W E S T V I R G I N I A

Space Connections

A Quarterly Newsletter by NASA West Virginia Space Grant Consortium

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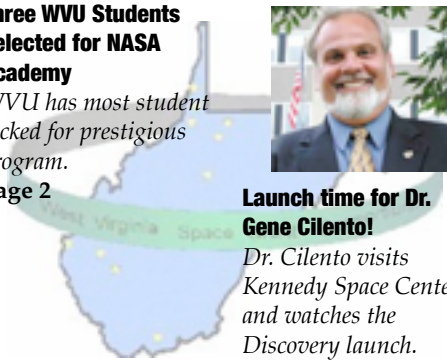


Letter From the Director

It's my pleasure to welcome you to another edition of WV Space Connections. Thanks to the dedication and hard work of our faculty, our affiliates, our Board Members, and our colleagues, Space Grant Consortium and EPSCoR continue to expand their coverage and services in West Virginia.

Over 20 students from West Virginia have started their summer internships at various NASA Centers and high technology companies in the State. For the first time, four of our students have been selected to participate in the NASA Academy program at Goddard Space Flight Center, Glenn Research Center and Ames Research Center. This is a testament to the quality of West Virginia students and their enthusiasm in participating in our nation's space program. We are very proud of our students and we're excited about the educational and career opportunities that this experience will provide for them. In other news, membership in our Board of Directors has gone through a few changes. Dr. Richard Prestage has left the directorship of the National Radio Observatory (NRAO) in Green Bank for a position with the ALMA telescope project in Chile. We appreciate his services to the Space Grant program and wish him much success in Chile. Dr. Karen O'Neil, head of program development, will represent the Green Bank facility on our Board until a replacement for Dr. Prestage is named by the NRAO.

Also, Dr. Anne Cavalier, representing WVU Institute of Technology has taken up a new career challenge with the Department of Commerce, Economic Development Administration (EDA). She is now serving as the Economic Development Representative for WV and MD. We are fortunate that she has agreed to continue to serve on our Board, representing the EDA. To fill her seat as the institutional representative from WVU IT, Professor Garth Thomas, Professor of Chemical Engineering, was appointed by the Provost of WVU IT to replace Dr. Cavalier. We welcome Garth to our Board and we are looking forward to many years of collaborations with him.

I wish all of our affiliate faculty and students a productive summer.

- Dr. Majid Jaraiedi

Curtis Groves at Johnson Space Center.

NASA Scholar and Intern Fulfills Childhood Dream

Curtis Groves turns a dream into a reality.

Ever since he was a child, NASA Scholar Curtis Groves wanted to work for NASA. That dream began to become a reality after he joined the Microgravity Research Team at WVU where he had the opportunity to design, build, and test microgravity research aircraft.

"Getting to work side by side with an advisor on a research project is a valuable experience," said Groves.

Groves went on to become an intern at the Kennedy Space Center. At KSC, he worked in the mechanical division of the space shuttle where he would model the orbiter to the external tank mate simulation. In addition to this experience, Groves was able to watch three space shuttle launches, landings, and a few Expendable Launch Vehicle launches. He also sat at the console during a shuttle launch, an Atlas V launch, and a Delta IV Launch.

Groves's experiences as a NASA Scholar lead him to his current job as a civil servant in the Launch Services Program Flight Analysis Division.

"I will go through a six month accelerated training program (ATP) where I will work in the aerodynamics discipline. I will be building an aerodynamic model of the Taurus launch vehicle," said Groves.

Groves's goals are to have a career with NASA, going back to school for a Masters and Ph.D. degrees, becoming a flight instructor, and working his way up to a Branch or Division Chief.

Groves is very grateful for the opportunities WVSG offered him. "The WV Space Grant office provides many opportunities for students to complete internships and research that would not be attainable without their help and financial support," said Groves.

Three WVU Student Selected for NASA Academy

WVU has most students picked for prestigious program.

Three students from West Virginia University will have the experience of a lifetime this summer as part of the NASA Academy, the nation's top internship program for the space program and aerospace industry.

Emily Calandrelli of Morgantown; Mehran Mohebbi, a native of Iran who is now a U.S. citizen; and Alan Talbott, of Walkersville, Md., will spend the summer conducting research under NASA scientists, working with students from around the nation and traveling to NASA centers for meetings and tours.

No other university this year had as many students chosen for the elite program as WVU, said Majid Jaraiedi, director of the NASA West Virginia Space Grant Consortium, which announced the selections recently.

"We are very proud to have three students selected for this program," said Jaraiedi, "and I am excited about the educational and career opportunities that this experience will provide for them."

Calandrelli, Mohebbi and Talbott are all mechanical and aerospace engineering majors at WVU. The students were selected on the basis of their grades, recommendations and applications.

"Students who have participated in this program say that the opportunities for learning and networking are just amazing," Calandrelli said. "They also say that the pace is intense and that we won't get much sleep. As an engineering major, I'm used to being busy, so that doesn't scare me."

Earlier this year, Calandrelli was selected as WVU's 19th Truman Scholar. She will graduate from WVU in 2010. The Truman Scholarship requires her to spend three years in government service after completing her education. Calandrelli has no doubt that she will complete that service by working for NASA.

She also plans to pursue graduate work in aeronautics/astronautics engineering and hopes to one day work on missions to Mars or to the moon as a NASA engineer. This summer, though, she will be working on a research project at NASA's Ames Research Center involving the development of advanced aerospace

Mehran Mohebbi, Emily Calandrelli and Alan Talbott will spend the summer conducting research under NASA scientists.

materials for rapidly emerging technologies.

After graduating from WVU in May 2009, Mohebbi hopes to attend graduate school in physics at Princeton or Cal Tech, and to pursue a career as a particle physicist. His dream job would be to work on an extremely large particle accelerator, which is currently under construction on the border of Switzerland and France, with scientists from around the world.

Talbott will not be far from his home this summer while participating in the NASA Academy at the Goddard Space Flight Center in Greenbelt, Md., but he doesn't expect to have much time to spend with friends and family.

He'll be too busy, he said, working on a project that involves analyzing data from one of NASA's geostationary satellites, which orbit the Earth at the same velocity as the planet's rotation, thereby constantly gathering data from a certain area.

"I want to work in the aerospace industry," Talbott said, "and to pursue graduate education. I am undecided as of yet about the exact order and manner in which I'll do those things."

All three are extremely excited and honored to have been selected.

"I felt very fortunate to be accepted into the program," said Mohebbi, "and I am excited for the opportunity."

NASA Hosts Forum at Kennedy Space Center

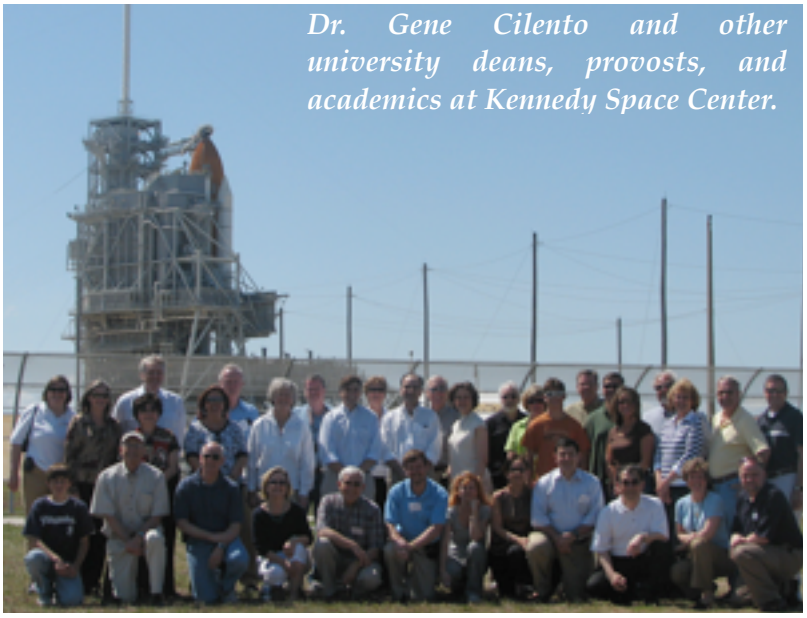
NASA recently hosted a forum at Kennedy Space Center entitled "A Dialogue Between University Leadership and NASA Education." The forum focused on enhancing NASA Education's relationships with colleges and universities, and to discuss how NASA and other federal agencies can better serve the needs of universities, students, and faculty.

The participants and guests discussed strategies to inspire tomorrow's generation of explorers and innovators, in addition to getting a behind-the-scenes tour of the Kennedy Space Center.

The forum schedule included a viewing of the Space Shuttle Discovery launch. The Discovery and its crew of seven astronauts were on a construction mission to the International Space Station.

The forum participants included Dr. Gene Cilento, Glen H. Hiner Dean, of West Virginia University, Rodney Erickson, V.P. and Provost of Penn State, David Hudson, Assoc. VP, Research of University of Virginia, Edward Sullivan, Associate Dean for Graduate Programs and Research, College of Engineering, California Polytechnic, and approximately 30 other participants.

Dr. Joyce Winterton, NASA's Assistant Administrator for Education, led the forum. Dr. Winterton directs the development and implementation of the agency's education programs that strengthen student involvement and public awareness of its scientific goals and missions.



Dr. Gene Cilento and other university deans, provosts, and academics at Kennedy Space Center.

NASA Space Grant and EPSCoR Award Recipients Announced

Congratulations to all the NASA Space Grant and EPSCoR award recipients: Dr. James Coffield, Dr. Hasan El-Rifai, Dr. Galen Hasan, Dr. Mario Perhinschi, Maria Babiuc-Hamilton, Tesfaye Belay, Giampiero Campa, Darcy Wayment, Edward Wovchko, Guo-Zhang Zhu, Jerry Carr, Meagan Hubbell, Darren Huckaby, Sheila Kazar, Jonathan Kweder, Richard Maxwell, Lance Walp, Sarah Kelly, Jennifer Napper, Amy Nash, Melinda Varney, Dr. Albert Popson, Dr. Hongwei Yu, Dr. Jack Byrd, Dr. Meri Cummings, Dr. Earl Scime, Deb Hemler, Elizabeth Strong, Dr. Robert Strong, Mohammed Ibrahim, Justin Morris, Kyle Allard, Robert Powell, Elizabeth DeFusco, Steven Hard, Charles W. Kling, Dominic Ludovici, Tristan McQuain, Nicholas Morris, David Narkevic, Sawan Prabhu, Christopher Evans, Jamar Grayson, Marvyn Grayson, Ashley Stewart, Dawn Stump, Casey Holliday, John Kuhlman, Trevor Stevens, Charter Stinespring, and Hongwei Yu. Congratulations!

A student raises her hand as Amanda Ansel discusses the Piedmont experiment she just performed on board the "Vomit Comet."

Out of This World Times at Clay Center

There have been many exciting space-related events at the Clay Center over the past few months and partnerships have played a key role.

The Center recently received a grant from the Bernard H. and Blanche E. Jacobson Foundation to purchase equipment and staff training which has enabled the Center to produce its own planetarium shows.

The first of these shows, The Moon: Past Present and Future, just finished its initial run. The show focused on Earth's closest neighbor in space, our moon. From theories on its formation to the space race to future lunar exploration, the show covered a multitude of lunar topics.

The Clay Center's current show, Space Oddities, presents a fascinating look at various astronomical phenomena such as comets, nebulae and black holes. These shows have proven very popular with the Center's school groups and general public.

A special program for middle and high school students also recently started at the Clay Center. The Green Bank Experience is a special program which educators can schedule when booking a school tour at the Center, and features a viewing of a DVD on the Center's giant screen dome about the National Radio Astronomy Observatory at Green Bank. This program is followed by a live uplink with the control room at Green Bank where students at the Clay Center can chat "face to face" via distance learning technology with an astronomer at Green Bank and learn about the many exciting projects happening at the facility. Teachers and students have given the program rave reviews so far.

Another benefit of the Green Bank – Clay Center partnership was programming surrounding the recent Phoenix Mars Lander mission.

NRAO Green Bank hosted a colloquium presented by Dr. Peter Illot of NASA's Jet Propulsion Laboratory on Thursday, May 22, just three days prior to the landing. In addition to the live audience at Green Bank, the Clay Center presented this lecture to an audience in Charleston via distance learning technology.

On Sunday evening, May 25, the Center once again partnered with Green Bank for a live discussion as astronomers and scientists at the facility monitored the landing of Phoenix. This program allowed the Clay Center audience to interact with the scientists and have a question and answer session both pre- and post-landing.

The Clay Center's ElectricSky Theater was packed with almost 200 participants for this Phoenix Lander program.

Finally, for the past year, the Clay Center has been partnering with our local NASA Explorer School, Piedmont Elementary. The school, just two blocks from the Center, has been communicating with NASA through the use of the Clay Center's video conferencing equipment.

Piedmont students created an experiment that their teachers, Amanda Ansel, Kim Landers and Becca Revercomb would ultimately perform on the "Vomit Comet" at the Johnson Space Center in Houston, TX. In this microgravity environment, as the plane on which the teachers rode climbed and plummeted in rapid succession, the teachers were able to perform experiments and discuss results with the class back in West Virginia at the Clay Center immediately after completion.

There are many exciting programs yet to come, so please check out the Clay Center the next time you are in the Charleston area and visit us online at www.theclaycenter.org. If you have an idea for a program or partnership opportunity or would like more information on programs available, please contact R. Lewis Ferguson, Director of Art and Science Education at (304) 561-3517 or lferguson@theclaycenter.org.

"The dinosaurs became extinct because they didn't have a space program. And if we become extinct because we don't have a space program, it'll serve us right!"

- Larry Niver

Nobel Laureate, John Nash, Headlines at Shepherd University

Princeton Graduate's Life Chronicled in 2001 film, "A Beautiful Mind."

If ever there were a person to sell to young people the idea of pursuing math-related research, it would be John F. Nash Jr., a Nobel Prize winner. Many know of Nash through the 2001 film about his life, "A Beautiful Mind." The film chronicled Nash's bout with mental illness and his groundbreaking research. Russell Crowe played Nash in the film.

Nash was the featured speaker at the East Coast Computer Algebra Day, held Saturday, May 10, at Shepherd University.

Number crunchers from across the East Coast converged at the National Conservation Training Center to talk math and discuss why more mathematicians should let computers do the heavy crunching.

The yearly conference serves as an incubator for computer algebra-related research and draws top-notch math whizzes from institutions all over the East Coast.

The free conference is held at a different place each year and is open to the general public. Shepherd University hosted the event at NCTC.

"We want to inspire young people to pursue a degree in math," said Reza Mirdamadi, chair of Shepherd University's department of computer science, mathematics and engineering.

Dr. Mirdamadi said Shepherd's math department used the conference as an opportunity to court would-be math, computer science and engineering majors.

During the conference, Shepherd students gave poster presentations on how computer-algebra systems are used, said organizer Suda Kunyosying, a longtime math professor with Shepherd's department of computer science, mathematics and engineering. Nash, 79, was born in Bluefield, W.Va., a small Appalachian town near West Virginia's southernmost tip.

"People've seen the movie, but they don't relate the movie to John Nash the person," Mirdamadi said.

In the math world, Nash's research laid the foundation for the economic concept of game theory. He was awarded the Nobel Prize in 1994 for his findings.

"We're lucky for him to say yes (to the invitation)," Kunyosying said. "We did not think he would come."

Nash speaking at Shepherd University's East Coast Computer Algebra Day.

From the left: Dr. John F. Nash (Princeton Univ.), Dr. Christopher W. Brown (US Naval Academy), Dr. Y. V. Ramana Reddy (WVU), Dr. Erich Kaltofen (NCSU), Dr. Mark Giesbrecht (University of Waterloo), Dr. Emil Volcheck (US Naval Academy).

Kunyosying said she hopes math teachers will use the conference as an opportunity to use computers as a way to teach math.

"It allows students to think outside the box," she said.

She gave the example of programming computers to detect numerical patterns.

"Say you're given a series - 1, 2, 4, 8 - what would the next number be?" Kunyosying asked. "16."

That's an easy one. Computer algebra comes into play when dealing with more complicated sets of numbers, she said.

For years, mathematicians have used computer programs to confirm groundbreaking theories. Kunyosying mentioned the first case, in which computer algebra proved the Four-Color Theorem was true.

The Four-Color Theorem holds that you only need four hues to color any map - or any flat image, such as a poster, broken into elements or regions - without giving regions with the same boundary the same color.

It sounds like a simple puzzle to solve, Kunyosying said, but for more than 100 years after the theorem was proposed in the 1850s, mathematicians from all over the world had been trying to prove - by hand - that the theorem was true.

It wasn't until the 1970s that researchers from the University of Illinois created a computer program that put conjecture to rest, proving once and for all that the theorem was true, Kunyosying said.

Letting computers do the grunt work - which could amount to pages of handwritten work - students are better able to focus on mathematical concepts and perhaps apply new concepts to other problems.

The computer doesn't do everything for the student, Kunyosying said.

"If you put in garbage, it will give you garbage back," she said. "You have to know what you are doing."

Think of computer algebra as a quality-control measure for mathematicians.

The other invited speakers were Erich Kaltofen of North Carolina State University, Y. V. Ramana Reddy of West Virginia University, and Paul S. Wang of Kent State University.

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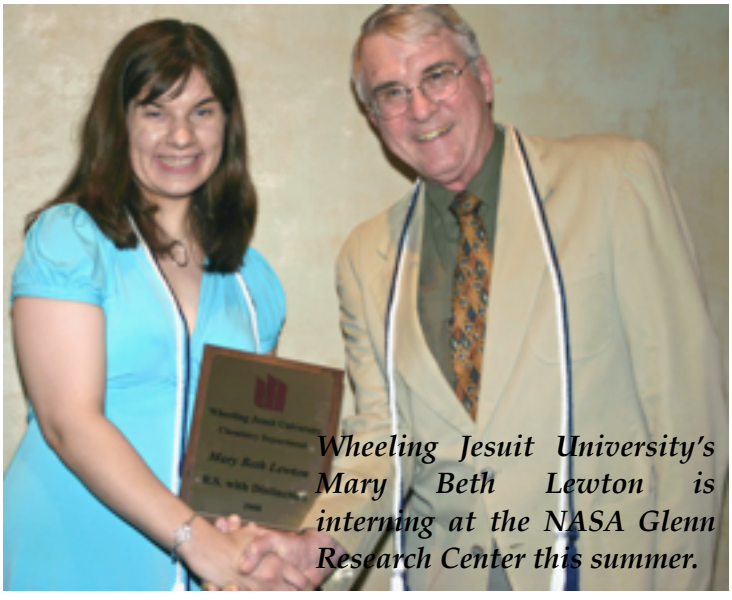
"The earth is the cradle of humankind, but one cannot live in the cradle forever."

—Konstantin Tsiolkovsky

Wheeling Jesuit University Graduate Mary Beth Lewton Interns at NASA

Graduating from college and moving on to an internship at NASA sounds like a good deal if you're a recent college graduate with a degree in chemistry and you're willing to skydive.

Wheeling Jesuit University graduate Mary Beth Lewton earned a chance to work for NASA this summer as an intern at the NASA Glenn Research Center in Cleveland, Ohio just after graduating summa cum laude in May 2008. As part of this opportunity, she took her first plunge from a plane in June. The skydive is just one of many aeronautic activities that NASA interns can take advantage of.



Wheeling Jesuit University's Mary Beth Lewton is interning at the NASA Glenn Research Center this summer.

Upcoming Events

July 10-11: West Liberty College will be hosting the Technology Integration in Earth and Space Science workshop at Brooke Hills Park.

July 28-August 1: "Students and Teachers Exploring Local landscapes to Interpret the Earth from Space" (SATELLITES) Summer Institute to be held at West Virginia University.

August 5-6: NASA Systems Engineering Workshop at Houston TX.

August 8-16: WV State Fair in Lewisburg, WV

September 7-10: Mid-Atlantic Regional Space Grant meeting at Johns Hopkins University Mt. Washington Conference Center.

September 13: LEGO Robotics Workshop at Wheeling Jesuit University.

October 25-27: National Space Grant Directors meeting in Atlanta, GA. Hosted by the Georgia Space Grant Consortium.

November 13-15: WVSTA LEGO Robotics Workshop in Morgantown.

December 13: West Virginia FIRST LEGO League Robotics Tournament at Wheeling Jesuit University.

The daughter of Jim and Mary Lou Lewton, Lewton is from North Ridgeville, Ohio, a Cleveland suburb. A chemistry major, she minored in professional communications and is uncertain what career she will ultimately pursue though she does know that it will continue at another Jesuit school, Georgetown University. Lewton was awarded a full scholarship with stipend to Georgetown, where she will major in chemistry for her Ph.D.

As a student at Wheeling Jesuit, Lewton was a NASA Space Grant scholar, served as vice president of the Campus Activities Board, and was on the dean's list for all four years. She was also involved in many community service activities and contributed articles to several university publications. While attending WJU and as a NASA Space Grant Scholar, she assisted Dr. Meri Cummings at the Center for Educational Technologies on campus with various laboratories, NASA education, and robotics tournament planning and coaching tasks.

Lewton's honors include Gamma Sigma Epsilon, Alpha Epsilon Delta, Sigma Lambda, Laut Honors Scholar, Gloriam Award for Service, Leadership and Academic Excellence. She also served as student secretary for WJU Information Technology Services; secretary of the Chemistry Club; a contributor to Jewelweed, WJU's literary magazine; staff writer for Cardinal Connection, the WJU student newspaper; and was a teaching assistant.

She has been working since the end of May on her internship at the NASA Academy, where selection was based on leadership skills. One of only 50 interns nationwide, she was selected from 2,000 applicants. Her research will be on lithium ion battery technology methods and procedures.

The Glenn Research Center partners with U.S. industry, universities, and other government institutions, to develop critical systems technologies and capabilities that address national priorities. Its world-class research, technology, and capability development efforts are keys to advancing exploration of our solar system and beyond while maintaining global leadership in aeronautics.

It's main campus is situated on 350 acres adjacent to the Cleveland Hopkins International Airport and has more than 140 buildings that include 24 major facilities and over 500 specialized research and test facilities. In addition, Plum Brook Station, located 50 miles west of Cleveland, offers four large, world-class facilities for space technology and capability development on a 6,400-acre installation. All center capabilities are available for government and industry programs through interagency or Space Act agreements.

Google Launches "Google Sky"

Google has teamed up with astronomers at some of the largest observatories in the world to create a new view of the sky. Using Google Maps, this tool provides a new way to explore the universe. You can find the positions of the planets and constellations on the sky and even watching the birth of distant galaxies as seen by the Hubble Space Telescope.

Google Sky includes a number of different ways to explore the universe. The initial view shows the visible universe and is a mosaic of images from the Sloan Digital Sky Survey, the Digitized Sky Survey and the Hubble Space Telescope. Other ways to view the universe include: Infrared (an infrared view of the sky from the Infrared Astronomical Satellite); Microwave (a view of the microwave sky from NASA's Wilkinson Microwave Anisotropy Probe, which shows the universe as it was 380,000 years after the Big Bang); and Historical (the sky as drawn by Giovanni Maria Cassini (printed in 1792) showing the constellations in their classical form.

Go to www.google.com/sky for more information.

About WVSGC

The West Virginia Space Grant Consortium is a group of West Virginia academic institutions with industrial partners who have joined under the sponsorship of NASA in order to encourage and support West Virginia's participation in science and engineering. The Consortium's programs focus on research, fellowships, and K-12 outreach; and a strategic vision for the state's involvement with the nation's future endeavors in science and technology.

The Consortium, which was established in August of 1991, consists of Bethany College, Bluefield State College, The Clay Center, Marshall University, Fairmont State University, NASA IV & V Facility, NRAO Green Bank, Shepherd University, West Liberty State College, West Virginia High Tech Consortium Foundation, West Virginia State University, West Virginia University, West Virginia Wesleyan College, Wheeling Jesuit University, and WVU Institute of Technology. The Consortium is housed in the College of Engineering and Mineral Resources at West Virginia University.

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