the NEURON

WEST VIRGINIA JOURNAL OF SCIENCE AND RESEARCH | WINTER **2010**

in this issue

West Virginia Higher Education Policy Commission

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On the Cover

ASTROPHYSICS AT SHEPHERD UNIVERSITY AIMS FOR THE SKIES

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

Contributions from Shepherd University

With Dr. Jason Best leading the charge, the Shepherd University Observatory is helping students reach new heights in their scientific ambitions. Construction of the observatory began in 2005 – the World Year of Physics – with funding from the state's Innovation Grants Program.

Perched atop the Robert C. Byrd Center for Legislative Studies, the observatory has provided many far-reaching opportunities for students, with projects and demonstrations in astronomy, physics and physical science courses.

"The observatory enhances classroom learning by providing field activities in a real-world scientific setting," says Dr. Best, professor of astronomy and astrophysics and observatory director. "The hands-on nature of observational work reinforces material learned in the courses and helps students to develop a fuller appreciation of the challenges and joys in scientific endeavors."

These students, like Ben Bisher, agree that the facility has enhanced their learning experiences. "Astronomy I and II were two of the best classes I have taken here at Shepherd. Using the observatory, I learned many things about space and had a lot of fun while doing it," Bisher said.

The observatory is home to a computerized Schmidt-Cassegrain telescope with a 14-inch diameter mirror, several research cameras used to acquire digitized images, a spectrograph for analysis of starlight, a pier to mount the telescope, and a 15-foot diameter dome that permanently houses all of this equipment. A number of smaller telescopes also are housed in the observatory.

This scientific equipment leads to promising research opportunities for the university and its students.

"The new instrumentation in the observatory creates on-site observational research opportunities for our students that were not possible before," says Dr. Best. "Numerous projects have been presented and published by a number of our undergraduate students, which is very satisfying to see."

Senior Adam McBride adds, "We have an opportunity to make real scientific contributions right here from campus."

In addition to the boosts in undergraduate coursework and research, the observatory also serves as a remarkable community outreach and K-12 educational tool – hosting activities such as the annual Washington Gateway Junior High Academy.

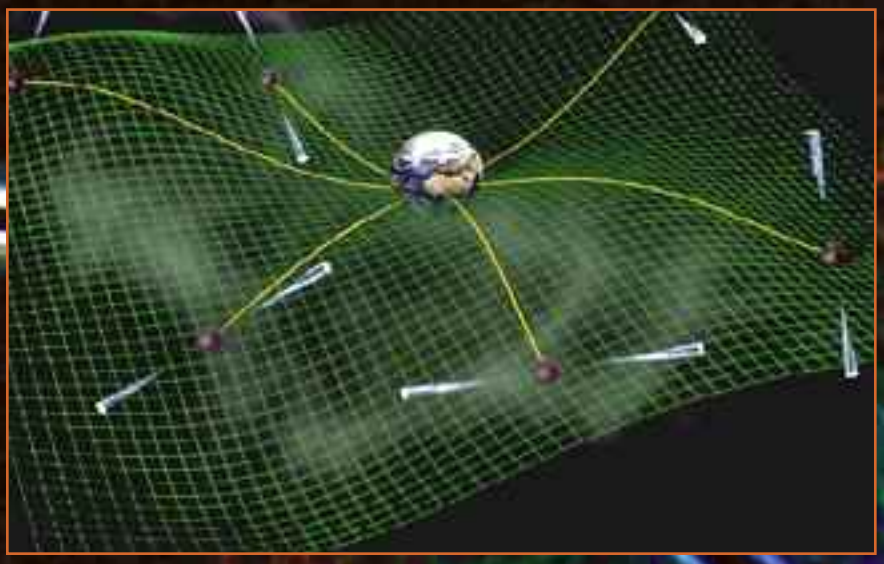
"Science is a public enterprise in the United States, now more than ever," says Dr. Best. "By extending access to K-12 students and others, we hope to maintain the public's appreciation for science, while reinforcing the importance of scientific endeavors to the general public."

For additional information on the observatory, visit: **www.shepherd.edu/astronomy/**

Photo Courtesy of Shepherd University Office of External Affairs

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**.



GROWING ACHIEVEMENTS AND ACCLAIM FOR WVU PHYSICS DEPARTMENT

As West Virginia University's Department of Physics gears up for the 2011 opening of its home in a newly-renovated White Hall, it continues to transform into a nationally-respected hub of research and achievement.

Take assistant professor of physics Maura McLaughlin, for example, who was part of a team of researchers that recently discovered 17 new millisecond pulsars through radio searches of unidentified gamma-ray sources found with the Large Area Telescope onboard NASA's Fermi Gamma-ray Space Telescope satellite.

Scientists on the Large Area Telescope team have been working to identify sources of gamma rays and produce a complete catalog from the first year of observations, consisting of more than 1,000 sources.

"We picked 50 sources that had gamma-ray properties similar to those of radio pulsars and observed those sources with the Green Bank Telescope. We are less than half-way through our search and have already found five new millisecond pulsars," McLaughlin said. "It typically takes a year of blind searching to find this many."

Professor of Physics Mark Koepke also is lending to the department's growing reputation, becoming the recognized scientific authority in curiosity-driven plasma science within the U.S. Department of Energy's Office of Fusion Energy Sciences, in Germantown, Md., where he began a two-year appointment last summer.

Recently, he was assigned to coordinate the development and execution of a strategic scientific plan for research on the properties of plasma across a wide range of physical conditions.

"Plasma is a dynamically rich and technologically potent state of matter, beyond solid, liquid, and gas," Koepke explained. "Fusion is the nuclear process of joining two atomic nuclei to deliver energy and it is considered environmentally superior to fission – the conventional energy-producing process used in today's nuclear power plants. But so far, it hasn't been used in a commercial reactor."

The plasma physics group in the WVU Department of Physics in the Eberly College of Arts and Sciences began in 1987 when Koepke arrived in Morgantown. Today, the group consists of five additional professors, one research associate and more than a dozen graduate and undergraduate students.

SCIENCE TECHNOLOGY ENGINEERING and MATHEMATICS

STEM: Education for the future

Across West Virginia, there are growing opportunities to gain enhanced learning in STEM fields.

National Lab Day

The Division of Science and Research is encouraging scientists, engineers, educators and other volunteers to inspire a new generation of innovators by participating in the White House's National Lab Day initiative, a grassroots movement to improve labs and create fun, hands-on, science-based learning for students in grades 6-12. Through the Web site - **http://www.nationallabday.org/** - school projects across the country and here in West Virginia are matched with volunteers and resources. In the first week of May, this collaboration will be celebrated with National Lab Day activities nationwide.

Storm tracker in Glenville

Recently, Glenville State College teamed up with the JASON Project, a non-profit subsidiary of the National Geographic Society, to deliver science curriculum and professional development to local 5th through 8th grade science teachers. Jason Dunion, a scientist who flies hurricane hunter aircraft directly into monster storms, paid a visit to the college to highlight this project, which aims to inspire and motivate students to learn science.

After visiting schools in Gilmer, Braxton and Nicholas Counties, representatives of the JASON Project gave a full presentation before more than 530 local teachers and students at the college. The next phase of curriculum, inspired by this project and focused on geology, is in the works.

"The JASON Project has made science so accessible for these classrooms, and I am proud of all the work that has been put into the program thus far," said Jessica Dorr, Glenville State College's JASON Project Science Coordinator.

Research Experience for Teachers

High school teachers from West Virginia and the surrounding region will participate in hands-on research in energy and environmental topics at West Virginia University in a new program, which starts this summer and includes a 10-day trip to England.

Funded by the National Science Foundation, the six-week Research Experience for Teachers program is co-sponsored by the WVU College of Engineering and Mineral Resources, WVU College of Human Resources and Education, and The EdVenture Group.

"Engaging teachers in hands-on research will help them, in turn, engage and motivate their students to pursue science and engineering degrees and technology careers"

Darran Cairns
assistant professor of mechanical and aerospace engineering and director of the project

RESEARCH AT MARSHALL UNIVERSITY MAY LEAD TO NEW WAYS TO TRANSPORT AND MANIPULATE MOLECULES

A group of Marshall University researchers and their colleagues in Japan are conducting research that may lead to new ways to move or position single molecules – a necessary step if man hopes to someday build molecular machines or other devices capable of working at very small scales.

Dr. Eric Blough, a member of the research team and an associate professor in Marshall University's Department of Biological Sciences, said his group – whose work was published in a recent issue of the research journal *Small* – has shown how bionanomotors can be used some day to move and manipulate molecules at the nanoscale.

"Being able to manipulate a single molecule under controlled conditions is actually a pretty big challenge," said Blough. "It's not quite the same, but imagine trying to pick up a single sewing needle off the ground with a huge steam shovel, and doing it so that you pick up the needle and nothing else. Or, to put it another way – how do you manipulate something that is very tiny with something that is very big? We decided to try and get around this problem by seeing if it was possible to use single molecules to move other single molecules."

Blough describes bionanomotors as naturally occurring tiny "machines" that convert chemical energy directly into mechanical work. A nanometer is about 1/100,000 the width of a human hair. A nanomotor is similarly sized and operates at the smallest of small scales.

"Our muscles are living proof of how bionanomotors can be harnessed to do useful work," he added.

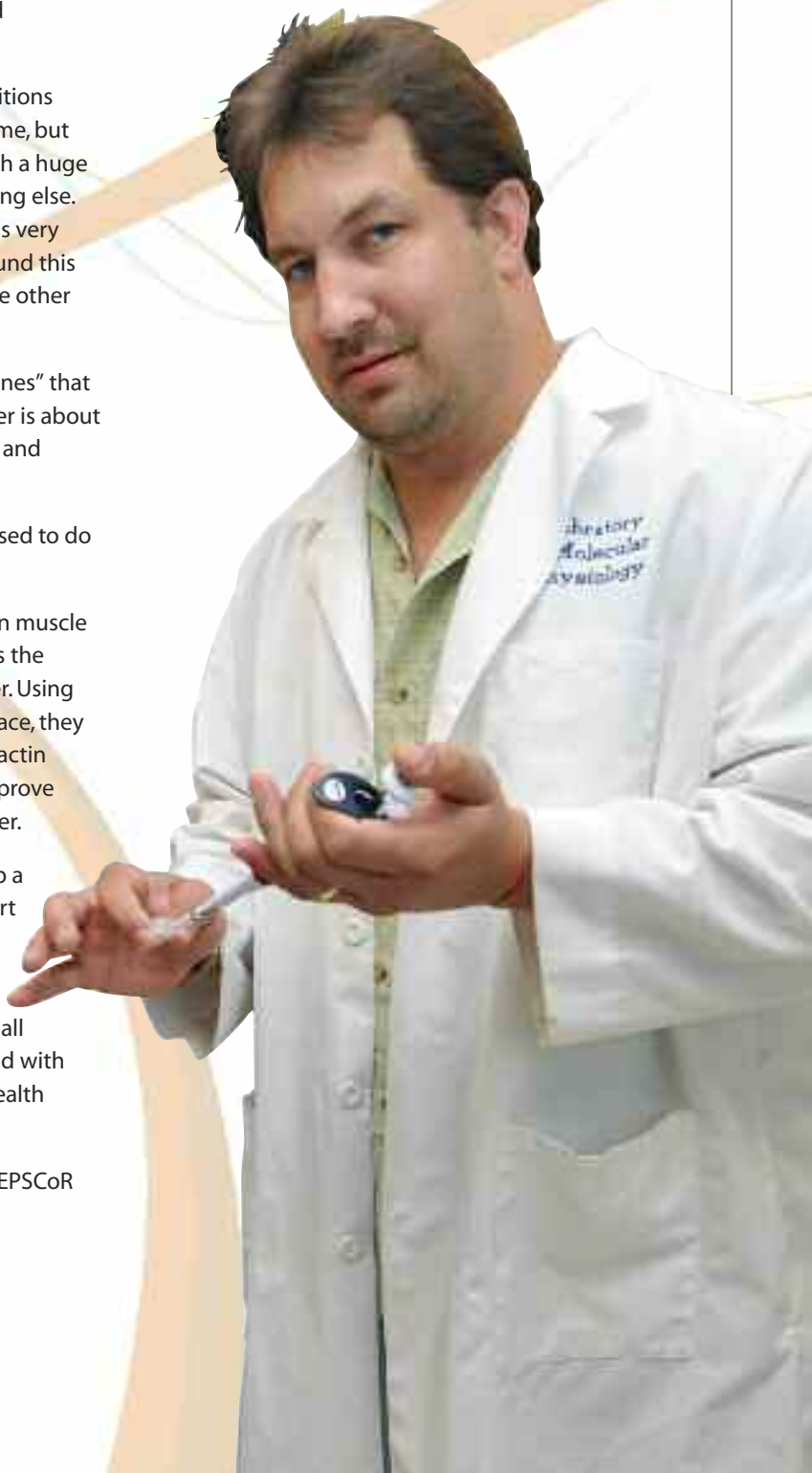
In the lab, Blough and his colleagues used myosin, a protein found in muscle that is responsible for generating the force of muscle contraction, as the motor; and actin, another protein isolated from muscle, as the carrier. Using a technique to make a pattern of active myosin molecules on a surface, they showed how cargo – they used small beads – could be attached to actin filaments and moved from one part of the surface to another. To improve the system, they also used actin filaments they had bundled together.

According to Blough, the long-range goal of their work is to develop a platform for the development of a wide range of nanoscale transport and sensing applications in the biomedical field.

"The promise of nanotechnology is immense," he said. "Someday it might be possible to perform diagnostic tests using incredibly small amounts of sample that can be run in a very short period of time and with a high degree of accuracy. The implications for improving human health are incredible."

Blough was recruited to Marshall with the support of the 2002 NSF EPSCoR Research Infrastructure Improvement (RII) grant.

Photo Courtesy of Marshall University



BIOTECHNOLOGY GRADUATES:

Where are they now?

Karen Thomas, West Virginia State University

West Virginia State University's Master's Degree Program in Biotechnology provides a unique experience for students. Emphasizing the skills a 21st century biologist needs, they learn state of the art biotechnology and use acquired techniques to conduct research addressing environmental, agricultural and biomedical issues.

Students finish prepared for diverse careers in biotechnology, pharmaceuticals, environmental sciences, health care and education. In the first five years, the program has graduated 20 students who are going on to great things. Here are updates on three of them:

Charles Pomeroy

A December 2009 graduate, he worked as a graduate research assistant for Dr. Jonathon Eya at WVSU, and is currently a research technician in Dr. Eya's lab on projects involving the use of rainbow trout and channel catfish gene expression and biochemistry as selection tools for improved growth performance. Chuck is interested in working for a federal agency in the future, addressing issues involving aquaculture, biodiversity and conservation, entomology or ecology.

Jeremy Sission

After receiving his degree in the spring of 2008, he accepted a research technician position under Associate Research Professor Dr. Barbara Liedl at WVSU. He currently works on several projects in the areas of greenhouse tomato breeding and alternative agriculture in Dr. Liedl's lab. Jeremy is interested in working for the federal government as a research scientist, pursuing applied projects that lead to dissemination of knowledge for the purpose of helping people and benefiting the environment.

Tandie Mpabanga

An international student from Zimbabwe who values the prospect of helping to better a community through scientific developments, she transferred to WVSU in 2004. After joining the Environmental Microbiology Laboratory of Dr. David Huber at WVSU, she received her Master of Science degree in Biotechnology in December 2008. She is currently working in Dr. Huber's lab on several projects, including expansion of her thesis work. Tandie states that she has a profound appreciation for microbial ecology and how we can apply this knowledge to improve not just human but all animal and plant life as a whole.

Photos Courtesy West Virginia State University

Biometrics researchers at West Virginia University's Center for Identification Technology Research (CITeR) and scientists working at the Marshall University Forensic Science Center have something in common: their work yields real-world results that can safeguard people and communities.

But translating research into results is a challenge many researchers face. In the world of biometrics – the science of recognizing humans based on physical or behavioral traits – this transition is especially critical, as researchers are developing systems that government agencies can use in law enforcement, national security and defense.

BIOMETRICS AND FORENSICS START IN THE LAB, MAKE A DIFFERENCE IN THE COMMUNITY

To facilitate that transition, the U.S. Department of Justice awarded a $1 million grant that will be used by CITeR to create the Transition Readiness Assessment Center – which will help translate the technologies researchers are developing into systems agencies can use.

Dr. Larry Hornak, lead researcher on the project and founding and current co-director of CITeR, said, "The end result will be a seamless collaboration across academic, government, and industry, and therefore increased efficiency in transitioning these technologies into systems that serve the national interest."

At Marshall University, the Forensic Science Center is the host site of a National Institute of Justice program that made it possible to work with three metropolitan areas testing DNA evidence at crime scenes.

Marshall's lab is helping solve crimes in Huntington, W.Va., Miami, Fla. and Charleston, S.C., where 100 crimes solved have led to 20 arrests. They have processed 600 DNA samples in the last two years, and their work is quick and accurate – which is crucial, according to Terry Fenger, Ph.D. director of the Forensic Science Center.

"Many times individuals who commit these crimes are transient," said Fenger. "It would be nice to identify these individuals prior to them leaving a geographical area."

To learn more about this work, visit: **www.citer.wvu.edu; forensics.marshall.edu**

Top Photo Courtesy West Virginia University
Bottom Photo Courtesy Steve Shaluta, West Virginia Department of Commerce

RESEARCH TRUST FUND

Institution	Amount	Principal Investigator
Concord University	$100,000	President Gregory Aloia
West Liberty University	$100,000	President Robin Capehart

INSTRUMENTATION GRANTS

Institution	Amount	Principal Investigator
Glenville State College	$19,980	Dr. Sara Sawyer
Wheeling Jesuit University	$16,988	Dr. Andy Cook
West Virginia Wesleyan College	$20,000	Dr. Jeanne Sullivan
West Virginia University Institute of Technology	$19,909	Dr. Nan Wang

INNOVATION GRANTS

Institution	Amount	Principal Investigator
Shepherd University	$40,000	Dr. Jeffrey Groff
West Virginia Wesleyan College	$40,000	Dr. Timothy Troyer

GOVERNOR'S SCHOOL FOR MATH AND SCIENCE

Institution	Amount	Principal Investigator
National Youth Science Foundation	$115,000	Dr. Andy Blackwood
West Virginia University	$115,000	Dr. Keith Garbutt

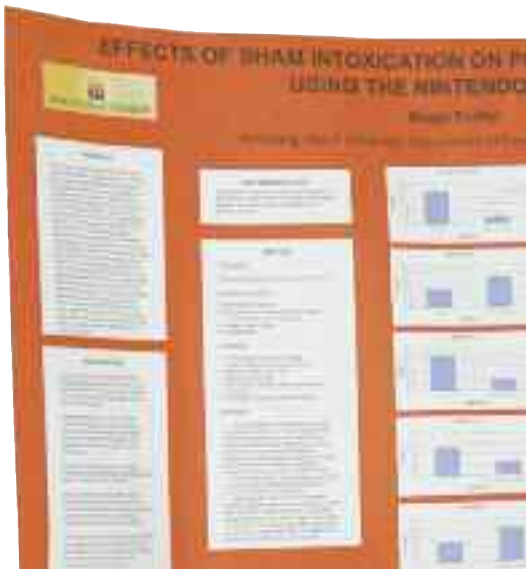
WV-INBRE (IDeA Network of Biomedical Research Excellence)

Institution	Amount	Principal Investigator
Alderson-Broaddus College	$125,000 per year for three years	Dr. Yi Chen
West Liberty University	$125,000 per year for three years	Dr. Jarrett S. Aguilar
West Virginia State University	$125,000 per year for three years	Dr. Rob Harris
West Liberty University	$125,000 per year for three years	Dr. Robert Kreisberg
Wheeling Jesuit University	$125,000 per year for three years	Dr. Robert Shurina
Alderson-Broaddus College	$25,000	Dr. Haitao Luo
Bethany College	$12,500	Dr. Dan Phillips
Bluefield State College	$75,000	Dr. Tesfaye Belay
Concord University	$25,000	Dr. Darrell Crick
University of Charleston	$10,000	Dr. Rebecca Linger
University of Charleston	$12,000	Dr. Michelle Herdman
University of Charleston	$12,750	Dr. Shawn Jones
University of Charleston	$14,052	Dr. Gagan Kaushal
University of Charleston	$15,000	Dr. Dean Reardon
University of Charleston	$15,000	Dr. Aladin Siddig
West Virginia State University	$14,596	Dr. Gerald Hankins
West Virginia Wesleyan College	$28,845	Dr. Melanie Sal
West Virginia Wesleyan College	$50,000	Drs. Timothy Troyer and Luke Huggins
West Virginia Wesleyan College	$50,000	Dr. Luke Huggins

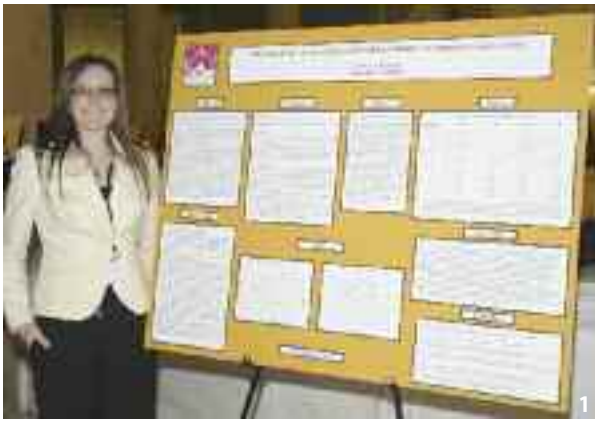
UNDERGRAD

January 28th marked the 7th annual Undergraduate Research Day at the State Capitol. Young research talent from across the state filled the upper halls – showcasing posters on research in areas from heart disease and post traumatic stress disorder, to rocket flight and political science. More than 100 college and university students from 13 West Virginia institutions were selected to present their discoveries.

An awards ceremony at the Culture Center was held in conjunction with Undergraduate Research Day, recognizing nearly $3 million in recent, competitively-funded state and federal grants to colleges and universities to advance scientific research across West Virginia. Governor Joe Manchin spoke at the ceremony, where Higher Education Policy Commission Chancellor Brian Noland joined West Virginia Secretary of Education and the Arts Kay Goodwin and Dr. Gary Rankin from Marshall University to present the awards listed here.



UATE RESEARCH DAY AT THE CAPITOL



1 Jessica McGuire, University of Charleston – Impact of Peer Influence and Social Desirability on Expressed Liking for a Target

2 John Barnard, West Virginia University – The Effect of Carbon Nanotube Exposure on Lysyl Oxidase Activity in Mouse Lung

3 Vanessa Rogers, Marshall University – Investigation into Eating Disorders as an Addiction

4 Megan Foutty, Wheeling Jesuit University – Effects of Sham Intoxication on Physical Performance using the Nintendo Wii Fit

5 Katie Gatian and McKenzie Ditty (Ryan Pekar not pictured), West Virginia University – Sloshing Control Using Electromagnetic Force in a Microgravity Environment

6 Desiree Marinus, Dara Boyte and Chris Cline, Shepherd University – Exploring a Chaotic Waterwheel Using the Lorenz Equations

7 Chad Pyles, Marshall University – A Spatial Analysis of Violent Crime and Alcohol in Huntington, W.Va.

Photos Courtesy of Martin Valent, West Virginia Legislature

U.S. AND CHINESE ENERGY TECHNOLOGISTS MEET AT WVU TO DISCUSS CLEAN COAL

Wu Guihui, engineer general of the National Energy Administration for the People's Republic of China

Some of the next steps in Chinese-United States cooperation in developing cleaner coal technologies were discussed recently at West Virginia University as some of the top players from both countries collaborated to share strategies and technologies at a workshop at the National Research Center for Coal and Energy.

Wu Guihui, engineer general of the National Energy Administration for the People's Republic of China and leader of the Chinese delegation, told an audience of about 125 that the workshop was an important step in following up on the recent meeting between President Hu Jintao and President Barack Obama. The workshop participants were the people who would be responsible for making changes to cleaner energy, he said.

Jerald Fletcher, a workshop organizer, WVU professor and director of the WVU US-China Energy Center, said, "It is incumbent on the U.S. and China as the world's largest users of coal to develop technologies to reduce the carbon footprint of this essential energy resource.

U.S. presenters included: Peabody Energy, CONSOL Energy, Baard Energy, Eastman Chemical Co., Quad3 Engineers, American Electric Power, Arizona Public Utilities, WVU, the National Energy Technology Laboratory, Lawrence Livermore National Laboratory, and the Department of Energy Office of Fossil Energy.

Chinese presenters included: the Shenhua Group, ENN, Lu' An, Yankuang Group Co., Ltd., and Shanxi Yanchang Petroleum Ltd., along with the China Academy of Sciences' Coal Chemistry Institute, Nanjing Institute, and Dalian Institute, the Thermal Power Research Institute, and the National Energy Administration for China.

Discussions focused on converting coal to liquids and to synthetic natural gas for transportation and electricity generation and capturing and storing carbon dioxide from these processes. While the technical challenges and the associated costs are quite high at the moment, many were optimistic that technologies would be developed to meet the challenges.

Photo Courtesy Steve Shaluta, West Virginia Department of Commerce

Dr. Nalini Santanam, associate professor of pharmacology, is shown in her lab at the Robert C. Byrd Biotechnology Science Center at Marshall University. She is working on a WV-INBRE project to discover biomarkers that could help identify people predisposed to heart disease.

MARSHALL UNIVERSITY AWARDED $3 MILLION FOR BIOMEDICAL RESEARCH

The National Institutes of Health (NIH) recently awarded five grants totaling $3 million to faculty members at Marshall University's Joan C. Edwards School of Medicine. The grants, awarded competitively through the American Recovery and Reinvestment Act of 2009, will support biomedical research and workforce development programs. Four of the funded projects are associated with the West Virginia-IDeA Network of Biomedical Research Excellence (WV-INBRE).

"These awards will allow more students and faculty members from the state's undergraduate institutions, as well as high school science educators, to participate in biomedical research projects and gain valuable skills and experience," said Dr. Gary Rankin, chairman of the university's Department of Pharmacology, Physiology and Toxicology and WV-INBRE principal investigator.

Identification of Potential Biomarkers for Cardiovascular Disease **$529,000**

Dr. Nalini Santanam — *associate professor of pharmacology;*
Dr. Ken Cushman — *West Liberty University, collaborator*

Goal: discover biomarkers that could help identify people predisposed to heart disease.

Prevention of Kidney Damage Caused By Anticancer Drug **$651,000**

Dr. Monica Valentovic — *professor of pharmacology, physiology and toxicology;*
Dr. Elaine Hardman — *associate professor of biochemistry and microbiology,*
Dr. Tim Troyer — *West Virginia Wesleyan College, collaborators*

Goal: evaluate methods for reducing the side effects of the widely-used cancer chemotherapy drug cisplatin.

Summer Research Experiences for Students and Science Educators **$751,000**

Goal: *support summer research interns at Marshall, West Virginia University and the state's undergraduate institutions.*

Research Workforce Development and Dissemination **$590,000**

Goal: *support undergraduate students and high school science teachers to work on WV-INBRE-funded projects in campus labs.*

Transcription Factors in Cancer **$490,000**

Dr. Richard Niles — *West Virginia University*

Goal: *set up a network between Marshall and West Virginia University's Mary Babb Randolph Cancer Center to help researchers study the genetic makeup of donated tumor material; use the information collected to create more customized prognoses and cancer treatments.*

NEWS AND ANNOUNCEMENTS

STAND-OUT STUDENTS

Breanna J. Henry, an industrial engineering major at West Virginia University, was awarded a $1,000 scholarship from the Society of American Military Engineers. Henry is a native of Hedgesville, W.Va., and is active in the University's Reserve Officers' Training Corps. She is currently serving as a flight commander for 15 freshman cadets, and is the treasurer for Silver Wings – an honorary service organization affiliated with Air Force ROTC.

Marshall University senior and integrated science and technology major Kathleen Brown has been selected to present a paper at the Experimental Biology 2010 meeting in Anaheim, Calif., in April. She works in the laboratory of Dr. Piyali Dasgupta, where research is primarily focused on the signaling mechanisms by which nicotine contributes to the growth of small cell lung cancer.

Katie Gatian, a native of Morgantown, spent last summer in Huntsville, Ala., while she participated in the inaugural NASA Propulsion Academy. There, spending 16 hours a day, the WVU aerospace and mechanical engineer senior built a thrust vector control desktop learning center for NASA. The summer experience was offered to WVU students through the West Virginia Space Grant Consortium.

THE SCIENCE OF SPEED

You can't win NASCAR races without getting the science right. The Science of Speed, an online series of videos produced for the National Science Foundation, explains the scientific principles that are essential to the NASCAR experience. Viewers learn how science makes cars powerful, agile, fast and safe – and how these same principles affect their own cars. This series uses the elements of NASCAR to show that a racecar really is a science experiment on wheels. University of Texas at Dallas physics professor, Diandra Leslie-Pelecky, hosts the series. Episodes can be found at: **http://www.nsf.gov/news/special_reports/sos/**

The **Division** of **Science** and **Research** is now on **Twitter**

Follow us at:
http://twitter.com/researchwv

Photo Courtesy Marshall University

ZATAR NAMED PCI EDUCATOR OF THE YEAR

Dr. Wael Zatar, associate professor of engineering at Marshall University, is the recipient of the 2009 Precast/Prestressed Concrete Institute (PCI) Young Educator Achievement Award. He received the prestigious national award during the 55th Annual Convention/Exhibition and PCI National Bridge Conference in San Antonio in September.

FEDERAL STIMULUS DOLLARS CONTINUE TO FUEL RESEARCH

With significant help from the American Recovery and Reinvestment Act of 2009, research across West Virginia's higher education institutions is amplifying – with the number of research awards reaching 64, and the amount climbing to nearly $29 million. Among these awards is the $3 million grant for biomedical research at Marshall University highlighted on page 11; a $1 million grant to WVU for the study of improving the five-year survival rate among those with a recurrence of lung cancer; and a $930,058 grant to Marshall for a new Confocal/ Multiphoton Microscope to advance cellular and physiological research.

WVU AND MARSHALL TEAM UP TO REHABILITATE BROWNFIELDS

West Virginia University and Marshall University are joining forces to help communities accross the Mountain State redevelop blighted former industrial sites known as brownfields. The two universities have been seeking communities that would like to apply for up to $5,000 in assistance to redevelop their brownfield sites under a program known as the Foundation for Overcoming Challenges and Utilizing Strengths (FOCUS) West Virginia Brownfields. For more information, visit: **www.wvbrownfields.com**

Photo Courtesy of West Virginia University

MIT GRAD NEW LEADER OF WVU CAFEE

Chris Atkinson is the new director of West Virginia University's Center for Alternative Fuels, Engines, and Emissions (CAFEE). He rejoined the WVU faculty as a professor of mechanical and aerospace engineering in the College of Engineering and Mineral Resources and CAFEE director. Although he is originally from South Africa and a graduate of the Massachusetts Institute of Technology (MIT), Atkinson is no stranger to West Virginia. He earned his master's degree in mechanical engineering at WVU before going on to MIT for doctoral studies. After completing his doctorate, he served on WVU's mechanical engineering faculty from 1991 to 2000. Last fall, after nearly a decade in the private sector, Atkinson returned to WVU to take on this new role.

MARSHALL JOINS INTERNET2

Marshall University recently announced it has joined Internet2®, an advanced networking consortium. Through its membership, the university's students, faculty and staff will have access to Internet2's premier, ultrafast nationwide network, which connects close to 70,000 research and educational institutions in the U.S. and interconnects with 80 international research networks worldwide. According to Marshall officials, participating directly in the Internet2 community and connecting to its advanced high-performance network provides the university transformative tools for learning and discovery, and supports research, education and healthcare throughout the region.

PROTEA BIOSCIENCES WINS NEW PATENT

Protea Biosciences, a developer of new technology for pharmaceutical research, has received a new U.S. patent for a novel protein separation technology. Issued on January 5, the patent is titled "gel electro-elution and sample separation devices and associated processes." In 2009, Protea launched a new protein recovery system, the GPR-800, which simultaneously recovers eight intact protein samples in less than 20 minutes. Current technologies require three to six hours per sample with lower efficiencies. The system employs proprietary single-use plastic microchips. Steve Turner, Protea's CEO, said: "Patents are the key assets of biotechnology, as they represent ownership in new technology and new knowledge. We are building a growing world-class life sciences company based upon our own scientific discoveries as represented by this latest U.S. patent, as well as those of our research collaborators at West Virginia University, Johns Hopkins, and George Washington University."

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

By Elizabeth Murray, Ph.D.
Associate Professor of Integrated Science and Technology, Marshall University

INNOVATIVE SCHOLARSHIP PROGRAM AIMED AT NONTRADITIONAL STUDENTS

The era of the nontraditional student has arrived. Today, many returning students are older and have families. The Huntington-Ashland WV-OH-KY Metropolitan Statistical Area has an abundance of untapped intellectual potential – only 16.2 percent of our adults 25 years or older have a bachelor's degree, compared to the national average of 27 percent.

We know that nontraditional students are more likely to stay in their communities to help build West Virginia's new science and technology economy. Unfortunately, scholarship opportunities for students with dependents are limited, even though their financial needs usually are higher. Nontraditional students often attend school part time, even though degree completion is improved with full-time attendance.

Our exciting, new National Science Foundation-funded Trailblazer Scholars program is a catalyst to begin tapping this intellectual potential.

These scholarships will support nontraditional students who have dependents and are interested in pursuing a degree in the fields of science, technology, engineering or mathematics at either Marshall University (MU) or Marshall Community and Technical College (MCTC). Trailblazer Scholars, who must demonstrate financial need to qualify, will receive annual scholarships up to $8,500 over and above their Pell Grant awards.

We are in the process of recruiting a cohort of 15 academically-talented students with dependents to pursue two- and four-year degrees in science and technology disciplines at the two institutions beginning this fall. Scholars can choose between entering MU directly or beginning at MCTC and transferring once they have earned an associate degree.

The dual degree programs included are bioscience (MCTC) and biotechnology (MU); information technology (MCTC) and computers and information technology (MU); and geospatial science (MCTC) and geography (MU). Students interested in other majors in the MU College of Science or the College of Information Technology and Engineering also will be supported.

> "Not only will the program improve educational opportunities and student services for nontraditional students, but it will also help expand the technical and science-based workforce in the region"

Trailblazer Scholars will have an opportunity to pursue a science and technology career that provides financial support, and also respects and includes the needs of their families. In turn, the scholars' families will be exposed to social networks, and science and technology knowledge.

By working with the scholars, our administrative team will learn which services and support systems are needed and will introduce sustainable programs to support nontraditional students' circumstances across the institutions. Ultimately, the program will blaze a new higher education framework that is pivotal to uplifting West Virginia's economy.

Not only will the program improve educational opportunities and student services for nontraditional students at both MU and MCTC, but it will also help expand the technical and science-based workforce in the region – a worthy goal indeed!

FROM THE VICE CHANCELLOR: Seeding the Future

Results-driven research starts with success-driven people. And fortunately, West Virginia is home to many talented and committed researchers - people who know discovery is within their grasp, and they work hard to reach it.

You will find some of these motivated people throughout this edition of *The Neuron* - like Dr. Maura McLaughlin at West Virginia University whose discoveries in astrophysics are mounting, and Dr. Eric Blough at Marshall University whose work in molecular physiology has earned journal recognition yet again. And check out Dr. Liz Murray at Marshall and Dr. Jason Best from Shepherd University and their work to energize our student workforce for a changing world.

These brilliant and grounded scientists know their work has the potential to break new ground - and seed the future at the same time.

Vibrant and far-reaching scientific research is being supported with federal dollars more strongly than ever before. Federal research dollars leveraged by EPSCoR and INBRE have more than doubled over the past five years and now exceed $92 million annually in West Virginia, topped by another $29 million in Recovery Act awards. And with state-backed programs funding new work and seeding new opportunities, we are seeing how hard work really does pay off.

Special thanks to some of the hardest-working people I've ever met! It is only with your effort and diligence that we are realizing such successful and supported research - work that is crucial to moving our lives forward, building our economy, and triggering further discoveries for generations to come.

Carpe Diem,

Paul L. Hill, Ph.D.
Vice Chancellor for Science and Research
West Virginia Higher Education Policy Commission

Science and Research Council

Division of Science and Research
West Virginia Higher Education Policy Commission
1018 Kanawha Blvd E Ste 1101
Charleston WV 25301-2800
voice 304.558.4128
FAX 304.558.2321
www.wvresearch.org

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