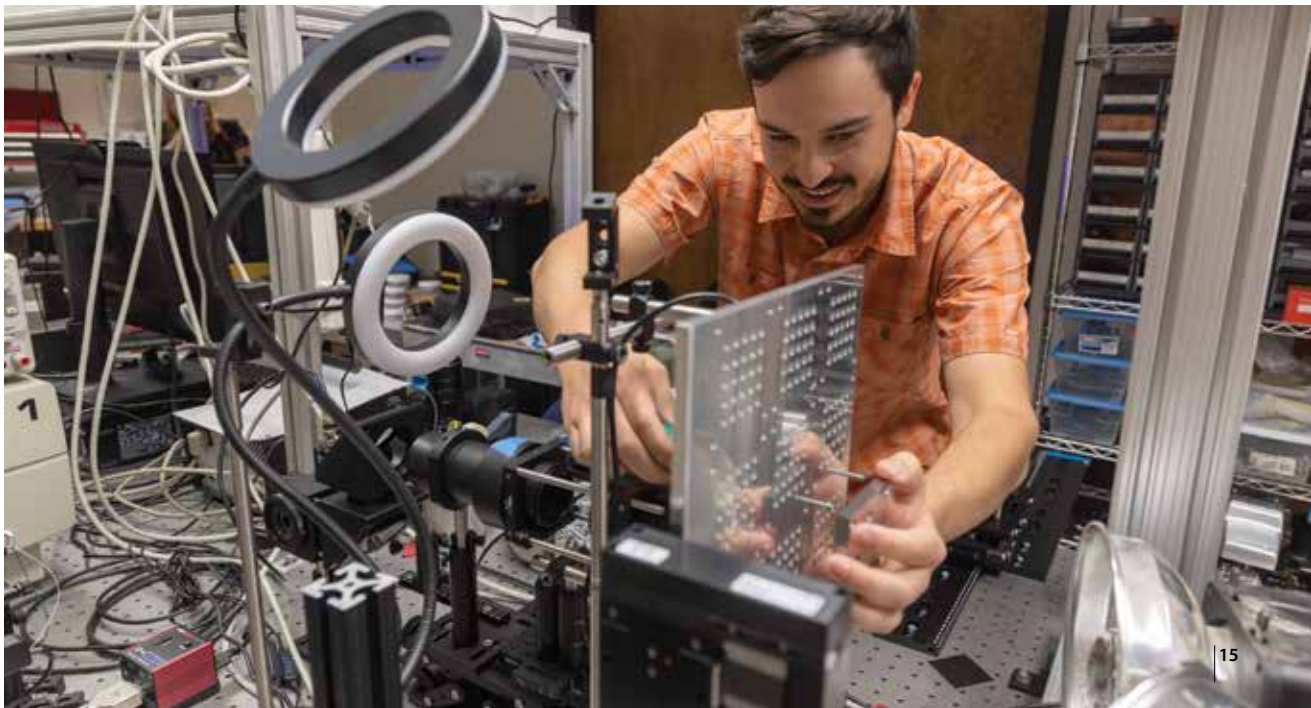
▶ SwRI developed a high-frequency direction-finding system that significantly accelerates calculations for very short signals and signals in a crowded spectrum, providing more precise information about the location of a signal's source.



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▶ SwRI expanded the scope of LIPIT, dramatically enhancing precision and efficiency by engineering test systems to launch larger projectiles, 0.3 millimeters in size. The new automated system can perform 200 ballistics tests per hour.

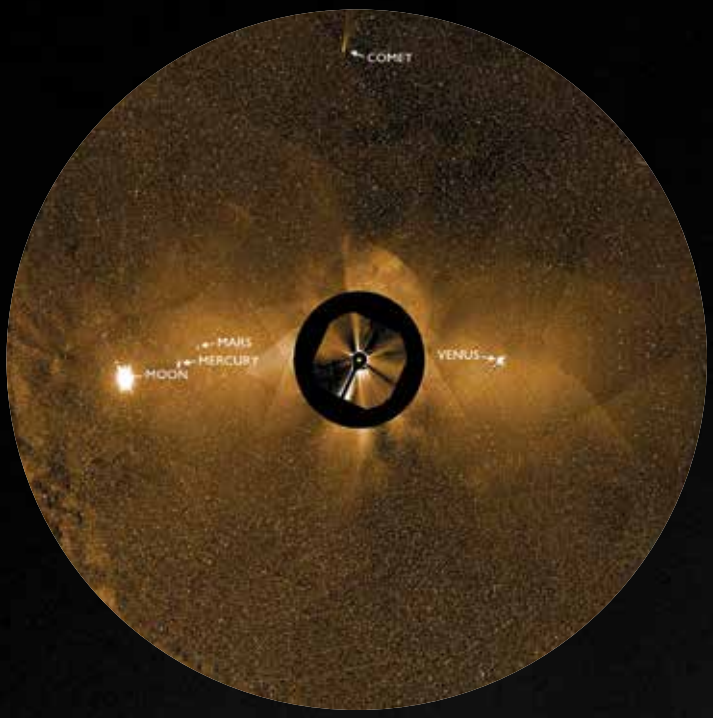
biological threats. The tool helps make agile medical decisions about countermeasures and other actions to rapidly address a danger or threat.

In 2025, SwRI expanded the scope of the Laser-Induced Particle Impact Test (LIPIT), dramatically increasing the precision and efficiency of material ballistic resistance testing at scales not possible before. Previously, LIPIT only supported testing using extremely small projectiles. To make LIPIT results more applicable to full-scale ballistics, SwRI engineered a test system to launch larger projectiles of 0.3 millimeters in size. Further, the system was automated to accelerate from a manual test rate of 30 to 40 tests per day to the automated rate of 200 tests per hour.

In 2025, cybersecurity work included penetration testing, risk assessment and secure software development for critical systems. In 2025, SwRI's team identified cybersecurity vulnerabilities in both 240-volt Level 2 electric vehicle (EV) chargers and direct current fast chargers (DCFC). As a result of the Level 2 work, the EV charger manufacturer published a public advisory for 76 impacted products, and the Cybersecurity and Infrastructure Security Agency issued two common vulnerability and exposure (CVE) reports. The DCFC research uncovered a critical cybersecurity risk with global implications, leading to another CVE report.

EARTH & SPACE

Southwest Research Institute is home to one of the nation's leading space science and engineering programs, conducting fundamental and applied research and developing innovative technology for commercial companies and government agencies worldwide. SwRI's strong Earth science expertise complements our space research.



▶ Four SwRI-built PUNCH spacecraft launched in March 2025 to image in exquisite detail the birth of the solar wind and how it evolves as it streams through the inner solar system.

◀ Since launch, the SwRI-led PUNCH mission has been refining images of the Sun in context while tracking comets, enormous space weather events, the Moon and planets.

IMAGES COURTESY SPACEX 122221

122182

◀ Three spacecraft designed to monitor and map the heliosphere and the solar wind that defines it launched in September. SwRI played key roles in both NASA's IMAP mission, the primary spacecraft on top, and SWFO-L1, the NOAA satellite on the right.

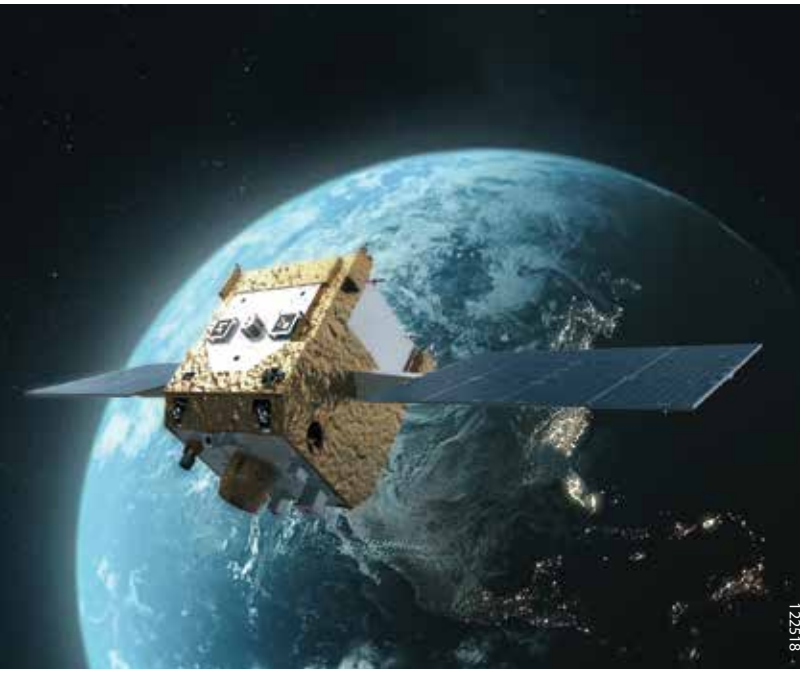
In fiscal year 2025, SwRI supported five launches with spacecraft, instruments, testing and other expertise. In October 2024, two SwRI-developed instruments launched aboard NASA's Europa Clipper to help understand the potential habitability of Jupiter's moon Europa. The Ultraviolet Spectrograph (Europa-UVS) is the sixth in a family of instruments designed to look at the composition and chemistry of Europa while the novel MAss Spectrometer for Planetary EXploration (MASPEX) is designed to sample the moon's atmosphere with unprecedented precision.

On March 2, the first SwRI instrument to land on Earth's Moon touched down aboard the Firefly Aerospace's Blue Ghost 1 lander. The SwRI-led Lunar Magnetotelluric Sounder (LMS) was activated and deployed its five sensors to study the Moon's interior by measuring electric and magnetic fields. The LMS instrument was the first extraterrestrial application of magnetotellurics, which uses natural variations in surface electric and magnetic fields to calculate how easily electricity flows in subsurface materials, revealing their composition and structure.

On March 11, four small satellites designed and built by SwRI launched into a polar orbit to act as a single virtual instrument 8,000 miles across. The SwRI-led Polarimeter to Unify the Corona and Heliosphere (PUNCH) mission collects widefield, 3D movies of the entire inner solar system. Three of these spacecraft include SwRI-developed Wide Field Imagers that have already captured coronal mass ejections as they erupted from the Sun and traveled across the inner solar system. The fourth spacecraft has a Narrow Field Imager that allows scientists to see details of the Sun's atmosphere by blocking out its bright face. State-of-the-art processing on the ground removes the background starfield, over 99% of the light in each image, to reveal the extremely faint glimmer of the solar wind.

NASA's Tandem Reconnection and Cusp Electrodynamics Reconnaissance Satellites (TRACERS) mission launched in July. SwRI provided comprehensive mission management and science to the University of Iowa and developed the Analyzer for Cusp Ions (ACI) instruments, which study interactions between the Earth's and Sun's magnetic fields. In addition to managing the development of the two satellite bus platforms and supporting instrument integration and testing, SwRI is supporting science operations post-launch.

On Sept. 24, 2025, NASA launched two spacecraft loaded with SwRI technology designed to better understand and map the Sun's influence across the solar system. The National Oceanic and Atmospheric Administration's (NOAA) Space Weather Follow-On Lagrange 1 (SWFO-L1) satellite shared a ride to space with the primary payload, NASA's Interstellar Mapping and Acceleration



122518

▲ SwRI engineers are developing the Astroscale U.S. Refueler illustrated here. This demonstration spacecraft is designed to refuel compatible satellites in orbit.

122162

▼ SwRI is building QuickSounder, the first of a new generation of NOAA low-Earth orbit environmental satellites, which will deliver 95% of collected data within 30 minutes to significantly improve weather forecasting.

IMAGE COURTESY ASTROSCALE U.S.

Probe (IMAP) mission. SwRI played a key role in IMAP, managing the payload office as well as providing critical technology and the SwRI-developed Compact Dual Ion Composition Experiment (CoDICE) instrument. The SwRI-built Solar Wind Plasma Sensor (SWiPS) and SWFO Magnetometer (SWFO-MAG) are two of four instruments integrated into SWFO-L1, NOAA's first satellite designed specifically for continuous, operational space weather observations.

Also in 2025, a new lunar payload called DIMPLE — Dating an Irregular Mare Patch with a Lunar Explorer — passed its preliminary design review. The instrument will probe a lunar volcano named Ina that appears to be geologically recent, despite the current view that lunar volcanism ended billions of years ago. DIMPLE will determine the geologic context and age of Ina using cameras and a novel SwRI-developed laser-spectroscopy instrument called the Chemistry Organic and Dating Experiment or CODEX.

Additional instruments under development include another magnetometer and two custom space weather coronagraphs for upcoming NOAA satellites. SwRI is also developing NASA's Joint EUV (Extreme Ultraviolet) coronal Diagnostic Investigation, or JEDI, for ESA's Vigil space weather mission to study underlying mechanisms of the Sun's activity. In preparation for a 2026 launch, an SwRI team is integrating two instruments into the CubeSat Imaging X-ray Solar Spectrometer for NASA's Heliophysics Flight Opportunities in Research and Technology program.

SwRI is building three spacecraft in the 74,000-square-foot Space System Spacecraft and Payload Processing Facility — created to respond to customers needing to rapidly design, assemble and test spacecraft, particularly small satellites. QuickSounder is the first of a new generation of NOAA low-Earth orbit environmental satellites. The SwRI-designed and -built satellite will characterize the physical properties of Earth's atmosphere that heavily influence global weather patterns.

Engineers are also building, integrating and testing two servicing spacecraft for Astroscale U.S. The Life Extension in Orbit (LEXI) spacecraft is designed to extend the life of in-orbit client satellites by docking with them and performing propulsive maneuvers intended to either return them to service or move them to a disposal orbit beyond crowded geostationary orbit. The Astroscale U.S. Satellite Refueler, funded by the U.S. Space Force, is designed to dock with and refuel client vehicles or accept fuel from on-orbit tankers in geostationary orbit.

To support these programs, SwRI developed and patented its Parallelogram Synchronized Truss Assembly (PaSTA), which stiffens deployable structures on spacecraft, such as solar arrays, enabling safe and autonomous spacecraft rendezvous and docking operations. SwRI is deploying PaSTA technology in the solar arrays for both the refueler and LEXI spacecraft.

This year, SwRI staff delivered exquisite astronomical hardware designed to observe the universe with unparalleled sensitivity. The Spectrograph and Camera for Observations of Rapid Phenomena in

IMAGE COURTESY NASA/GODDARD/SWRI/JOHNS HOPKINS APL/NOIRLAB

122187

▶ The SwRI-led Lucy mission flew past asteroid Donaldjohanson on April 20, 2025, capturing this image from approximately 660 miles (1,100 km) away, before continuing its journey to the Jupiter system for the first encounters with eight Trojan asteroids.

122152

▼ Engineers are integrating SwRI-developed Parallelogram Synchronized Truss Assembly (PaSTA) technology into solar arrays on two spacecraft, giving them the stability needed for maneuvering in outer space.

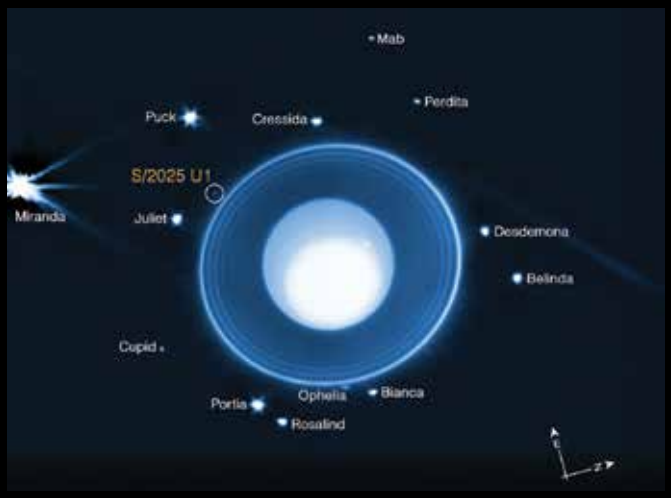
the Infrared and Optical (SCORPIO) is a powerful eight-channel imager and spectrograph for the Gemini Telescope in Chile. For the last year, SCORPIO has been in Madrid, Spain, for optics integration and alignment and will ship to Chile in 2026 to complete verification and final integration into the telescope to start observing the stars.

NASA's Lucy spacecraft flew past main belt asteroid Donaldjohanson on April 20, successfully collecting data about the object that formed about 155 million years ago when a larger parent asteroid broke apart. Scheduled to visit a total of 11 asteroids during its 12-year mission, the SwRI-led Lucy mission used this second asteroid encounter, following the Dinkinesh-Selam system visited in 2023, as the spacecraft's final dress rehearsal before reaching the Jupiter system for encounters with eight Trojan asteroids starting in 2027.

In 2025, the SwRI-led PUNCH and Lucy missions also observed interstellar comet 3I/ATLAS, only the third interstellar object scientists have discovered traveling through our solar system. From 240 million miles away, Lucy's high-resolution panchromatic black-and-white imager captured photos of the comet in September, as the comet approached Mars. Then in late Fall, PUNCH had an exclusive view of the interstellar interloper when it was too close to the Sun for other telescopes or spacecraft to observe.

SwRI scientists have earned coveted time on the James Webb Space Telescope (JWST), making new discoveries about the most distant reaches of the solar system and beyond. Using observations from this premier space telescope, an SwRI-led team discovered a previously unknown moon orbiting Uranus, which is by far the smallest satellite to date, bringing the planet's total moon count to 29. Other JWST studies detected carbon dioxide and hydrogen peroxide on the frozen surface of Pluto's largest moon Charon and discovered methane gas on the distant dwarf planet Makemake, the only such object with a confirmed presence of gas. SwRI compared JWST spectroscopy data from asteroid Polana with laboratory data from samples returned from asteroids Bennu and Ryugu

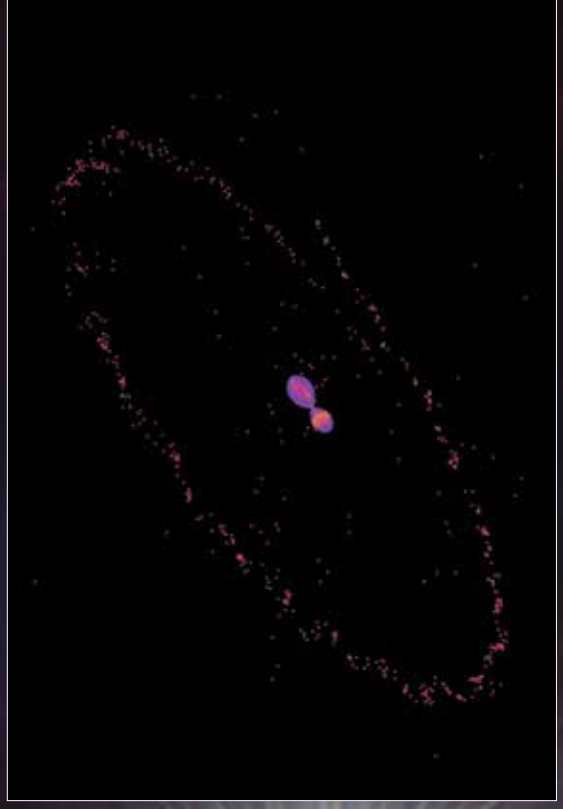
IMAGE COURTESY NASA/ESA/CSA/STSCI/SWRI/UNIVERSITY OF IDAHO



122203

◀ SwRI led a James Webb Space Telescope survey that discovered a previously unknown moon (circled) orbiting Uranus between its satellites Bianca and Ophelia, shown along with 13 of the other 28 known moons orbiting the planet.

▶ SwRI staff members assembled a powerful eight-channel imager for the Gemini Telescope in Chile, which, once completed and installed, will offer unique, unprecedented views of the universe.



122206

▶ SwRI's advanced modeling indicates that the formation of Pluto and Charon may parallel that of the Earth-Moon system. In the resulting "kiss-and-capture" regime, Pluto and Charon collide and initially stick together before separating into a stable orbit.

◀ Using four sensors and a magnetometer (shown deployed above right), the first instrument SwRI has landed on the Moon collected data to allow scientists to characterize the lunar subsurface from aboard the Blue Ghost lander.

IMAGE COURTESY FIREFLY 122201

122202

◀ SwRI is developing a new lab to replicate nebular cloud conditions that led to the formation of stars like our Sun, to help understand new JWST and other observations.

to posit that all could have originated from the same parent asteroid in the main belt between Mars and Jupiter.

SwRI modeled the chemistry of an exoplanet between Earth and Neptune in size, finding evidence that it's a rocky planet with a thick, hot atmosphere. Models show that the planet is likely too hot to be habitable but could serve as an archetype to understand a relatively common class of exoplanets distinctly different from anything found in our solar system.

From its location at the edge of the solar system, the SwRI-led New Horizons observed Lyman-alpha emissions to create the first map of our galaxy in this ultraviolet wavelength, shedding light on nearby galactic structures and processes. The SwRI-developed ultraviolet spectrograph onboard New Horizons collected data to help astronomers assess the composition, temperature and movement of distant stars and galaxies.

An SwRI study underway in frozen sand dunes in Alaska is applying the constraints affecting life in these harsh environments to understand the habitability of other worlds. The nutrient-poor sand dunes freeze annually at their surface and offer little to no moisture, conditions considered analogous to dune fields on Mars or one of Saturn's moons.

Also in 2025, SwRI engineers designed and tested space fluid systems for multiple commercial space and aerospace vehicles. Liquid propellants exhibit unique behaviors in accelerated low-gravity environments, challenges that must be managed for successful flight. SwRI performed slosh and baffle design analyses for three vehicles to help mitigate mechanical issues and ensure proper control. We also designed propellant management devices for a lunar lander and a hypersonic aircraft.

Working with the University of Texas at San Antonio, SwRI will flight-test novel technology designed to improve the production of propellants and life-support resources on the Moon and Mars. UT-San Antonio designed the electrolyzer to use local resources to create necessities, such as oxygen and fuels, to support long-term human habitation on these worlds. SwRI engineers are integrating the electrolyzer into an SwRI-built flight rig to test its performance in low gravity on a series of parabolic flights.

122174

IMAGE COURTESY ZERO-G

◀ To support future crewed and robotic Moon missions, SwRI tested a penetrator probe in reduced-gravity conditions aboard a parabolic flight, maturing sensor hardware that will aid in exploration activities on the lunar surface.

120869

▶ SwRI developed this Planetary Laboratory for Novel Environments Testing and eXperiments (Planet-X) facility to evaluate space hardware at temperatures from -200 to 200 Celsius, in high vacuum, using a high-resolution gas analyzer and other sensors.

ENERGY & ENVIRONMENT

Since its founding in 1947, Southwest Research Institute has supported the energy industry in a wide range of capacities. In 2025, the program remained active in developing sustainable industrial processes while also advancing conventional energy technology. SwRI continues to support safety for the nuclear power, oil and gas production, and solar energy industries.

122149

◀ SwRI developed a fluidized bed pilot plant that can produce 2.3 tons of clean hydrogen a year. Operating at commercial temperatures, chemists are identifying solutions for solids transport and tackling challenges related to scale-up and product quality.

▶ SwRI developed processes designed to produce clean energy and value-added carbon products from natural gas. Using novel pyrolysis techniques, chemists converted methane into hydrogen and solid carbon co-products such as graphite.

▼ Peak shaving facilities stabilize energy supplies and pricing during periods of high demand by storing LNG in massive cryogenic tanks during periods of low usage. SwRI is evaluating how the potential introduction of hydrogen into these systems could affect safety.

A new 90,000-square-foot Machinery Innovation Center for High-Energy Fluids is under construction at SwRI. It will facilitate megawatt-scale testing of machinery such as gas turbines, turbo compressors, reciprocating compressors, industrial heat pumps and many other systems that use these hydrocarbons and other flammable gases in power generation or conversion applications. It will also allow researchers to evaluate a range of hydrocarbon machinery for efficiency, safety and durability.

Surging use of artificial intelligence applications is exponentially increasing demands for high-speed computing that produce massive amounts of heat. This is driving dramatic increases in the demand for high-capacity heat exchangers that efficiently transfer heat between two or more fluids without mixing — used for a wide variety of heating and cooling applications. To meet burgeoning demands, SwRI is expanding its heat exchanger testing capabilities to include megawatt-scale performance evaluations, a capability matched by only a handful of facilities worldwide. Customizable testing facilities support a wide range of heat exchangers — from 500 kilowatts up to 2.75 megawatts in its current configuration, with the potential to exceed 5 megawatts — to help the industry establish a performance baseline for data centers.

Using IR&D funding, chemical engineers developed a lab-scale process to convert carbon dioxide (CO_2) captured from industrial waste into graphene. With a wide range of uses from biomedical devices to sensors and electronics, graphene is both versatile and valuable. SwRI performed technoeconomic analyses to demonstrate the scalability of using a continuously stirred tank reactor to convert CO_2 into graphene.

In 2025, SwRI engineers also demonstrated multiple pilot-scale conversion processes designed to produce clean energy and value-added carbon products from natural gas. This effort included the construction, commissioning and operation of several first-of-their-kind pyrolysis demonstration plants that convert methane into hydrogen and solid carbon co-products such as graphite, carbon nanotubes and carbon black. SwRI chemical engineers advanced the field by developing the largest single-reactor process in the U.S. to produce carbon nanotubes at scale.

To support decarbonization efforts set by the aviation industry, chemical engineers performed internal research to produce sustainable aviation fuels (SAF) from electrofuels, or E-fuels, made from CO_2 and hydrogen. A multidisciplinary team at SwRI then characterized the SAF to ensure it met all required specifications before combusting it in a custom jet engine test stand to gather emissions and particulate data. Chemical engineers also worked with clients to develop a process for converting fats, oils and greases into SAF precursors using new and existing fluidized

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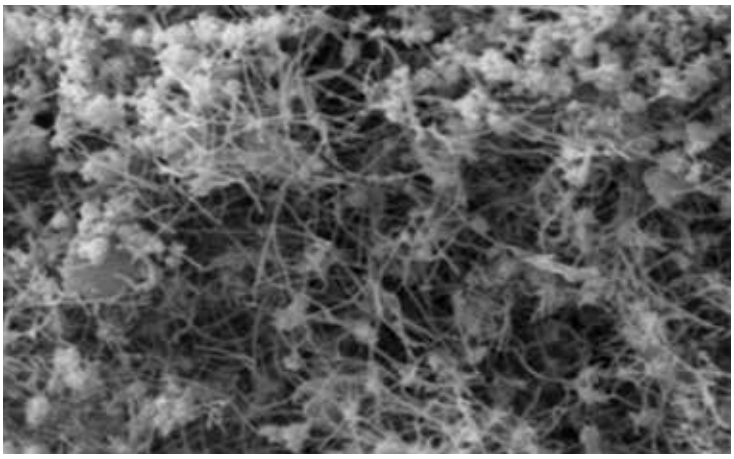

122181

and fixed bed reactors. These processes could help the aviation industry achieve its goal of exclusive SAF use by 2050.

SwRI has developed a fluidized bed pilot plant that can produce 2.3 tons of clean hydrogen a year. The facility demonstrated circulating and bubbling bed capabilities that ran continuously for thousands of hours. Operating at commercial conditions, SwRI is identifying solutions for solids transport and tackling challenges related to scale-up and product quality. These advancements will help support the chemical and petroleum industries and address feasibility issues surrounding clean hydrogen and carbon capture.

Power cycles that use supercritical carbon dioxide (sCO_2) as the working fluid have the potential to yield higher thermal efficiencies at lower capital costs. SwRI conducts materials and machinery research to support these new power cycles. This year, engineers set new temperature records for testing materials in high-pressure environments. The team evaluated high-pressure, high-temperature sCO_2 turbine materials at the unprecedented conditions of 1,150 degrees Celsius (2,100 degrees Fahrenheit) at 300 bar (4,350 psi). These are the highest published temperature and pressure conditions ever reached in sCO_2 materials testing.

SwRI is investigating challenges associated with introducing renewable natural gas (RNG), a sustainable energy source. Transporting RNG, particularly from landfill sources, via the natural gas distribution network can introduce trace chemicals typically not found in geologic natural gas. SwRI has generated scientific test data to help inform operations and

▲ In 2025, SwRI chemists demonstrated multiple pilot-scale conversion processes designed to produce clean energy and value-added carbon products from natural gas, such as these carbon nanotubes shown under an electron scanning microscope.

◀ SwRI evaluated flame spread between photovoltaic solar panels and roof materials, presenting the results at the National Fire Protection Association Conference. A second round of testing starts in early 2026.

▶ To meet surging demands for high-capacity heat exchangers, SwRI expanded our testing capabilities to address a significant market gap for equipment providing high-heat transfer rates involving high-temperature and -flowrate applications.


122158

regulations pertaining to allowable levels of mercury in natural gas distribution systems as RNG is brought into the gas supply, ensuring that RNG is safe, reliable and properly regulated.

In collaboration with NYSEARCH, a nonprofit research and development organization for the gas industry serving utility members across North America, SwRI is investigating how blending hydrogen into liquid natural gas (LNG) could affect the integrity of LNG storage tanks. Natural gas is widely used to power appliances and heat homes. By blending hydrogen into these existing natural gas streams, utilities can reduce the carbon footprint of energy delivery while leveraging current natural gas infrastructure.

The Center for Nuclear Waste Regulatory Analyses (CNWRA®) continues to support the U.S. Nuclear Regulatory Commission (NRC) with expertise and research. The CNWRA performs technical and regulatory analyses to address the challenges of storing, transporting, processing, recycling and disposing of spent nuclear fuels. To support this work, the CNWRA organized a three-day international forum focused on research, technical and regulatory considerations to manage spent fuels for advanced nuclear reactors. In 2025, the CNWRA supported the license application review for proposed advanced nuclear power reactor sites in Wyoming and Texas, including analyzing the seismic hazards and structural engineering of proposed sites. Additionally, CNWRA conducted research to support updates to the NRC's regulatory review process for spent advanced nuclear fuels.

In support of the Finnish Radiation and Nuclear Safety Authority, CNWRA staff evaluated the Safety Case for the Operating License Application for a deep geologic repository for spent nuclear fuel, currently under construction next to the Olkiluoto Nuclear Power Plant.

Also in 2025, SwRI performed a series of large-scale fire tests to investigate flame spread between photovoltaic (PV) solar panels and roof assemblies — the largest array tested to date. Baseline testing with three different PV panel racking orientations identified the design that promoted the fastest flame spread. We then tested two fire mitigation strategies — uncovered walkway and vertical barriers — with that racking orientation. All tests exposed the leading edge of the deck to flames and crosswinds, conditions that compare with related industry standards. Test results quantified fire hazards and mitigation strategies, providing critical data to builders, insurance groups and emergency responders.

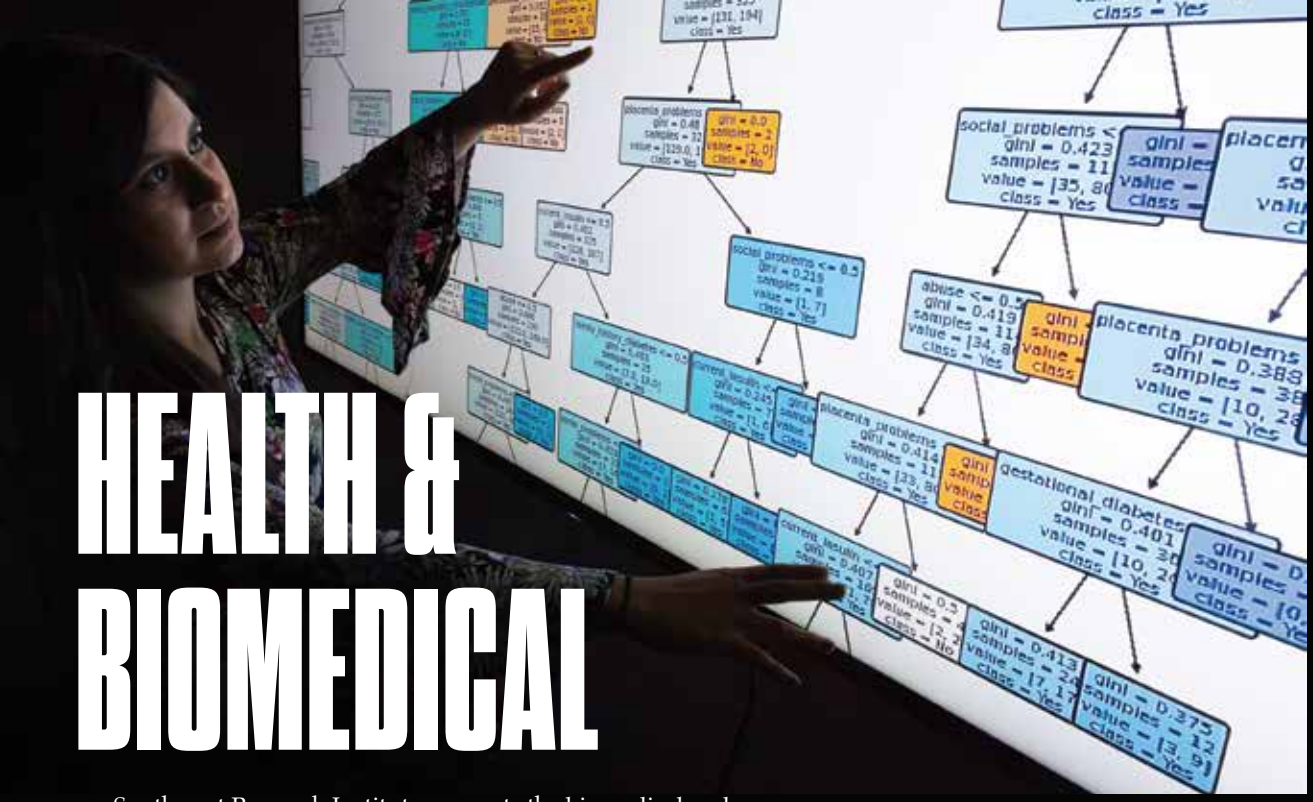
122166

◀ Chemical engineers are developing processes to convert carbon dioxide captured from industrial waste into graphene. This versatile and valuable material is used in everything from biomedical devices to sensors and electronics.

119131

▶ SwRI developed processes to support sustainable aviation fuel production to help the aviation industry achieve goals of exclusive SAF use by 2050.

HEALTH & BIOMEDICAL



122177

◀ SwRI worked with other San Antonio nonprofits to develop a computer model to predict outcomes for pregnant mothers. These data visualizations can guide real-time interventions.

Southwest Research Institute supports the biomedical and healthcare industry, developing biomaterials and pharmaceuticals while supporting injury recovery, community health, human performance and more.

Malaria is spread by mosquitoes, causing an estimated 600,000 deaths annually worldwide, mostly in children. Bed nets that release insecticides have been the first line of defense to reduce malaria transmission; however, mosquitoes are developing resistance, and this approach is proving far less effective than in the past. SwRI is developing new bed netting solutions designed to attack the actual bloodborne parasites that cause malaria. In collaboration with academia, public health and veterans' affairs agencies, SwRI designed netting systems that deliver parasite-targeting drugs to mosquitoes as they land on the nets.

In 2025, we developed an algorithm based on deep neural networks to analyze brain activity recorded from electroencephalography data to distinguish individuals with mild traumatic brain injuries from healthy controls. This algorithm could identify individuals with concussions up to four months after a head injury. Additionally, using brain activity recorded two weeks post-injury, it could predict which patients would experience worsening symptoms in the following months.

We developed a weightlifting app that allows users to track the 3D path of a barbell during lifts. Utilizing computer vision, the app determines the 3D position and pose of the barbell with a single iPad camera, to help improve lifting techniques.

SwRI adapted its markerless motion capture tool, the Engine for Automated Biomechanical Evaluation (ENABLE®), to gather gait data from horses. This internally funded project created a tool that could be used to collect gait data to help identify injuries, understand treatment efficacy and provide sports feedback. Existing tools that measure horse movements are time-consuming to use and require specialized expertise and equipment.

▶ SwRI developed the REFUEL mobile application using a database and algorithms to help the U.S. Air Force analyze human performance and biometric data for mission-critical insights and decision making.

122211

▼ While studying antidotes for pesticides and nerve agents, SwRI researchers discovered that adding calcium chloride during normal-phase chromatography of highly polar compounds resulted in purification equivalent to techniques using more expensive materials and equipment.

122194

122150

▶ SwRI expanded its fire-testing capacities, developing specialized testing rigs to evaluate the structural integrity of construction materials, such as flooring and columns.

MANUFACTURING & RELIABILITY

122210

◀ SwRI developed a distributed, camera-based technology to provide real-time 3D pose estimation for robotic applications using edge devices. The system uses ArUco markers, similar to QR codes, to improve the safety of human-robot interactions.

122146

◀ Using innovative fatigue testing methods, SwRI supports efforts to predict the structural life of additive manufacturing components at production.

Southwest Research Institute supports the manufacturing industry with advanced automation technology, creating adaptive software tools and robot systems while supporting workforce training. We also help make sure aging infrastructure and new products meet or exceed standards for safety, durability and performance.

Engineers are updating the SwRI-created DARWIN® software to predict the structural integrity of metallic components built by additive manufacturing (AM) processes. Known as OPAL, or "One Part And Life," the DARPA-funded initiative rethinks how AM parts are now qualified, exploring the possibility of predicting the life of an individual AM part within 12 hours of production to support surge manufacturing at distributed facilities.*

To support automation applications, SwRI developed a novel distributed camera system that provides real-time 3D pose estimation for robot movements using edge processors. This computing strategy processes data locally, near the source where it's generated. This technique provides faster response times and lower power consumption compared to traditional data-center-based approaches while improving the safety of human-robot interactions.

For 30 years, SwRI has operated the Texas Manufacturing Assistance Center, supporting small and medium manufacturers in South Central Texas with automation and process improvement solutions. Regional demand for manufacturing assistance continues to grow with reshoring trends and growth in the automotive and semiconductor industries as well as with helping defense contractors navigate cybersecurity compliance standards.

SwRI expanded its fire-testing capacities, developing a specialized testing rig to evaluate the structural integrity of construction materials, such as flooring and columns. With maximum design loads of 125,000 and 130,000 pounds, the new capabilities offer the real-world analysis needed to ensure safety and performance of materials in the event of a fire.

* Approved for public release, distribution unlimited.

SwRI STEWARDSHIP

In 2025, Southwest Research Institute continued its longstanding support of the San Antonio community, including contributing more than $1.7 billion to the local economy.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For the sixth year in a row, SwRI employees and their families, the Board of Directors, advisory trustees, retirees, contractors and Signature Science staff members raised more than $1 million for the United Way, for a total of $1,374,050. In addition to pledging money, SwRI staff members volunteered more than 300 hours for 14 different agencies during the United Way campaign in September. The divisions and cost centers also put the fun in fundraising with bake sales, a mini-Olympics, dunking booths and more.

Many of SwRI's community outreach efforts emphasize supporting science, technology, engineering and math (STEM) education, reaching hundreds of students from kindergarten to college. Other STEM support includes participating in career days, judging science fairs, developing STEM curriculum and mentoring students.

In addition, staff members volunteered with local agencies, logging more than 650 hours for the San Antonio Food Bank and delivering nearly 5,000 meals to homebound seniors through Meals on Wheels. The Research Recreation Association hosts monthly blood drives, which allowed employees to donate over 760 pints of blood in 2025. Staff members and their families also volunteered approximately 250 hours the week of Thanksgiving to support the Raul Jimenez Thanksgiving Dinner. Other tech-related charitable initiatives included collecting large boxes of school supplies for San Antonio students and toys for the U.S. Marine Corps Reserve's Toys for Tots Program.

FINANCIAL HIGHLIGHTS 2025

Consolidated revenues hit a record high of **$966** million

Consolidated net assets exceeded **$881** million

Capital expenditures exceeded **$143** million

Consolidated net income from operations was **$33** million

STATEMENTS OF FINANCIAL POSITION | in millions of dollars

	For the year ended September 26, 2025	For the year ended September 27, 2024
Current Assets	$430	$504
Property & Equipment, Net	590	484
Other Assets	152	137
Total Assets	**$1,172**	**$1,125**
Current Liabilities	$192	$206
Noncurrent Liabilities	99	96
Net Assets	881	823
Total Liabilities and Net Assets	**$1,172**	**$1,125**

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Professor, Maseeh Department of
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Environmental Engineering
Cockrell School of Engineering
The University of Texas at Austin
Austin, Texas

Southwest Research Institute
6220 Culebra Road
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Communications Department
Southwest Research Institute
6220 Culebra Road
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Phone 210.522.2257
or solutions@swri.org

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