National Aeronautics and Space Administration

NASA's Impact in Delaware: A Tech Transfer Perspective

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

In 2011, NASA invested over **$8 million** in the state of Delaware.

Since 2001, NASA's SBIR/STTR Program has invested nearly
$6.5 million in **7 Delaware companies**
and more than **$1.2 billion** nationwide.

How NASA's SBIR/STTR Program Benefits Delaware

NASA is committed to moving technologies and innovations into the mainstream of the U.S. economy, and the Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) program helps fulfill this goal.

SBIR/STTR stimulates technological innovation by encouraging small, high-tech companies—particularly minority and disadvantaged businesses—to partner with NASA to help meet its research and development needs in key technology areas. At the same time, this program strengthens small companies by enabling them to bring cutting-edge new products into the U.S. economy.

The list to the right highlights Delaware businesses that received SBIR/STTR contracts from NASA since 2001. **(Visit http://sbir.nasa.gov for more information on the SBIR/STTR program.)**

NASA SBIR/STTR Companies in Delaware

Accudyne Systems, Inc.	Newark
AlphaSense, Inc.	Wilmington
Compact Membrane Systems, Inc.	Wilmington
EM Photonics	Newark
Nassau Stern Company	Newark
Princeton Optronics, Inc.	Mercerville
Spectrum Magnetics, LLC	Wilmington

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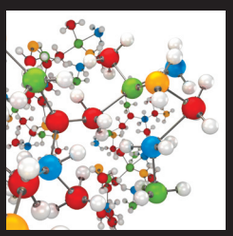
How NASA Spinoffs Benefit Delaware

Space Suit Spinoffs Support Medical, Personal Protection, Aerospace Industries (Frederica)

ILC Dover, Inc. has designed and produced space suits for many manned NASA missions. ILC has built upon its NASA-honed expertise to create an array of spinoff products for the medical, pharmaceutical, personal protection, and aerospace markets.

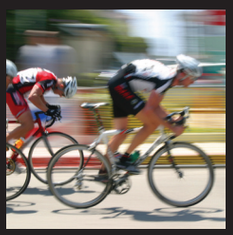
Innovations include therapeutic cooling and heating suits to assist patients suffering from various maladies, life-saving gas and chemical masks to protect people from chemical warfare and hazardous materials, and lighter-than-air, blimp-like structures used for passenger transport and surveillance. Pharmaceutical applications include an array of high containment solutions that enable the safe and effective processing of active ingredients. ILC also discovered that the same radio frequency molecular stimulation they use to fasten space suit components together can generate low levels of heat deep within muscles for treating muscular stress, which led to a new biomedical device. From space exploration to physical therapy, from defense to pharmaceutical, NASA spinoffs have helped ILC Dover develop real-world solutions for a vast range of industries.



NASA Software Aids Researchers in Complex Drug Designing Process (Wilmington)

NASA software helped researchers at E.I. du Pont de Nemours and Company model the energy and motion of drug and enzyme bonding during the drug design process. Drugs affect biological systems—such as the human body—by interacting with enzymes, complex proteins that catalyze specific biochemical reactions at body temperature. A drug "fits" into an enzyme's receptor slot like a key into a lock. The shape of a drug molecule determines the coupling between the drug and a particular enzyme, with each bonding stage having specific biochemical results.

The NASA software enabled DuPont researchers to model potential drugs as a series of aggregates and springs then analyze the vibrational and static motions of these independent components. This information is used to design specific drugs to interact with particular enzymes in designated ways. The ability to automatically and numerically solve equations of motion and reduce laboratory experimentation saved DuPont substantial time and money.



High-Tech Racing Wheel Combines Industry Composite Technology with NASA Know-How (Wilmington)

E.I. du Pont de Nemours and Company collaborated with NASA and the bicycle industry to produce an aerodynamic wheel for racing bikes. The racing wheel combined DuPont's composite technology with NASA's aerodynamic and computer modeling expertise. The DuPont engineers conducted extensive research on the latest data available on drag coefficients for NASA airfoils and determined an optimum profile to balance aerodynamic and structural needs.

The team employed a design in which each spoke is in effect an airfoil, with a blunt leading edge and a thin trailing edge to maximize aerodynamic efficiency as the spoke moves through air like a helicopter's rotary wing. Consisting of a composite material of epoxy resin reinforced by fibers of carbon, glass, and synthetic material, the wheel reduces drag and increases bicycle control and stability in crosswinds.

NASA actively seeks partnerships with U.S. companies that can license NASA innovations and create "spinoffs" in areas such as health and medicine, consumer goods, transportation, renewable energy, and manufacturing. When businesses leverage NASA technologies to develop new products, it not only benefits the regional economy, but significantly strengthens the nation's competitiveness in the global marketplace.

NASA's centers across the country have helped 8 Delaware companies develop revolutionary spinoff technologies.

Learn more about how NASA innovations benefit the public in *Spinoff*, an annual publication that highlights NASA's most significant technology transfer successes.
(Available at: http://www.sti.nasa.gov/tto)

National Aeronautics and Space Administration

Office of the Chief Technologist
NASA Headquarters
Washington, DC 20546

www.nasa.gov

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

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