



# MATRIC

Researchers Busily Creating Exciting  
New Products and Technologies

By Keith A. Pauley

In its February 13 issue, *Time* magazine openly asked the question: "Is America flunking science?" Sadly, in many ways the answer to this question is "yes."

With researchers in the United States being surpassed by foreign inventors in numbers of patents, scientific articles published and earned doctorates in science and engineering, America is clearly at a technological crossroads. Amazingly, the U.S. government and the private sector combined spend less than 3 percent of our gross domestic product on research and development. Worldwide, our nation ranks only 25th in the percentage of 24-year olds with science degrees.

The Mid-Atlantic Technology Research and Innovation Center (MATRIC) in South Charleston is helping to stop these declining trends at the borders of West Virginia. By creating dozens of high-tech jobs in chemical and environmental technologies, health and life sciences and defense and aerospace systems, MATRIC hopes to renew West Virginia's love for pioneering discovery and offer enticing employment opportunities to our state's brightest young minds.

Our passion is for creating new technologies that actually impact the lives of average people. New energy sources from common plants and other biological materials, dramatic new medical diagnostic devices and spacecraft to explore the solar system are just a few of the technologies that MATRIC's engineers and scientists are working on today.

MATRIC was founded in 2003 by a small group of thoughtful community leaders – a group that included five state university presidents and more than a dozen presidents of our state's largest corporations. Since then, MATRIC has grown rapidly. Today, we have a staff of more than 25 and more than \$6 million in contracts. Two-thirds of these professionals hold advanced degrees, and more than half of them hold doctorates.

And we are poised to grow even more rapidly due to two factors: world-class people and innovative technologies that can truly change people's lives.

Here's a sampling of our efforts:

## \$65-per-barrel oil

Oil priced at \$65 per barrel impacts the bottom line of West Virginia's residents and industries. This is why MATRIC is pushing new technologies for energy from coal and biomass.

In a creative use of gasified coal, MATRIC scientists believe that in addition to electricity, other products such as transportation fuels, fertilizers and chemicals can also be formed. This so-called Polygeneration concept will allow the United States to move further along the path toward independence from Middle East petroleum.

Another increasingly important energy source may be waste from animal production, such as chickens and hogs. Through a project with West Virginia State University, MATRIC staff is working on a digestion process that produces a fuel gas and other valuable products. This technology will solve a growing environmental problem while helping to diversify our nation's energy sources.

## People Matter Most

A recent study by the National Academies sounded the alarm that more than 5,000 Americans die each year from medical errors. MATRIC's biomedical engineering staff is working aggressively to create technologies that may substantially reduce these errors.

Medical Smartcards, which hold time-critical data such as drug allergies and other known medical conditions, have been developed by MATRIC for use by first responders and EMTs. These credit card-sized devices will communicate this vital information within the first precious moments of an emergency situation.

Further, new techniques to locate medical device errors during the FDA-approval process have been developed by



MATRIC staff. Every year, new medical devices cause injuries and fatalities, such as insulin pump malfunctions, due to errors that can now be found before the device is ever fielded in a hospital or clinic.


### Looking to the Sky

The National Aeronautics and Space Administration has become MATRIC's largest customer through the Independent Verification and Validation Facility in Fairmont, West Virginia. Currently, MATRIC conducts systems engineering analysis on a variety of spacecraft, including the International Space Station, Mars Reconnaissance Orbiter and the latest mission to Pluto called New Horizons.

MATRIC, with its teammate Geocontrol Systems of Houston, Texas, will soon be operating the software development portion of the IV&V Facility as well. MATRIC computer programmers will develop advanced tools to assess the safety and quality of the flight critical software on each NASA spacecraft.

### Fire of Discovery

With a growing national reputation for solving tough technical problems, MATRIC is truly advancing science in ways that organizations in other states have not. Government and industry have equally found that MATRIC is a valuable partner in research and development for creative problem solving.

As a growing R&D center, MATRIC hopes to rekindle the fire of discovery in science and technology in West Virginia and throughout the United States. If our young people are looking for exciting science, they need to look no further than MATRIC. 



Keith A. Pauley is president and CEO of the Mid-Atlantic Technology, Research and Innovation Center (MATRIC), a non-profit research and development corporation with headquarters in South Charleston. For more information, go to [www.matric.cc](http://www.matric.cc).



## BASIC

### Biotechnology and Allied Sciences Incubation Center

At the South Charleston Technology Park



The Ideal Location For Incubation of Laboratory-Based Enterprise:

- Laboratory and office facilities
- Shared business equipment and services
- Fiber optic connectivity
- State-of-the-art auditorium and conference room facilities
- Access to pilot-scale manufacturing facilities and world-class waste treatment and transportation infrastructure



For more information, contact: [johnmaher@cazwv.com](mailto:johnmaher@cazwv.com)  
304-340-7082