National Institute of Standards and
Technology
Department of Commerce

SBIR

SMALL BUSINESS INNOVATION

RESEARCH PROGRAM

PHASE I & PHASE II

AWARDS FOR FISCAL YEAR 2025

Introduction

Abstracts of Awards for Fiscal Year 2025 SBIR Program

Note: Certain non-ASCII characters may not be represented accurately in this document.
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Fiscal Year 2025 List of Awards and Awardees

Award Number	Company Name	Phase
70NANB25H080	AAPlasma LLC	Phase I
70NANB25H066	Advanced Cooling Technologies, Inc.	Phase I
70NANB25H065	Advanced Materials Design LLC	Phase I
70NANB25H064	AIVault Inc.	Phase I
70NANB25H069	Aperi Computational Mechanics Consulting	Phase I
70NANB25H079	Aurum Tech LLC	Phase I
70NANB25H075	ChemCubed LLC	Phase I
70NANB25H078	Clear Cut Solutions LLC	Phase I
70NANB25H077	FemtoSenseLabs LLC	Phase I
70NANB25H072	Inhance Digital Corporation	Phase I
70NANB25H070	Intact Solutions Inc	Phase I
70NANB25H081	NanoElectronic Imaging, Inc.	Phase I
70NANB25H072	ObjectSecurity LLC	Phase I
70NANB25H074	Parman Tech, Inc.	Phase I
70NANB25H068	Preczn, Inc.	Phase I
70NANB25H071	Secure Micro Technologies LLC	Phase I
70NANB25H076	ViBo Health Inc.	Phase I
70NANB25H067	X-wave Innovations Inc.	Phase I
70NANB25H140	AMAG Consulting, LLC	Phase II
70NANB25H145	Applied Imaging Solutions, LLC	Phase II
70NANB25H143	Calimetrix, LLC	Phase II
70NANB25H146	HighRi Optics, Inc.	Phase II
70NANB25H141	Icarus Quantum, Inc.	Phase II
70NANB25H144	MyExposome, Inc.	Phase II
70NANB25H142	ObjectSecurity LLC	Phase II
70NANB25H147	Universal Schedule and Booking LLC	Phase II

FY 2025 Phase I Awards

AAPlasma LLC (Grove City, Ohio) — $99,970
Direct destruction of PFAS and other recalcitrant contaminants on filtration media via non-equilibrium plasma — to develop new technology that will allow wastewater treatment plants to destroy persistent contaminants such as PFAS in filtration media. The technology uses a dielectric barrier discharge plasma system to regenerate the filtration media on-site. This can reduce the high costs and inefficiencies associated with thermal reactivation or disposal, offering significant operational savings.

Advanced Cooling Technologies Inc. (Lancaster, Pennsylvania) — $106,499
Manufacturing and measurements of 3D-printed porous structures — pre-standardization research to assess the performance of 3D-printed porous structures used in heat transfer systems in spacecraft and satellites. Establishing standards for manufacturing and testing these structures is crucial for advancing this technology and enabling its widespread adoption.

Advanced Materials Design LLC (Ann Arbor, Michigan) — $100,000
Real time strain imaging tool for additive manufacturing — to develop a real-time strain imaging tool to monitor internal stresses during the 3D printing process. The tool provides data on stresses, viscosity and other factors that can affect print quality. This can help optimize printing speed, reduce defects, and support the development of new materials while improving the overall quality and consistency of 3D-printed parts.

AIVault Inc. (Orlando, Florida) — $99,916
SPARTA: safeguarding prompt-attacked GenAI with robust techniques and algorithms — to develop an antivirus algorithm designed specifically to safeguard generative AI models. The algorithm will use innovative methods to alter the parameters of already trained models to remove adversarial triggers without requiring retraining. The algorithm will primarily focus on models that accept text as input and produce various types of output including natural language, images, videos and software code.

Aperi Computational Mechanics Consulting Inc. (Peralta, New Mexico) — $106,500
Geometrically versatile numerical method for robust image-based simulations — to develop a software tool that automates the process of converting scanned data into simulations. The software aims to streamline workflows and provide new insights that were previously difficult or impossible to obtain. This can help engineers and scientists make informed decisions more quickly and can be applied to a wide range of fields, including manufacturing, aerospace, medicine and defense.

Aurum Tech LLC (El Paso, Texas) — $100,000
Terraforming the future: high-stress restoration via metrology and evolved microbial consortia — a new technology that uses natural selection to develop microbial communities that are adapted to specific environmental stresses such as salinity and drought. This can provide a sustainable solution to soil degradation, which is a major issue worldwide, and could be applied to various fields, including agriculture, environmental remediation, and even space exploration.

ChemCubed LLC (Nesconset, New York) — $99,865
Biodegradable printable insulating dielectric for multilayer rigid and flex printed circuit board (PCB) board manufacturing — to develop a biodegradable, 3D-printable insulating dielectric material for use in

printed circuit board manufacturing. The goal is to create a sustainable, commercially viable material that meets the mechanical and electrical requirements of most sectors of the electronics industry.

Clear Cut Solutions LLC (Port Allen, Louisiana) — $106,500
Re--industrializing metrology for the maritime bulk cargo industry — to enhance the standardization of the metrology associated with the worldwide maritime bulk cargo industry. Replacing current measurement methods, which are often inconsistent and variable, with more repeatable and traceable methods will improve measurement efficiency and accuracy. This could have a major impact on the industry, benefiting service providers, buyers and sellers of bulk commodities.

FemtoSenseLabs LLC (West Lafayette, Indiana) — $100,000
A method for aligning solid-state defects in diamond — to develop a new type of diamond material for use in ultrasensitive magnetic field sensors. The goal is to fabricate a diamond in which atomic defects, known as nitrogen-vacancy centers, are aligned. Currently, these defects are randomly oriented, which limits sensor performance. This technology has the potential to enable more compact and practical magnetic field sensors, which could be used in a range of applications including medical imaging, navigation and geology.

Inhance Digital Corporation (Los Angeles, California) — $97,895
Evaluation, testing, and integration feasibility of Inhance's patient triage and tracking virtual safety and logistics platform (VSLP) with FirstNet — to validate a mass casualty and triage software platform's compatibility and interoperability with FirstNet, a high-speed, nationwide broadband network dedicated solely to first responders. The platform will be useful for public safety organizations, health care providers and emergency response agencies at the federal, state and local levels.

Intact Solutions Inc. (Madison, Wisconsin) — $106,500
Rapid prequalification of the multi-laser powder bed fusion process via path-level thermal history simulation — additive manufacturing with metals is revolutionizing industries by enabling the production of complex, lightweight and customized parts with minimal material waste. This project aims to develop a simulation tool for multi-laser powder bed fusion systems that will help optimize process parameters and reduce defects. This can enable the efficient production of high-quality, large-scale components for industries including aerospace, defense and medicine.

NanoElectronic Imaging Inc. (Riverside, California) — $100,000
Thermal nanoimaging of semiconductor devices — to develop a technique for nanoscale temperature mapping in high-temperature semiconductor devices, addressing a current gap in understanding defect formation in those devices. The proposed solution uses a scanning transmission electron microscope (STEM) to map temperature with nanoscale resolution and has the potential to be used with transmission electron microscopes (TEMs) as well. This technique can benefit researchers developing wide bandgap semiconductor components and studying thermal effects in electronic devices.

ObjectSecurity LLC (San Diego, California) — $106,412
Framework for operational resilience and trust (FORT) — to develop a framework for addressing critical gaps in AI safety and explainability that will provide deeper insights into relationships and patterns in data that influence AI outputs. This will empower developers and end users to more precisely moderate AI-generated content and prevent harmful outputs.

Parman Tech Inc. (Loveland, Colorado) — $106,500
Development of advanced microfluidic module with integrated manifold and tapered capillary for separation of particles by optical forces — to develop an advanced microfluidic module that will support the commercialization of NIST's particle separation technology using optical forces. This technology can make targeted drug delivery more effective, affordable and safe and will be useful in any field in which the manufacture of nanoparticles must meet stringent specifications.

Preczn Inc. (Lewisville, Texas) — $100,000
ResiliPay: secure transactions with AI-driven scalability — to develop a secure and scalable payment platform that leverages advanced Amazon Web Services technologies and meets industry demands while addressing vulnerabilities inherent in traditional payment processing platforms.

Secure Micro Technologies LLC (Phoenix, Arizona) — $99,057
Itus: a flexible hardware bridge for quantum-resistant cryptographic agility and transition — to develop a hardware solution that enhances the interoperability of various cryptographic domains within a computing network. This will allow businesses and other organizations to implement security upgrades, including post-quantum cryptography, in a phased manner that minimizes disruption.

ViBo Health Inc. (Los Angeles, California) — $100,000
Phantoms for mobile MRS calibration and testing — to develop imaging test objects that mimic human anatomy, called phantoms, for use in developing magnetic resonance spectroscopy (MRS) and magnetic resonance imaging (MRI) technologies. The proposed phantoms will enable developers and vendors to test, verify and validate novel MRS and MRI instruments more cost-effectively.

X-wave Innovations Inc. (Gaithersburg, Maryland) — $100,000
Machine learning-based laser powder bed fusion in-situ monitoring package — to develop an advanced machine learning-based technology to improve the quality of metal components produced through additive manufacturing. This project will integrate the new technology into commercial additive manufacturing systems, with potential applications in many commercial and military industries.

FY 2025 Phase II Awards

AMAG Consulting LLC (Schenectady, New York) — $400,000
Scanning electron microscope simulation charging validation and improvements: AMAG sells SimuSEM, a software package that simulates how the electron beams in electron microscopes interact with materials. To improve its product, AMAG will add the ability to model charging effects and magnetic interactions. This will allow the software to add magnetic field and surface roughness effects to its simulations, resulting in more accurate and useful images.

Applied Imaging Solutions LLC (Quincy, Massachusetts) — $400,000
Online short-wave infrared hyperspectral imaging system with machine learning (SWIR-HSI/AI) for measuring quality attributes in NISTmAb-producing NISTCHO cell cultures: This project will develop a new imaging system that uses short-wave infrared hyperspectral imaging and AI machine learning to monitor cell cultures used in the production of biopharmaceuticals. By allowing contactless monitoring of cell viability, metabolite levels and other critical factors, this technology will enable more precise

control of bioreactors. Developed using NISTCHO cell cultures, this project aims to advance the development of life-saving drugs while improving the efficiency and safety of biopharmaceutical manufacturing.

Calimetrix LLC (Madison, Wisconsin) — $399,998
Quantitative phantom for multimodality magnetic resonance imaging and computed tomography measurements of steatotic tissue: Calimetrix will design and develop imaging test objects, called phantoms, that mimic human anatomy and are used to enhance the accuracy of medical imaging tests like MRI and CT scans. These phantoms, which mimic the characteristics of fatty liver tissue, can facilitate medical research and help improve patient care by ensuring that scans taken at different times and using different vendor platforms can be meaningfully compared.

HighRI Optics Inc. (Oakland, California) — $399,858.96
Binary pseudo-random array (BPRA) for the enhancement of optical images: HighRI Optics is developing a commercial imaging system equipped with a calibration standard and specialized data reconstruction software. This innovation aims to substantially enhance the resolution capabilities of virtually any imaging system, including those used in health care, scientific research, manufacturing and defense.

Icarus Quantum Inc. (Boulder, Colorado) — $400,000
Noise-free excitation of semiconductor quantum dots: This project will develop a turnkey photon source based on semiconductor quantum dots technology. The platform, which is engineered for scalability in both fabrication and performance, can house multiple high-efficiency photon sources on a single chip. As a plug-and-play solution, it will help researchers and developers integrate quantum interconnects into their systems, accelerating the development of quantum technologies.

MyExposome Inc. (Philadelphia, Pennsylvania) — $395,814.74
Using silicone wristbands as personal monitors of PFAS exposures: Silicone wristbands are used as wearable monitoring devices that record a person's exposure to environmental chemicals, including certain per- and polyfluoroalkyl substances (PFAS). This project proposes using wristbands combined with novel, solvent-free extraction methods to expand the spectrum of detectable PFAS. Successful implementation of this project will support both research and consumer markets by providing a cost-effective tool for personal exposure monitoring.

ObjectSecurity LLC (San Diego, California) — $399,908.58
Operational technology artificial intelligence — NIST Compliance Tool (OTAI-NCT): The OTAI-NCT tool evaluates the cybersecurity practices of hardware and software manufacturers to produce a cyber-hygiene score that consumers can use to make informed purchasing decisions. The tool, which uses authoritative data sources such as the National Vulnerability Database (NVD), CISA's Known Exploited Vulnerabilities Catalog and other publicly available datasets, will empower users while helping to safeguard national security and public safety.

Universal Schedule and Booking LLC (Harpers Ferry, West Virginia) — $400,000
Phase II home-by-home residential building energy-load profile optimizations: Homeowners face rising energy costs due to surging electricity demand. Energy sensors, if widely installed, can be used to optimize energy use. However, the cost and skills needed to install them present a barrier to their widespread use. This project addresses this challenge by developing a smart digital infrastructure that estimates energy consumption in homes without auxiliary hardware sensors. This will accelerate the adoption of new technologies, enabling a more efficient and resilient electricity grid that benefits U.S. manufacturers, businesses and homeowners.