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WEST VIRGINIA JOURNAL OF SCIENCE AND RESEARCH | SUMMER 2010

in this issue

West Virginia Higher Education Policy Commission

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On the Cover

WVU CHEMISTRY PROFESSOR'S RESEARCH EXPANDING, ALONG WITH STUDENTS' OPPORTUNITIES

This is the fourth in an ongoing series of features on scientists and science educators from institutions across West Virginia.

Dr. Xiaodong Michael "Mike" Shi is an assistant professor in the West Virginia University C. Eugene Bennett Department of Chemistry and a participant in the WVNano Initiative. Shi, who was supported by the 2006 EPSCoR Research Infrastructure Improvement Award, recently received a five-year, $550,000 National Science Foundation (NSF) CAREER Award – the largest award of its kind at WVU.

The Faculty Early Career Development (CAREER) Program offers the NSF's most prestigious award in support of junior faculty who exemplify the role of teacher-scholars.

As a result of the award, Shi is conducting research on compounds that will be applicable to biomedical and material investigations that could revolutionize health care, biosensor and energy industries. He is examining the 1,2,3-trizole chemical as a new building block in the formation of transition metal complexes and synthesis of multi-functional chemicals.

"Once we find the building block, we can apply it to many fields," Shi said.

As part of the CAREER award, Shi also has developed an educational plan that includes travel to China for undergraduate students. This 8-week study-abroad program, which also is supported by the WVNano SURE Program, began this summer with 10 students and will continue for the next four years.

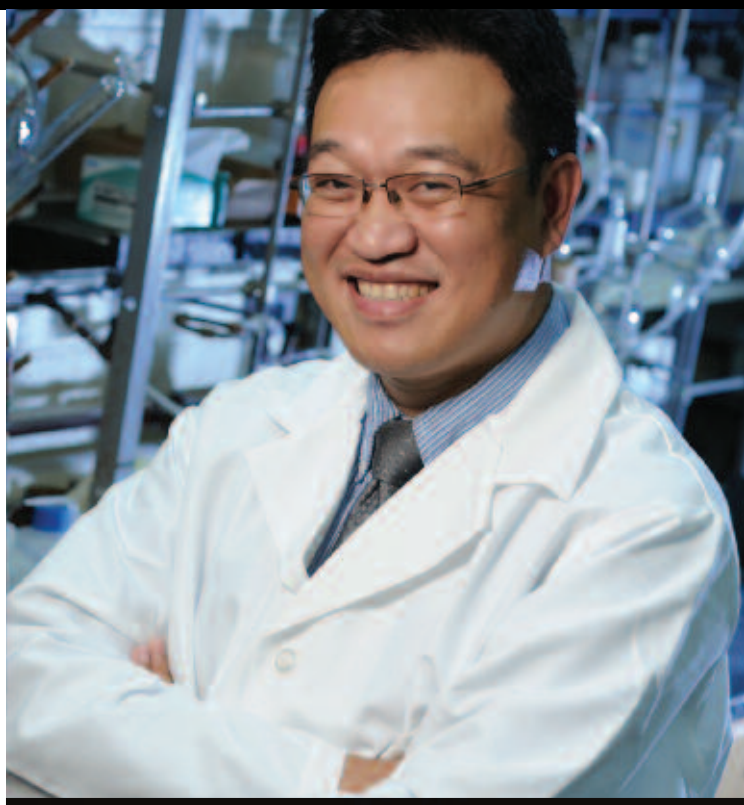
"We get to show students not only how the other side of the world does science, but we also expose them to different cultures, which is good for the next generation of West Virginia's globalized research environment," Shi said.

Through this travel component and his full educational plan, he hopes to increase the participation of underrepresented, minority groups in science, technology, engineering and mathematics.

Shi is offering a new course, "Molecular Recognition in Nanotechnologies," which will be open to undergraduate and graduate students this spring. Three undergraduate students presently work in his lab, and he expects to work with more in the next year.

Shi grew up in China and came to the United States in 1997. In 2005, he joined WVU, where he says he has been given the support he needs to do research that continues to be recognized in science journals.

"West Virginia University has provided the platform for me to do the research, and they've given me many opportunities for collaboration," Shi said. "In just four years, my lab has produced 20 publications. You simply can't generate that kind of activity without full support from the university."



Background

- Bachelor's degree, Nankai University, China
- Doctoral degree, University of Maryland
- Postdoctoral research associate, University of California at Berkeley
- Platform research scientist, General Electric Advanced Materials

sustainability

how science, technology and research can sustain our future

about the Division of Science and Research

The Division of Science and Research provides strategic leadership for infrastructure advancement and development of competitive research opportunities in science, technology, engineering and mathematics disciplines. The office directs the National Science Foundation's Experimental Program to Stimulate Competitive Research (EPSCoR) in West Virginia, coordinates scientific research grants to academic institutions from federal and state agencies, and conducts outreach activities to broaden the public's understanding of science and technology. *Vision 2015: The West Virginia Science and Technology Strategic Plan* is available online at **http://www.wvresearch.org**.

STaR SYMPOSIUM **2010**

September 27-28

This fall, West Virginia's science, technology and research community is invited to gather in Huntington for STaR Symposium 2010, the third biennial conference that focuses on competitively-funded research propelling West Virginia forward in innovation.

The symposium will be held on September 27-28 on the campus of Marshall University and will feature remarks from Michael Specter, author of *Denialism*, a meticulously reported investigation of the growing mistrust among people around the world of science and its byproducts.

The theme of this year's symposium, "Sustainability: How Science, Technology and Research Can Sustain Our Future," will be carried throughout panel discussions on energy, the environment, cyberinfrastructure and the economy.

In addition, the conference will offer breakout scientific sessions featuring the work of some of West Virginia's leading scientists and education leaders, as well as a student poster competition that will name one graduate and one undergraduate researcher of the year.

For more information and to register for the symposium, visit: **www.wvresearch.org/starsymposium**.

www.wvresearch.org/starsymposium

U.S. ECONOMIC DEVELOPMENT ADMINISTRATION FUNDS PLANNING AT TECHNOLOGY PARK

Planning is in full gear at the West Virginia Education, Research and Technology Park thanks to a $250,000 grant from the United States Economic Development Administration. The Higher Education Policy Commission received the award as a result of a proposal submitted in 2009 by Dr. Paul Hill, Vice Chancellor for Science and Research.

As a result of this award, the Commission contracted with Battelle and CH2M HILL. These firms are in the process of mapping out long-range development plans for the park, which was accepted by the Commission as a donation from The Dow Chemical Company earlier this year.

On July 29, Battelle officials met with members of the park's transition steering committee and provided an update on their work.

Mitch Horowitz, Vice President and Managing Director of Battelle's Technology Partnership Practice, said their approach has begun with an assessment phase, which includes evaluating economic development targets of opportunity, along with buildings and labs. The second phase of their plan – development planning – will include program development, as well as plans for buildings, governance, budgeting and operations.

"We're here to help capture the momentum of the development opportunities at this park," Horowitz said. "This site is precious, and it needs to be something significant that fuels economic development. Research parks have become hubs, and when you do things right, they are a magnet for growth."

Battelle is a leader in the development, commercialization and transfer of technology for industrial and governmental clients. They also manage major federal laboratories. Battelle's Technology Partnership Practice has developed advanced energy technology strategies in a variety of areas, including bio-energy development, energy efficiency and clean coal.

Battelle is partnering with CH2M HILL – a program management, construction management and design firm.

For more information, visit the park's newly-launched website: **www.wvtechnologypark.com.**

Photos – John Sibold, Commercial Photography Services of West Virginia

MARSHALL UNIVERSITY INSTITUTE PARTNERS WITH BIOTECHNOLOGY LEADER

The Marshall Institute for Interdisciplinary Research (MIIR) recently announced it has entered into an applied research and product development partnership with a leading biotechnology company, Integrated DNA Technologies (IDT).

Scientists at MIIR will develop optimized biomolecular analyses, or "assays," to be used by IDT for the detection and quantification of ribonucleic acid (RNA). The goal of the co-development project is to significantly improve the specificity of IDT's current assay methods without substantially increasing the cost.

IDT's custom synthesized DNA and RNA products are used by researchers around the world to help develop diagnostic tests for diseases like breast cancer and AIDS, to conduct research to discover new drugs or treatments for a variety of diseases, and to produce safer and more plentiful agricultural products.

Dr. Eric Kmiec, director of MIIR and the institute's lead research scientist, said, "We are honored an industry leader like IDT has selected us to develop and test a product for them. In effect, the agreement endorses our institute's innovative platform technology approach. There is definitely a niche out there for what we do."

Dr. Joan Wilson, who joined MIIR last summer as a senior scientist, will be responsible for executing the IDT project. Her research group at MIIR focuses on identifying non-coding RNA disease biomarkers and developing non-coding RNA-based tools for gene regulation and genome manipulation.

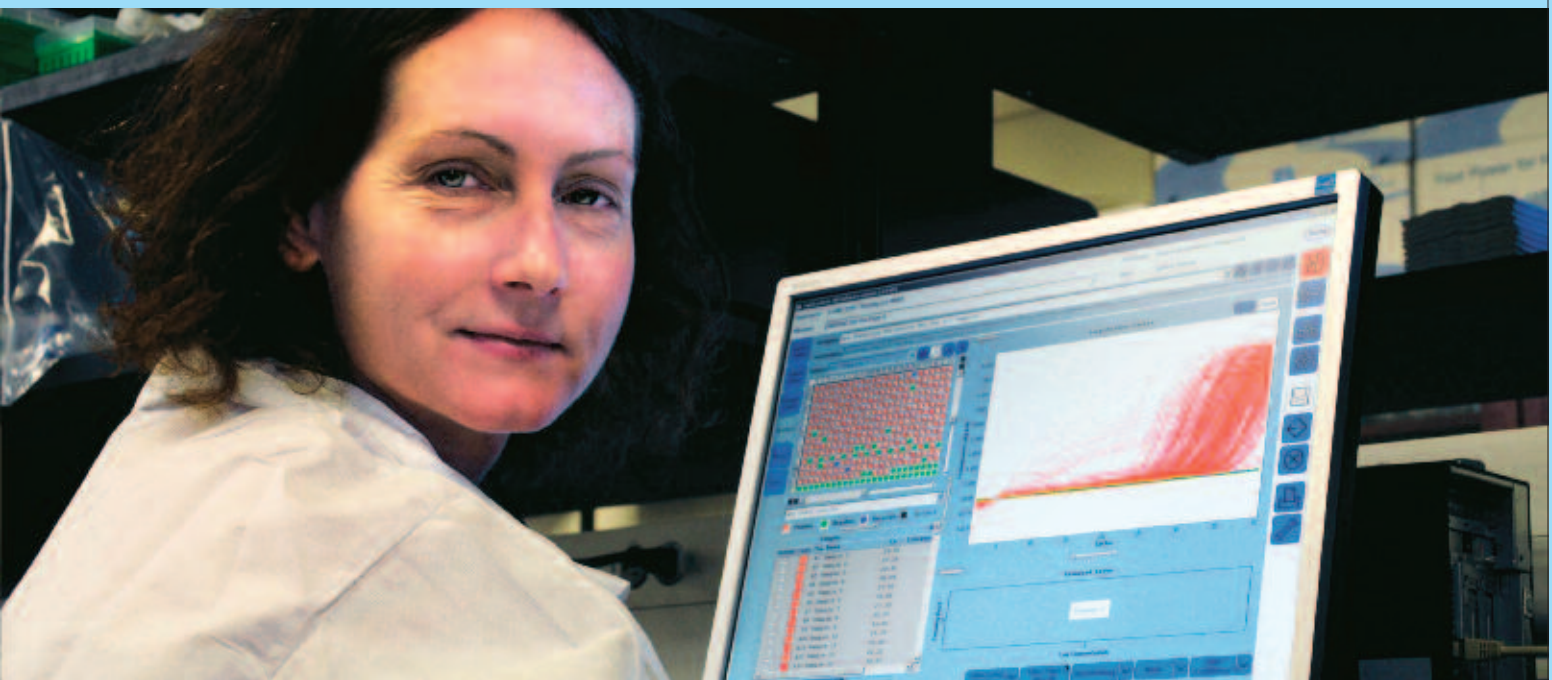
Kmiec said Wilson's experience in the fast-growing field of non-coding RNA biology was what attracted IDT.

"It's really a perfect fit," he said. "IDT recognized the market potential for these optimized assays but did not have the resources to pursue the technology on its own. We have the facilities, and in Dr. Wilson we recruited the type of scientist who does cutting-edge research coupled with platform-based technology development."

Wilson said, "Creative opportunities like this are one of the reasons I chose to join MIIR. It is incredibly exciting to be associated with IDT. Their commitment to quality and innovation is unrivaled. I look forward to working with them to help develop critical RNA-focused research tools and to further MIIR's involvement in this high-impact field."

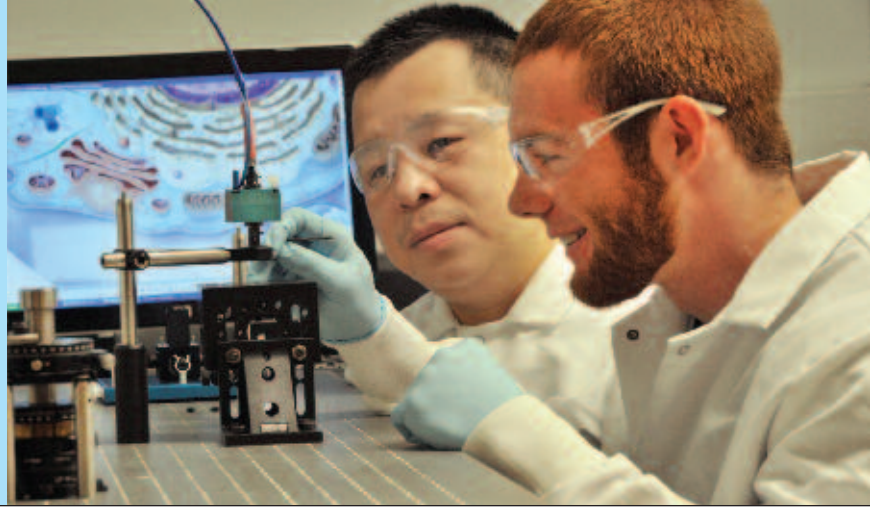
The mission of the institute, which was created through the state's "Bucks for Brains" Research Trust Fund, is to advance regional economic development, student education and workforce training. For more information, visit **www.marshall.edu/miir.**

Pictured: Dr. Joan Wilson, senior scientist at the Marshall Institute for Interdisciplinary Research



Photos – West Virginia Department of Commerce

SCOTT CUSHING, WVNANO SURE FELLOWSHIP WINNER, NAMED GOLDWATER SCHOLAR



"I am deeply honored to be chosen. I think this award speaks to the academic quality of WVU – especially the talented students, faculty and staff the university attracts."

Scott Cushing
West Virginia University junior

Scott Cushing, a West Virginia University junior studying physics with an area of emphasis in materials science, has won a Barry M. Goldwater Scholarship, a prestigious award that recognizes exceptional college students who have the commitment and potential to make a significant contribution in the science, mathematics and engineering fields.

Currently, he is working on developing a visible light activated photocatalyst. Usually, titanium (IV) oxide photocatalysts are only activated by UV light, but by combining nanoscale features and surface plasmon resonance, Cushing has been able to make the photocatalyst useful in the visible light range.

Devices that are currently only effective with special UV lamps can now be efficiently powered by visible light – sunshine, household lights and other common lighting sources.

His photocatalyst could be used to break down water into its component parts of hydrogen and oxygen as an energy-efficient way to power hydrogen fuel cells. Or it could be used as an eco-friendly cleaning solution, breaking down harmful viruses on commonly used surfaces.

Cushing has been working on this project since he was a freshman with Dr. Nick Wu, assistant professor of mechanical and aerospace engineering and participant in WVNano, WVU's focal point for discovery and innovation in nanoscale science, engineering and education. WVNano was elevated to a statewide initiative through the 2006 EPSCoR Research Infrastructure Improvement award.

Cushing's research was supported in part by WVNano's SURE program, which promotes undergraduate students' interdisciplinary research in nanoscale science and engineering.

SIX PH.D. STUDENTS AT WVU WIN AMERICAN HEART ASSOCIATION FELLOWSHIPS

American Heart Association
Learn and Live

Six graduate students at West Virginia University have been selected to receive American Heart Association pre-doctoral fellowships. The recipients are studying in four different WVU Health Sciences Ph.D. programs. They are: Walter Baseler, a graduate of the University of Maryland; Adam Goodwill, of Warren, Pa.; Kelly Miller, of Middleburg, Pa.; Holly Damron, of Oak Hill, W.Va.; and Jianying Huang and Xueping Zhou, both of China.

"This accomplishment is a testament to the scientific prowess of our students and their faculty mentors," said Fred L. Minnear, Ph.D., assistant vice president for graduate education.

Minnear noted that in the past seven years, only two students from WVU have received this competitive fellowship. All six of this year's recipients, he added, benefitted from the Scientific Writing course taught by Bernard Schreurs, Ph.D., a researcher at the Blanchette Rockefeller Neurosciences Institute.

CONCORD UNIVERSITY SOFTWARE PROMOTING TOURISM

Software developed at Concord University is pointing the way for tourists. Dubbed "eigenweg™" by its designers, this innovative system provides a one-stop digital source for tourist information. Eigenweg (pronounced ike-en-vek) translated from Dutch means "my way."

The eigenweg™ system is a product of Concord University research and development team Dr. W.R. Winfrey, professor of mathematics, and Miranda N. Martin, a recent Concord graduate. Their work is based in the Rahall Technology Center on the Athens campus.

According to Winfrey, eigenweg™ is a solution to fundamental problems in the tourism industry, such as connecting brochures to digital sources of information about tourist attractions. The system, which also has expanded into the business sector, bridges printed materials about a tourist attraction or business with their website via a QR code printed on any marketing piece that is easily read by a scanner in a kiosk or on a smartphone.

By creating a unique code for a subscriber, the system provides a digital link to information about that company. Once scanned, the code takes the user to eigenweg™'s system, which provides the user with a highly interactive, virtual look inside the company. The user can browse videos, virtual tours, GPS mapping, websites, real time updates on promotions and events, and any other media or information the company wants to provide.

Pictured: Miranda N. Martin scans a QR code on a tourism brochure to demonstrate the eigenweg™ system.

SHEPHERD STUDENTS COMPETE IN ROBOTICS COMPETITION

Members of the Shepherd University Robotics Club took second place at the recent Abington Regional Firefighting Robot Contest.

Shepherd students entered three teams in the senior division of the competition. The object of the competition, which included a total of 56 robots from schools across the Northeast and Mid-Atlantic regions, was to create a robot that could find the fire in the maze and extinguish it.

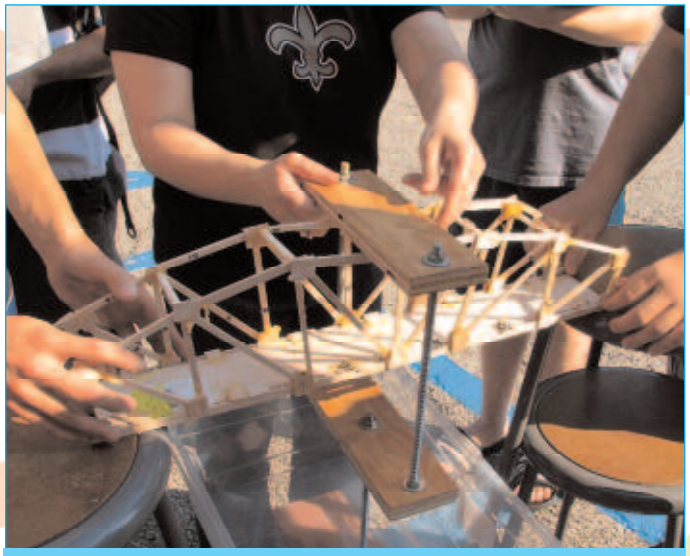
This is the second time that the club has participated in the competition, but it was the first time that they took home an award.

The winning "Neptune" team was made up of Caleb Rice, of Kearneysville; Andy Bungard, of Sistersville; Elod Bartos, of Washington, D.C.; Jeffery Carter, of Shepherdstown; and Michael Skaggs, of Arnoldsville.

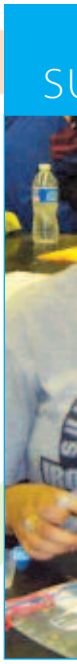
Visit the Shepherd Robotics Club online at **http://suroc.cmeshepherd.com/**.

A SUMMER OF STEM ACTIVITIES ACROSS TH

MARSHALL UNIVERSITY – ENGINEERING ACADEMY



WEST VIRGINIA UNIVERSITY INSTITUTE OF TECHNOLOGY – CAMP STEM



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MARSHALL UNIVERSITY – HARLESS CENTER STEM CAMP

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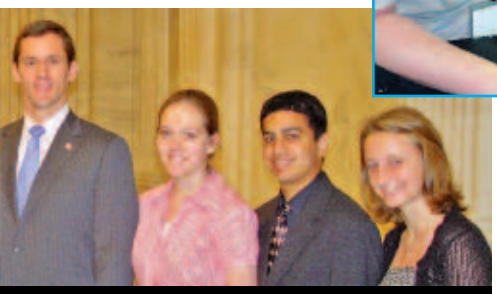
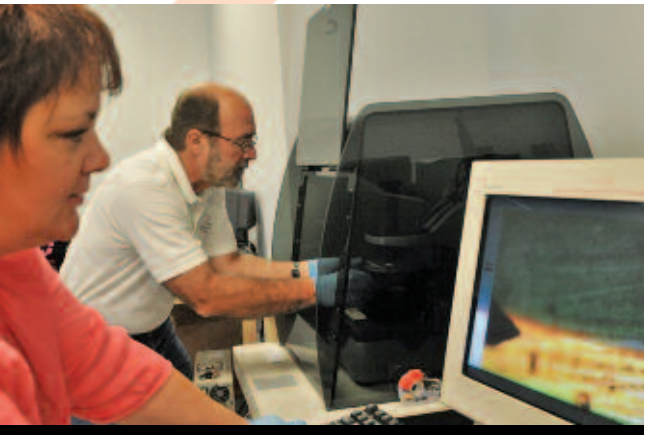
IE MOUNTAIN STATE

For young learners, high school students and graduates, and even teachers, this summer was chock-full of opportunities to engage in science, technology, engineering and mathematics (STEM). Here are highlights of just a few of them…

WVNANO – UMMER SCIENCE DAY CAMP



SCIENCE CAMP



VEST VIRGINIA UNIVERSITY – RCH EXPERIENCE FOR TEACHERS

Marshall University – Harless Center STEM Camp
Marshall's June Harless Center for Rural Education and Research Development held six summer camps designed to encourage curiosity and promote learning in a fun STEM environment. The camps were geared for students in grades three through nine, and took place at Kellogg Elementary School in Huntington. Students solved a weeklong mystery using forensic skills, programmed LEGO robots to complete missions and raced to save an island from volcanic eruption.

WVNano – Summer Science Day Camp
WVNano hosted a five-day camp for local middle school students on the West Virginia University campus in Morgantown. Sponsored in part by EPSCoR, the camp focused on the fun science of things that can be thousands of times smaller than the diameter of a human hair or larger than the sun. Students investigated kitchen chemicals, examined crime scene evidence and learned how to launch rockets.

National Youth Science Camp
This intense, month-long science camp challenged recent high school graduates from across the country in exciting lectures, hands-on studies and outdoor adventures. Made possible through the National Youth Science Foundation, the camp was held at Camp Pocahontas near the National Radio Astronomy Observatory. This year's student delegates included six from West Virginia (pictured here with U.S. Senators Jay Rockefeller and Carte Goodwin during their visit to Capitol Hill).

Marshall University – Engineering Academy
Thirty-six students from 23 high schools in six states participated in the annual "Exploring Engineering: Academy of Excellence" camp on the Marshall University campus in Huntington. Students were selected for the camp based upon their interest in and aptitude for engineering.

West Virginia University Institute of Technology – Camp STEM
The WVU Institute of Technology in Montgomery welcomed high school students from around the state for the week-long Camp STEM, which offered experiments, detailed lectures, field trips and a taste of college life. The camp is intended to encourage students to pursue rising STEM careers and engage them with students from across West Virginia.

West Virginia University – Research Experience for Teachers
Supported by the National Science Foundation and co-sponsored by the WVU College of Engineering and Mineral Resources, WVU College of Human Resources and Education and The EdVenture Group, this six-week experience gave high school STEM teachers from West Virginia and the surrounding region the opportunity to participate in hands-on research in energy and environmental topics.

CSX PRESENTS $50,000 GIFT TO MARSHALL THROUGH BUCKS FOR BRAINS PROGRAM

Pictured: from left, Lance West, vice president for development at Marshall University; Stephen J. Kopp, president of Marshall University; J. Randolph Cheetham, CSX regional vice president for state relations; U.S. Congressman Nick J. Rahall II; and State Senator Bob Plymale, director and CEO of the Nick J. Rahall II Appalachian Transportation Institute.

Photo – Rick Haye, Marshall University

CSX Corporation recently presented a gift of $50,000 to Marshall University for research at the university's Nick J. Rahall II Appalachian Transportation Institute (RTI). U.S. Congressman Nick Rahall and Marshall officials accepted the check from J. Randolph Cheetham, CSX regional vice president for state relations, in a ceremony in conjunction with the National Rural Intelligent Transportation Systems Conference.

The donation will be matched through the state's "Bucks for Brains" Research Trust Fund.

"CSX is pleased to work closely with Marshall University's Rahall Transportation Institute on a variety of important transportation research initiatives," said Cheetham. "Our contribution is meant to recognize that work and, with the matching grant from the research trust fund, position the institute for continued initiatives that will help the railroad industry continue its role as the safest, most efficient form of surface transportation."

The contribution will be used to further transportation research conducted by RTI through its Railroad Safety and Operations Research Center of Excellence (Rail-SORCE). The center was formed to enhance the study of technologies that address railroad industry challenges nationwide. The Rail-SORCE at RTI provides an array of services, including technology testing, research and development for asset mapping and inspections; train, car and mobile worker tracking; and intelligent grade crossings.

This is the second donation CSX has made to Marshall. The company made a $50,000 contribution last year for transportation research at RTI. That gift also was matched by the trust fund.

Dr. Stephen J. Kopp, president of Marshall University, thanked the company for the donation, saying, "Once again, CSX has demonstrated their support for the Rahall Transportation Institute, Marshall University and our community. This latest gift complements the significant investments made in transportation research at Marshall over the past several years, and we thank CSX for their continuing commitment. We also salute Congressman Rahall for his unwavering dedication and support of our university and this entire region."

WEST VIRGINIA STATE UNIVERSITY WELCOMES GENOMICS EXPERT FOR WEEKLONG WORKSHOP

West Virginia State University Agricultural and Environmental Research Station (WVSU AERS) recently purchased an epiflorescent microscope system with automated karyotyping software to be used for Fluorescent in situ Hybridization (FISH) in the genomics lab headed by Drs. Padma Nimmakayala and Umesh Reddy.

FISH is a technique that deals with the hybridization of a florescent DNA probe directly to the chromosomes. The goal is to localize genes or the DNA probe onto the chromosomes. The FISH process tells exactly where genes are located on chromosomes being examined. This can be useful for determining if organisms have a particular gene present and/or if that gene is being expressed under a given set of conditions.

Along with purchase of the microscope system, WVSU was able to bring the pioneer of the FISH technique, Dr. Nurul Islam-Faridi, to campus for a weeklong workshop with graduate and undergraduate research students.

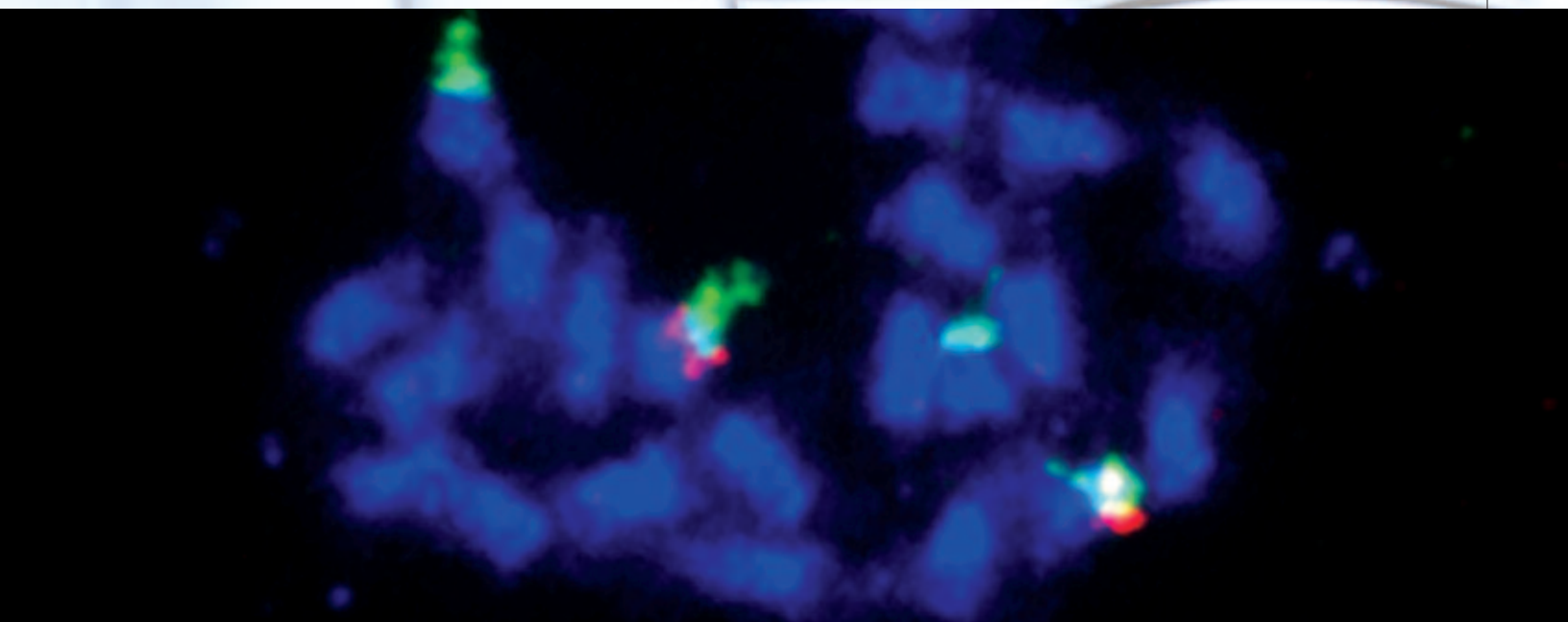
Dr. Faridi has been working in the FISH research technique since 1977. He completed his Ph.D. at Cambridge University, England, and is currently a research geneticist at the U.S. Forest Service Southern Research Station at Texas A&M University. Faridi established one of the best FISH research labs in the country at Texas A&M.

WVSU AERS has been working for more than a year to obtain results through the FISH research method. Dr. Faridi has been conducting the FISH method for 30 years and was brought to WVSU to offer assistance and ensure results. Faridi went over each of the 30 steps that make up the FISH technique process during workshop.

"It's an artsy science," said Faridi. "It takes dedication, perseverance, and much patience. Like a mother nurturing her newborn child, the FISH method takes constant interaction between the scientist and samples."

Faridi said that he considered WVSU's new FISH microscope system, which was supported by the 2006 EPSCoR Research Infrastructure Improvement award, one of the best in the country.

Pictured: Dr. Nurul Islam Faridi prepares a slide for examination during a FISH research workshop at WVSU.



NEWS AND ANNOUNCEMENTS

WVU PHYSICS PROFESSOR RECEIVES NSF GRANT TO IMPROVE COMMUNICATION TECHNOLOGY

Dr. Sergei Urazhdin, assistant professor in the Department of Physics at West Virginia University, has received a three-year National Science Foundation award valued at nearly $341,000 to conduct research on the scientific potential of miniaturizing communications devices and making them more energy efficient. This extends research supported by the NSF CAREER grant Urazhdin, who came to WVU through an EPSCoR Research Infrastructure Improvement award, received in 2007.

MARSHALL MATH PROFESSOR WINS "CHAIR" AWARD

Dr. Karen Mitchell, a mathematics professor at Marshall University, recently won the prestigious "Chair" award from the West Virginia Council of Teachers and Mathematics. The "Chair"is the organization's most distinguished service award and is bestowed upon a member who has consistently served the organization and mathematics community of West Virginia.

GLENVILLE STATE COLLEGE TRAINING LEADS TO OPPORTUNITIES

Melinda Woods Carpenter, an 8th grade science teacher at Summersville Middle School, and Sarah Mullins, an 8th grader at Ritchie County Middle School, have been selected as National Teacher and Student Argonauts and will participate in a two-year internship with The JASON Project, a nonprofit subsidiary of the National Geographic Society. Carpenter is one of the 110 West Virginia teachers who have received JASON training at Glenville State College, and Mullins is one of more than 4,000 students who have been exposed to JASON curriculum by these teachers. More information – **www.jason.org**

MARSHALL TO CONDUCT WIND ANALYSIS ON SURFACE-MINED LANDS

Marshall University's Center for Environmental, Geotechnical and Applied Sciences and the West Virginia Brownfields Assistance Center are partnering with the West Virginia Division of Energy Office of Coalfield Community Development to perform research and provide project administration for wind analysis on surface-mined properties in the state. The goal is to evaluate wind resources for energy development.

PHYSICS PROFESSORS RECEIVE GRANT TO STUDY A MISSING LINK IN THE EVOLUTION OF PULSARS

Drs. Duncan Lorimer and Maura McLaughlin, assistant professors in the Department of Physics at WVU, have won a $46,089 grant from the Smithsonian Astrophysical Observatory to study a missing link of creation in the lives of millisecond pulsars, the fastest spinning stars in space. More information – **http://astro.wvu.edu**

PRESIDENT OBAMA HONORS TWO WEST VIRGINIA TEACHERS

President Barack Obama recently named 103 teachers as recipients of the prestigious Presidential Award for Excellence in Mathematics and Science Teaching. Among the recipients were Cynthia Burke, a math teacher from Wheeling, and Rebecca Jones, a science teacher from Lumberport. They will receive a $10,000 award from the National Science Foundation, as well as a trip to Washington, D.C. for an awards ceremony and several days of educational and celebratory events, including visits with members of Congress and science agency leaders. More information – **www.paemst.org**

BIOTECH FIRM BEGINS CLINICAL TRIALS IN FRANCE

Protea Biosciences, a WVU spin-off company based in Morgantown, has begun conducting human clinical trials in France with European pharmaceutical manufacturer Mayoly Spindler. Together, they have developed a new recombinant Lipase, an enzyme that breaks down fats in food so they can be digested. They are testing the drug to ensure that it is safe and ready for market. Protea has exclusive rights to market the drug in North America. More information – **www.proteabio.com**

STUDY REVEALS JOB GROWTH DRIVEN BY STARTUPS

A new study by the Kauffman Foundation, "The Importance of Startups in Job Creation and Job Destruction," revealed that in their first year, new firms add an average of three million jobs. "These findings imply that America should be thinking differently about the standard employment policy paradigm," said Robert E. Litan, Vice President of Research and Policy at the Kauffman Foundation. "Policymakers tend to focus on changes in the national or state unemployment rate, or on layoffs by existing companies. But the data from this report suggest that growth would be best boosted by supporting startup firms." More information – **www.kauffman.org**

MARSHALL PRESENTS WORKSHOPS ON COMMERCIALIZATION AND INTELLECTUAL PROPERTY

The Marshall University Technology Transfer Office recently offered two workshops aimed at economic development. The two-part "Roadmap from Laboratory to Market," presented in part with TechConnect West Virginia, was aimed at helping scientists and engineers protect their intellectual property and identify their role in commercializing their discoveries, while tapping into a network of people who can help them.

WVU HOSTING EVENT FOR MINORITIES PURSUING DOCTORAL DEGREES

On October 3-5, WVU will hold the Colloquium for Aspiring Minority Doctoral Candidates, which is designed to promote graduate education at the university to prospective and current minority graduate students. The event will familiarize students with academic programs, admission standards and resources for funding graduate education at WVU. More information – **grad.wvu.edu/colloquium**

WEST VIRGINIA PUBLIC BROADCASTING

WEST VIRGINIA PUBLIC BROADCASTING FEATURES "INSPIRING WEST VIRGINIANS"

West Virginia EPSCoR is again teaming up with West Virginia Public Broadcasting to highlight science, technology and research initiatives in the state. This summer, WVPBS premiered the first episode in its "Inspiring West Virginians" series – a documentary profile of two of the world's leading climatologists, and native West Virginians, Lonnie Thompson and Ellen Mosley-Thompson. More information – **www.wvpubcast.org**

INTERESTED IN REVIEWING PROPOSALS?

Are you interested in serving as a reviewer for the West Virginia Higher Education Policy Commission's research grant programs? We are always looking for talented faculty with an eye for promising research in all STEM areas. For more information, contact Dr. Jan Taylor at jan.taylor@wvresearch.org

COMMENTARY

Dr. Curt Peterson
Vice President for Research and Economic Development at West Virginia University

AS RESEARCH INVESTMENTS INCREASE, SO DO ECONOMIC OPPORTUNITIES

West Virginia University netted a record amount of sponsored research dollars in FY 2010 to help researchers address issues of extreme importance to our state and nation. But, the story isn't just about numbers – it's about wide-ranging impact and making people's lives better.

Research funding climbed 18 percent in FY 2010, topping out at $175.3 million, an increase of more than $26 million from the previous year. This is due, in part, to institutional innovations to improve the quality of proposals; hard work by an energized faculty; agility in responding to competitive opportunities under the American Recovery and Reinvestment Act (ARRA); and the support of the late Senator Robert C. Byrd, Senator Jay Rockefeller and Congressman Alan B. Mollohan.

WVU's researchers are making vital discoveries, teaching young people about those discoveries and forging R&D and technology transfer initiatives that promote economic development. That discovery, engagement and innovation is what research is all about at the university level.

The sponsored research funded over the past year is wide-ranging:

- Ed Sabolsky of engineering received $299,950 from the U.S. Department of Energy (DOE) to develop nanoscale materials for tiny sensors that detect harmful gases.
- Duncan Lorimer and Maura McLaughlin of physics won $46,089 from the Smithsonian Astrophysical Observatory to study millisecond pulsars, the fastest spinning stars in space.
- WVU's School of Dentistry will examine oral diseases in children in Appalachia with a $2.8 million grant from the National Institutes of Health (NIH).
- Jonathan Boyd, through a Department of Defense (DOD) program, will help decrease the threat of cyber attacks with a $300,000 grant.
- Senator Byrd secured $4 million for WVU's Forensic Science Initiative research and training.
- Congressman Mollohan secured $4 million from the DOD to develop hybrid projectiles.
- Senator Rockefeller announced a $2.6 million National Science Foundation (NSF) EPSCoR award to strengthen cyberinfrastructure at WVU, Marshall University and West Virginia State University in collaboration with the University of Arkansas system.
- NIH awarded WVU computer scientist Lan Guo $1 million to improve survival rates for lung cancer patients whose tumors return.
- George O'Doherty, chemistry professor, won a $293,000 NIH grant to help create cancer drugs.
- WVU researchers are studying how to monitor underground storage for greenhouse gases with a $1.3 million DOE grant.
- A nuclear medicine imaging device that can give a 3D look at otherwise undetectable breast tumors earned WVU researchers $2 million from NIH.
- And Dr. Xiaodong Michael Shi, an assistant professor in the WVU C. Eugene Bennett Department of Chemistry who is featured in this edition of *The Neuron*, received a $550,000 NSF CAREER Award.

Those are just a few examples. In addition to the obvious impact the resulting advances will have, remember that there is a huge economic development benefit from the investment in university research. One recent study showed that WVU and its affiliates inject $40 into the state economy for every dollar invested in its work.

Recent national news stories noted that Morgantown's economic health is largely due to WVU's presence as a major employer, economic engine, health care hub, and powerful driver of research and intellectual property. Clearly, WVU research is making a difference on many levels. The university and its research faculty are proud of the work of the past year and energized for the year ahead.

For additional information about research efforts at WVU, go to: **http://research.wvu.edu/**.

FROM THE VICE CHANCELLOR: Fostering STEM and Economic Growth in West Virginia

As you'll see in this edition of *The Neuron,* this summer provided ample opportunities for students to engage in science, technology, engineering and mathematics (STEM) activities. From day camps and week-long experiences, to international trips and events for high school teachers, the summer months have encouraged STEM learning, which is critically important to West Virginia's economic growth and competitiveness.

These fields provide the underpinning for a stronger future. By creating both knowledge and innovation, we can help drive our state toward a knowledge-based economy. And when you couple STEM education with the burgeoning amount of scientific research dollars flowing to our universities, you have a solid recipe for building strong intellectual capital in West Virginia.

The Division of Science and Research and the EPSCoR program are committed to encouraging STEM education through initiatives like the STEM Fellows program, which helps recruit and support outstanding graduate students; the SURE Program, which helps colleges and universities provide Summer/Semester Research Experiences to undergraduates; and the Governor's School for Math and Science, which is supported by the West Virginia Department of Education and the Arts to provide residential summer science programs for middle school students.

Summer is certainly a great opportunity for creative STEM education, but we all know that more work begins as the fall semester commences. Encouraging STEM learning is a year-long, day-to-day effort. I applaud everyone who teaches in these fields, who learns in them, and who is helping our state to succeed in them.

Carpe Diem,

Paul L. Hill, Ph.D.
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