National Aeronautics and Space Administration

NASA's Impact in Michigan: 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 nearly **$28 million** in the state of Michigan.

Since 2001, NASA's SBIR/STTR Program has invested over
$26 million in **27 Michigan companies**
and more than **$1.2 billion** nationwide.

How NASA's SBIR/STTR Program Benefits Michigan

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 Michigan 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 Michigan

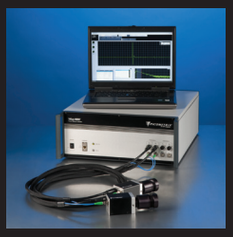
Aerophysics, Inc.	Allouez
Baker-Calling, Inc.	Ann Arbor
Claytec, Inc.	East Lansing
Comet Technology Corporation	Ann Arbor
Cybernet Systems Corporation	Ann Arbor
ElectroDynamic Applications, Inc.	Ann Arbor
EMAG Technologies, Inc.	Ann Arbor
ePack, Inc.	Ann Arbor
Evigia Systems, Inc.	Ann Arbor
FlexSys, Inc.	Ann Arbor
I/NET, Inc.	Kalamazoo
Integrated Sensing Systems, Inc. (ISSYS)	Ypsilanti
Michigan Aerospace Corporation	Ann Arbor
Michigan Engineering Services, LLC	Ann Arbor
Microcide, Inc.	Detroit
Munro & Associates, Inc.	Troy
Opteos, Inc.	Ann Arbor
Picometrix, LLC	Ann Arbor
sci_zone	Holland
Soar Technology, Inc.	Ann Arbor
Solidica, Inc.	Ann Arbor
T/J Technologies, Inc.	Ann Arbor
Technova Corporation	Lansing
Thermal Wave Imaging, Inc.	Ferndale
Translume, Inc.	Ann Arbor
Virtual EM, Inc.	Ann Arbor
Xiomas Technologies	Ypsilanti

michigan

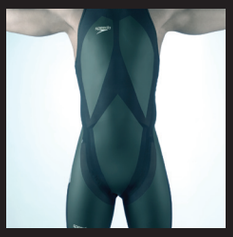
www.nasa.gov

HQ-ART-MI-001.indd 1 2/25/12 3:01 PM

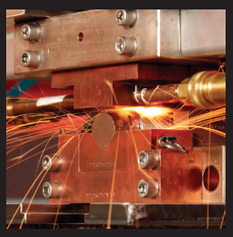
How NASA Spinoffs Benefit Michigan



Terahertz Imaging Technique Detects Defects, Scans for Weapons and Explosives *(Ann Arbor)*
An imaging technique originally designed to detect potential flaws in the insulating foam of the space shuttle is now being used to scan for concealed weapons and explosives in airports. SBIR program funding allowed Picometrix, a subsidiary of Advanced Photonix, Inc., to refine and adapt its terahertz imaging devices for use in manufacturing environments. In addition to security applications, other uses include determining the uniformity of coating thicknesses, detecting product defects, and producing pharmaceuticals.

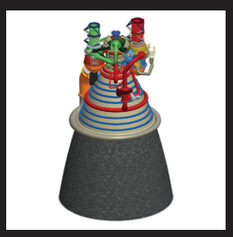


NASA Know-How Helps Swimmers Rocket Through Water *(Flint)*
NASA's expertise in the area of fluid dynamics helped US Speedo, Inc. design a hydro-dynamically advanced swimsuit that reduces drag and provides extra compression, allowing athletes to swim more efficiently. NASA engineers evaluated the surface roughness effects of nearly 60 fabrics or patterns in a low-speed wind tunnel to assess which fabrics and weaves had the lowest drag. Speedo connected multiple pieces of the resulting water-resistant and lightweight swimsuit fabric together using ultrasonically welded seams and low-profile zippers to minimize viscous drag. Additionally, the extra compression enables athletes to swim longer and faster since they use less energy to maintain form.

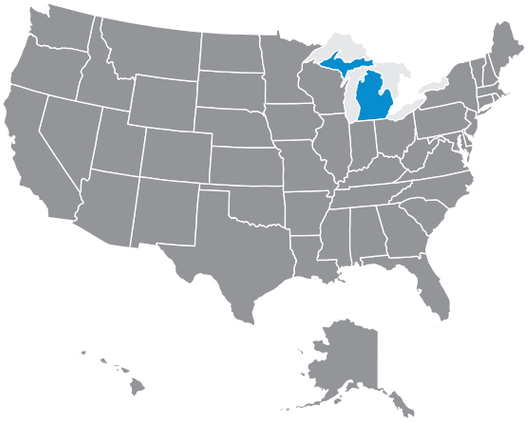


Revolutionary Welding Process Has Applications for Host of Industries *(Auburn Hills)*
A NASA collaboration refined a novel welding process with applications in the aerospace, automotive, medical device, and steel infrastructure industries. Deformation resistance welding (DRW) forms nearly instantaneous, full-strength, automated leak-tight welds. With DRW, designers can create lean structural assemblies by joining tubular components to other tubes, sheets, or solids, optimizing cost and performance. SpaceForm, Inc. has targeted the automotive industry as a launch point for this state-of-the-art technology, with initial applications for chassis/suspensions, roof frames, cross-car beams, and exhaust systems.

Gesture Recognition Software Enhances Weather Forecasts *(Ann Arbor)*
Cybernet Systems Corporation integrated its gesture recognition technology with NASA's virtual astronaut software to create a gesture-controlled International Space Station kiosk exhibit. Visitors led their own space station tours as they moved through the exhibit, manipulating doors and viewports with hand gestures. Building upon the collaboration, Cybernet developed a weather map management system that utilizes both body tracking and gesture recognition technology for televised weather reports. The software enables meteorologists to control the computerized visual effects on weather maps in real time using hand gestures and body movements.



Simulation Software Enables More Accurate Prototype Testing *(Troy)*
LMS International NV developed a system-response computer model that helped NASA calculate side-wall loads for its J-2X rocket nozzles. The collaboration aided NASA's development and offered LMS engineers a unique opportunity to gather test data. Combining test data with modeling and predictive tools enables engineers to more accurately test, analyze, and optimize design prototypes. The company is now using this knowledge to develop modeling and simulation software to create virtual prototypes of vehicles and mechanical systems in a wide range of industries. Key focus areas include structural integrity, system dynamics, handling, safety, reliability, comfort, and sound quality.



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 48 Michigan 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.

NP-2012-01-805-HQ | 1.31.12