



NASA's Glenn Research Center's Impact in Ohio from Small Business Innovation Research (SBIR) Program

You know that NASA studies our planet, our Sun, our solar system, and our universe. But did you know about the space program's impact here on Earth?

Glenn Research Center's SBIR program is one of the most successful in NASA at providing increased opportunities for small businesses to participate in federal research and development (R&D), resulting in increased opportunities for private-sector commercialization of innovations derived from federal R&D.

Gynelle C. Steele, Program Manager
 Small Business Innovation Research (SBIR) and
 Small Business Technology Transfer (STTR)
 Gynelle.C.Steele@nasa.gov
<http://technology.grc.nasa.gov>

Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR)

NASA's SBIR/STTR Program provides an opportunity for small high-tech companies (500 employees or less) to participate in NASA-sponsored R&D efforts in key technology areas. In STTR projects, the small business collaborates with a research institution, such as a university.

Since 1983, NASA's SBIR/STTR Program has invested **\$67.8 million** in Ohio's small companies.

NASA's SBIR investments in Ohio totaled **\$3.7 million** in 2009.

SBIR funding has helped companies attract additional funding totaling **\$2 million** in 2009 and **\$7 million** in 2010.

These Ohio businesses currently participate in NASA's SBIR/STTR Program (Phases 1 and 2).

| Company | Ohio Location | Company | Ohio Location |
|---------------------------------------|---------------|-------------------------------|----------------------|
| Cornerstone Research Group, Inc. | Dayton | Powdermet, Inc. | Euclid |
| Energy Focus, Inc. | Solon | RNET Technologies, Inc. | Dayton |
| Innovative Scientific Solutions, Inc. | Dayton | Sierra Lobo, Inc. | Fremont |
| Lake Shore Cryotronics, Inc. | Westerville | Spectra Research, Inc. | Dayton |
| Nastec, Inc. | Brook Park | Spectral Energies | Dayton |
| N&R Engineering | Parma Heights | Sun Valley Technology | Warrensville Heights |
| NTI, Inc. | Fairborn | SynGenics Corp. | Delaware |
| | | Wright Materials Research Co. | Beavercreek |

The following Ohio companies recently received additional funding (Phase 3) totaling \$7.4 million.

| Company | Technology/Funding Source |
|--------------------------------------|--|
| Hyper Tech Research, Inc. (Columbus) | Funding from Ohio's Third Frontier initiative, Rolls-Royce, and the Department of Energy to develop wires and coils for superconducting fault current limiters (FCLs); and funding from Ohio's Third Frontier initiative for magnesium diboride (MgB ₂) for next-generation magnetic resonance imaging (MRI) systems |
| WebCore Technologies (Miamisburg) | Funding from Ohio's Third Frontier initiative for commercialization of TYCOR [®] engineered fiber reinforced composite cores for wind turbines; and NASA funding for the development and demonstration of advanced composite sandwich structure technology for launch vehicle applications |



More information on NASA's SBIR/STTR Program is available online: <http://sbir.nasa.gov>

impact in Ohio

NASA and
its partners...

innovating
in space,
innovating
in Ohio.

Spinoffs to Ohio Companies*

Innovative technologies from NASA's space and aeronautics missions can be used in other ways that benefit society. Therefore, NASA is committed to "spinning off" its innovations into new products—as well as providing access to its technologies, facilities, and expertise. Many more amazing spinoff stories, like the following, appear in NASA's yearly *Spinoff* magazine (available at: <http://www.sti.nasa.gov/tto>).

Hyper Tech Research, Inc. (Columbus)

Working with Glenn under an SBIR contract, Hyper Tech developed innovative technology for use in turboelectric aircraft with distributive propulsion, which has the potential to widen the design space of future aircraft and substantially reduce fuel burn. Hyper Tech's high-temperature superconductor (HTS) magnesium diboride (MgB₂) wire is lighter and cheaper than other comparable superconductors and can provide AC tolerant, low loss, and lightweight performance. This SBIR technology is contributing to the development of several environmentally friendly products, such as a fully superconducting generator for wind turbines. The superconductor wire is being developed for use in next-generation magnetic resonance imaging (MRI) systems that do not require cooling in liquid helium, a dwindling natural resource. It is also benefiting superconducting fault current limiters (FCLs) that could be used to limit fault induced surges when renewable energy systems are added to the electrical grid. The early-stage investment from NASA's SBIR program has helped leverage more than \$10 million for product development, and it has propelled Hyper Tech into becoming a world leader in commercialized MgB₂ superconductor wire.

Lambda Technologies (Cincinnati)

In the late 1990s, NASA needed to improve the fatigue life of superalloys used in high-temperature settings. Lambda Research—now part of the Lambda Technologies group—had a patented but not fully tested method that seemed perfect for the job. Under an SBIR contract from Glenn, the company developed its low plasticity burnishing (LPB™) method that can significantly increase durability and life span of metal components. In addition to meeting NASA's needs, the LPB method now has several commercial applications, such as for military and commercial aviation and to improve the quality of life for recipients of hip transplants. Currently, the U.S. Navy and Air Force, Delta Airlines, Idaho National Laboratory, and orthopedic equipment manufacturers all use the LPB method.

Lake Shore Cryotronics, Inc. (Westerville)

Under SBIR contracts with NASA's Jet Propulsion Laboratory and Langley Research Center, Lake Shore Cryotronics has developed a more affordable, high-performance optical filter to help select the desired wavelengths of light that reach the detectors in telescopes used in infrared (IR) astronomy. This long wave pass IR optical filter is composed of a lattice of monocrystalline silicon and will not delaminate at the near-absolute-zero temperatures to which the filter and detector are cooled during use. The filter has been integrated into NASA's next-generation IR telescopes, and Lake Shore has used the technology to develop two standard IR filter products that can be used in commercial astronomy applications or in the burgeoning field of terahertz imaging.

Sierra Lobo, Inc. (Fremont)

Sierra Lobo developed the Cryo-Tracker® Mass Gauging System (Cryo-Tracker MGS) under a Phase 3 SBIR contract with NASA's Kennedy Space Center, after receiving Phase 1 and 2 funding from the U.S. Department of Defense. The sensing system is designed to monitor gas propellants that are stored at cryogenic temperatures to reduce their volumes and allow their storage in smaller tanks. In addition to the SBIR funding, Sierra Lobo has received funding from NASA's Innovative Partnerships Program Seed Fund to advance the system's flight readiness for use on the next generation of NASA and commercial launch vehicles in which gaseous propellants are cooled and stored for extended periods through a process called densification. The company is now marketing the Cryo-Tracker MGS tool as a commercial product for monitoring super cooled liquids during transport or storage in testing facilities and in the medical, metals processing, and semiconductor manufacturing industries.

TechnoSoft Inc. (Cincinnati)

Under an SBIR contract with Langley, TechnoSoft designed the Collaborative Hypersonic Air-breathing Vehicle Design Environment (CoHAVE) software to perform modeling and analysis of space transportation system concepts with higher fidelity and earlier in the design process than ever before. Built on the framework of the company's Adaptive Modeling Language (AML) software that was designed for the U.S. Air Force, CoHAVE has been extended to incorporate models for applications other than traditional hypersonic air-breathing vehicles and has been renamed the Integrated Design and Engineering Analysis Environment (IDEA). Engineers can use IDEA and the enhanced AML platform to analyze a variety of customized models for different designs, including fluid dynamics, aerodynamics, structural design, and plenary models. The technology has a variety of commercial applications, including enabling ongoing cost analysis for surface ships, automobiles, space vehicles, power plant filtration systems, and wind turbines.

**Publication herein does not constitute NASA endorsement of the product or process, nor confirmation of manufacturers' performance claims related to any particular spinoff development.*

™ LPB is a trademark of Lambda Technologies.

® Cryo-Tracker is a registered trademark of Sierra Lobo, Inc.

NASA's Glenn Research Center has contributed core technologies to nearly 200 "spinoff" products. Inventions born in aeronautics and space research have found new life in consumer goods and other areas of our lives. *Spinoff* magazine has tracked more than 60 Ohio companies whose products have benefited from collaboration with NASA.