The heavily cratered far side of the Moon, perpetually facing away from Earth.
Valuing and engaging alumni

Exceptional ferment of ideas and action is upon Penn Staters as we begin to find ways to move forward. It is an understandably intense time for much-needed reflection, orientation, and reconnoitering a collective future.

Department alumni and their diverse roles are central to our future as a department, as well as college and university. While those of us located on and near the University Park campus have been surrounded by recent and ongoing events, most of our alumni are situated well beyond the State College area. The University is responding to the need for such communication. For example, University President Rod Erickson, well-known geographer and department member, is holding town hall meetings with Penn State alumni across various cities later this week of mid-January as I write.

From a department perspective, we value alumni as a principal feature of our being an “open system” with many functions interfacing outward. Indeed geography alumni are among the department’s most important constituency groups, and we’re fortunate to have Jodi Vender and other department staff ensuring strong ties.

Who are the alumni of Penn State Geography? Answers to this question number as many as alumni, and there are a lot. Alumni of the undergraduate, graduate, and online degree programs count in the thousands. Our current estimate is 4,414 alums. This group is making use of their geography education in varied ways while residing in every state of the U.S. and on all continents. The department’s network of alumni is always growing, adding scores of new members each year who rise from the ranks of the undergraduate majors, dozens with graduate degrees (masters and doctoral levels), and literally hundreds from the online certificate and master’s programs. We’re extremely proud and fortunate to have so many special and distinguished alumni in the realms of academia, business, and government (see for example the newsletter’s alumni profile feature on page 11).

How do we connect? Currently alumni are connected to the department through a diverse array of channels such as department newsletters, our ever-expanding website (www.geog.psu.edu/), the live webcasts of weekly Coffee hour on Friday afternoons, and such open receptions as those at the annual AAG meeting and each year on campus at the end of spring semester—see invitations below—as well as important one-time events (e.g., Greg Knight’s retirement festivities written up in the fall newsletter; http://issuu.com/pennstategeography/docs/newsletter-fall-2011/1).

At this time we’re also delighted to see that many alums are joining our new social networks on LinkedIn and Facebook. (To join, search for “Penn State Geography.”)

We also eagerly await the exciting launch of a departmental Affiliate Program Group or APG. Plans are afoot, too, for expanding alumni roles in mentoring and workshops. Still other important alumni connections occur via the College-wide GEMS organization (Graduates of Earth and Mineral Sciences) that hosts various open events and activities.

Connecting alumni to the department this time of year means a hearty invitation to join in our two keystone receptions, namely:

(i) the annual department reception at this year’s New York AAG meeting. Details are forthcoming.

(ii) the department’s 2012 Recognition Reception scheduled to take place at the Nittany Lion Inn on April 27, 2012. Details are forthcoming.

I look forward to seeing and hearing from you.
Coffee Hour quiz

How well do you recall what you learned during the fall 2011 semester Coffee Hour line-up? Submit your responses to geography@psu.edu by February 24, 2011.

1. What is the marketing technique using a laser inscription to certify that Tanzanite gems bearing it were mined ethically and legally versus “blood diamonds”?

2. Which President strongly influenced what the landscape of the western United States of America was to look like by implementing the Land Ordinance of 1785?

3. What is one of the critical limiting nutrients in terrestrial ecosystems?

4. One of the two African villages students and faculty visited to study food and fuel resources. This village is—unusually—laid out on a grid.

5. How many gallons of water per day flow from the Susquehanna River into the Chesapeake Bay?

6. What is the self-proclaimed diamond capital of North America?

Coffee Hour continues this semester. For the schedule visit:

www.geog.psu.edu/news/spring-2012-coffee-hour-schedule

Calendar of events

February 24–28  AAG Annual Meeting in New York, NY—Watch for your invitation to the Department of Geography Alumni and Friends Reception

March 4–10  Spring Break

March 16–17  College of Earth and Mineral Sciences Exposition (EMEX)

March 30  Supporting Young Women in Geography (SYWIG) Day

March 30  Pennsylvania Geographic Bee

March 31–April 1  no)Boundaries Graduate Student Conference

April 27  Department of Geography Recognition Reception

May 4–6  Commencement

This newsletter is a publication of the Department of Geography in the College of Earth and Mineral Sciences at Penn State.

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Cover photo: Lunar Surface Equirectangular provided by Jay Laura.
Inset, the Far side of the Moon, also provided by Jay Laura

This publication is available in alternative media. Penn State is committed to affirmative action, equal opportunity, and the diversity of its work force.
In the last year, Victoria Wilds has advocated for the “Teaching Geography is Fundamental” Act on Capital Hill, contributed to the “Speak up for Geography” campaign, and spearheaded “Geography Awareness Week” efforts throughout Pennsylvania.

“I first realized geography education was a serious issue in an introductory geography class,” recalled Wilds, 22, who was a meteorology major at the time. “We had weekly map tests and people would mislabel things like the Mississippi river, or they couldn’t find the continent of Africa on a map. That shouldn’t happen at the college level.”

She would eventually learn geography was the only core subject addressed by the No Child Left Behind Act to receive no federal funding (L1), and that the U.S. is one of the few countries in the world without mandatory geography education. This information compelled her to act after a semester-long internship with National Geographic, where her interest in geography turned into a passion.

“I had absolutely no idea what I was getting myself into,” recalled Wilds, who was one of nine National Geographic interns selected for the 2011 spring semester. Encouraged by her geography advisors, she applied in the hopes of improving her chances for the following year. Instead, she was offered a spot and...
moved to Washington D.C. six weeks later.

Wilds worked on a “full story team,” creating maps. She collaborated with photographers, journalists, editors, and designers – a surreal experience for a girl who grew up with a lifetime subscription to the magazine. Her responsibilities changed from day to day and projects were oftentimes unpredictable.

“Sometimes they would come in and say, ‘this story is completely cut, save what you have been working on, but you need to find another story to do,’” said Wilds. “Other times, it would be, ‘Here’s two more stories, everything needs to be done by next week.’”

Towards the end of the semester, Wilds was assigned a story about polar bears and their shrinking habitat. It would be her most ambitious project. She created an interactive map for ipad users, illustrating how climate issues have affected sea ice in the Arctic Ocean.

“The map contained the full Arctic Circle…and then when someone would swipe their finger across the bottom of the page, the ice would grow and shrink,” explained Wilds, who compiled 50 years of data in each layer of ice.

At the monthly mapping critique, Wilds held her breath as editor-in-chief Chris Johns (L2) evaluated her work. After a brief inspection, he looked up and said, almost as if it were a question, “You made the ice move.”

“I grew the most working on that project because I started with a blank slate,” she said. “…And everyone liked it. I created something that someone at National Geographic approved of,” she said, still finding the concept hard to believe.

In addition to furthering her skills as a geographer, National Geographic reinforced her interest in geography education. During the annual meeting of the National Geographic Geography Education Alliance coordinators (L3), Wilds spoke directly with state representatives, trying to acquire co-sponsorship for the “Teaching Geography is Fundamental” Act, a bill to allocate funds for education programs in K through 12 classrooms. She also helped create a web page (L4), making it easier for people to send letters to their state representatives, supporting the bill. By Geography Awareness Week—November 13 to 19, 2011—Congress had received more than 10,000 letters.

This semester at Penn State, Wilds continued her involvement in geography education as the Geography Awareness Week intern. She helped create a state-wide poster competition, which asked students to design a poster, reflecting the theme, “Pennsylvania Geography: the Adventure in my Community.”

“We had an amazing turn out for the poster contest, especially since it was the first time we had ever done it,” Wilds remarked. “We were expecting to have maybe 100 students send something in, and we ended up with 550 submissions.”

Next semester, Wilds will continue her involvement in geography awareness through the UnderDoGS (Undergraduate Students in the Department of Geography.) As she closes in on her graduation in May, Wilds’s dual interests in GIS and geography education will come to a head.

“I’m not leaning towards either at the moment,” she said. “I considered going to grad school for a masters in geography education but at this point, I am looking for cartography, entry-level jobs just to start out. Ideally, I would like to find a way to do both at the same time. That would be pretty perfect.”
GRADUATE STUDENT NEWS

Caps and gowns
MGIS students traveled to University Park on December 17, 2011 to participate in Graduate Commencement. Back row, left to right: Beth King (B.S. ’96, current faculty), Jon Soderberg (Bristow, Virginia), John Bambrick (Charlottesville, Virginia), Anthony Robinson (M.S. ’05, Ph.D. ’08, current faculty). Front row, left to right: Frank Hardisty (Ph.D. ’03, current faculty), Linda Foster (New Underwood, South Dakota), Sarah Troedson (Sacramento, California), Paulina Fernandez Luengo (Katy, Texas).

UNDERGRADUATE
The Alpha Tau Chapter of Gamma Theta Upsilon (GTU), the International Geographical Honor Society, inducted seven new members during a ceremony on Tuesday, November 15, 2011 in 20 Deike Building. The new members are: Branden Belajac, Lorraine Dowler, Yiting Ju, Andrew Lehnerd, Jill Mailloux, Will Mitchell, and Bo Yao. Dowler was also the event’s featured speaker.

GRADUATE
Several graduate students participated in the 18th Annual Critical Geography Conference: Constructing a radical politics in an age of crisis (www.criticalgeography.org/) held Nov 4-6, 2011 at Worcester, MA. The students included: Jenna Christian, Matt Branch, Vanessa Massaro, Nicole Laliberte, Emma Gaalaas Mullaney, Maureen Biermann, Arielle Hesse, Crista M. Livecchi, Whitney Smith, Patrick Hammons.

With great joy, Abbey Tyrna and Matt Leshko welcomed their daughter Adaline Claire on November 13, 2011.

Eighteen students graduated in the MGIS program in fall 2011. They are:

- Brian Aldrich
- John Bambrick
- Desmond Carroll
- Paulina Fernandez Luengo
- Linda Foster
- Andrew Furne
- Christy Graves

continued on page 10
Online geospatial education thrives

Where they are
A map shows all Penn State online Geospatial programs alumni.

Nice to meet you!
MGIS student John Bambrick (left) and Frank Hardisty meet face to face for the first time at Fall 2011 Graduate Commencement held at Eisenhower Auditorium on December 17, 2011.

Since 1999, the Department of Geography has served more than 4,000 students in online geospatial education certificate and degree programs.

Geography’s online programs are supported and delivered by more than 30 faculty and staff working in the College of Earth and Mineral Sciences John A. Dutton e-Education Institute. The Institute helps develop and sustain online educational programs across the College, but its genesis was in online GIS education, pioneered by then-Geography faculty member David DiBiase.

Demand for continuing education among GIS professionals continues to increase year-over-year, and the department’s award-winning programs enjoy an unparalleled reputation as the most desirable professional GIS credential. Department and Dutton Institute faculty are constantly engaged in the mission of sustaining this vital mechanism for outreach, and new programs and course options are always in development.

Continuing GIS education for alumni

If you’d like to learn more about the department’s online geospatial education programs, please visit www.pennstategis.com. If you are a current or aspiring GIS professional and you are an alumnus from the department, you could join many of your peers in taking one or more of our online offerings to explore new skills and application areas. It’s possible to take single courses for personal enrichment, even if you’re not interested in completing a certificate or degree.

Open course content

Most of the department’s online GIS course content is available for free through the College of Earth and Mineral Sciences Open Educational Resources initiative. Faculty can choose to share the resources they develop for online classes through this initiative, and Geography has provided the most materials so far in our College. Open courseware can be found at http://open.ems.psu.edu/courseware.
Q: What kind of geographer are you?
A: I am a physical geographer, hired as an Earth System Scientist, and also a graduate faculty member in the Ecology program.

Q: How did you get started in your career?
A: I began as a geologist and environmental studies double major at Tufts University. My M.S. is in Resource Conservation at the University of Montana (Missoula) through the College of Forestry and Conservation. My thesis was measuring changes in smoke chemistry through seasonal burning patterns in Zambia, where I did field work for a summer.

We found that the types of carbon (carbon dioxide versus methane) change as the fire behavior shifts through the dry season, which has implications for management of biomass burning and global climate change. This project interested me in broader questions in Earth System Science and specifically changes in carbon cycling and disturbances.

For my Ph.D., I went to Oregon State University where I used a landscape ecology and modeling approach to quantify the potential losses of carbon from disturbances in the Pacific Northwest.

My post-doctoral research at the University of Wisconsin, Madison, was focused on understanding the effects of a large disturbance event, stand-replacing fire, on carbon and nitrogen cycling in Yellowstone National Park.

Q: What is your primary research focus now?
A: My primary research interest is understanding how ecosystem disturbance affects ecosystem function at multiple scales. I work in several regions (Yellowstone, Eastern U.S., Africa --Ghana, South Africa, and the Upper Midwest-- Wisconsin) and have had funding from NASA, DOE, USDA, and NSF to carry out these projects.

In general, these projects are motivated by several emerging themes:
1. the importance of including disturbance dynamics into forecasts of ecosystem change, and
2. the need to understand coupled socio-ecological resilience through a complex systems perspective to predict tipping points of landscape change.

I am increasingly working at the intersection of social and physical sciences. My participation in the Parks and People study abroad program is an example of

"Landscape ecology can be increasingly used as a lens for tackling complex issues such as human health, social-environmental networks, climate change, and education."

Photos taken at Mkambathi Nature Reserve, Eastern Cape Province, South Africa
my increasing interest in merging disciplinary perspectives in a place-based approach to contextualize challenges in ecosystem conservation and management.

No longer can pressing environmental challenges be addressed by biophysical scientists alone. Rather, the conservation is richer and the outcomes greater when faculty, students, and stakeholders can begin to address these challenges through multiple disciplinary perspectives, and with an appreciation of heterogeneous dynamics in space and time that shape the capacity for socio-ecological change.

I am also increasingly using models and data-intensive approaches to answer questions about future landscape change. My goal in these efforts is to improve model representation of disturbance dynamics and to attribute uncertainty in our understanding of future global changes.

**Q: How can geographers help address humanity’s problems and challenges?**

A: As a geographer and ecologist, I believe geography is uniquely poised as a discipline to contribute to contemporary challenges in society and the environment.

I have found it incredibly enriching to work with faculty and students who have expertise in theory, cognitive and geospatial analytics, and social-physical science. All of these skills are needed to address current global challenges. The particular emphasis on scale, and spatio-temporal variability allows for new ways of imagining options for change.

**Q: So far, what finding or outcome are your most proud of?**

A: I am particularly proud that three of my research grants have links to K-12 education.

In South Africa, we are working with local schools to improve education on biodiversity and climate change. In Ghana, working as a co-PI (Petra Tschakert is the lead PI), we are working to improve understanding of an emerging disease, Buruli Ulcer, through the lens of resilience and complex systems science. This work is fostering a sister-school approach and fostered learning in which interactions are occurring across grades and cultures. I am also a co-PI on a grant (CarbonEARTH) that enables graduate students to teach about carbon in local schools, which has led to several interesting projects such as green infrastructure design and sustainability.

**Q: What are your research plans for the future?**

A: In the future, I hope to broaden the scope of my research group, LEAPS, to engage the broader Penn State community in landscape scale issues of disturbance ecology, geospatial tools and models, and climate change adaptation/conservation management.

Landscape ecology can be increasingly used as a lens for tackling complex issues such as human health, social-environmental networks, climate change, and education.

**Q: Does being a parent influence how you approach your work or vice versa?**

A: Being a working mother and a parent certainly influences my approach to science. On a practical level, it provides (rather than takes away) balance in my life.

On a personal level, it has led to many close friendships among colleagues who struggle with maintaining high standards of excellence at work and home with the associated challenges of limited time and energy.

On a professional level, it motivates me to do better science, to engage internationally, and to focus on educational approaches that have immediate and real outcomes. I am struck constantly that my children will live in a very different world from the one I grew up in, and while my kids would, at the moment, much rather be a chef or a rock star, the least I can do is inspire them to think critically about the world and their role in it.

It also means I can bring stuffed animals into the classroom to teach about trophic food chains, or mention the popular culture of climate change by referring to the movie *Happy Feet Two*. I embrace these linkages more and more.

The more I open myself and my students up to the personal side of being a scientist and mother, the more I can see students inspired about the potential in their own lives.
Where does Geography take you?

Alumnus Brian Romig (B.S. ’91), a water commissioner with the Colorado Department of Natural Resources (and brother of department staff member Denise Kloehr), proudly sports his UnderDoGS T-shirt atop the Maroon Bells in Colorado’s White River National Forest.

Send a photo of where geography takes you to geography@psu.edu.

Geography Community Updates

Elena Horvath
Susan McClendon
Maureen O’Mara
Jeff Rester
Samantha Sancho-Herrera
Jon Soderberg
Kevin Stofan
Duane Treadon
Sarah Troedson
Howard Yamaguchi

Maureen Biermann reviewed the book, Climate Change, Ethics, and Human Security for the Annals of the Association of American Geographers, Volume 101, Number 6, November 2011

FACULTY AND STAFF

Brian King won a CAREER award from the National Science Foundation’s (NSF) Geography and Spatial Sciences (GSS) program

At the 18th Annual Critical Geography Conference: Constructing a radical politics in an age of crisis held November 4–6, 2011 at Worcester, MA, Melissa Wright gave the Clark University Geographical Society (CUGS) Speaker Series Lecture: “¡Acción!: Activism at the crossroads of femicide, narcoviolence and neoliberalism” and served on a plenary panel and Lorraine Dowler was a discussant on “Feminist challenges to geopolitics in an age of crisis.”

Masahiro (Masa) Takatsuka, from the University of Sydney, visited the department and GeoVISTA Center for a month during fall semester 2011. Read a full profile at www.geog.psu.edu/

Petra Tschakert attended the Durban Climate Change Conference in November 2011 and organized a side event on Gender, Justice and Social Learning: Exploring Theory and Practice in Adaptation.

Alan Taylor and Andrew Carleton collaborated with geographers Carl Skinner, of the U.S. Fire Service, and Valerie Trouet, an assistant professor at the Laboratory of Tree-Ring Research at the University of Arizona, to study the relationship between climate patterns in the Pacific Ocean and subsequent fire activity. Their research findings were published in the June 2011 issue of Fire Science Brief.

ALUMNI

Adria Reutzel (B.S. ’00) and husband Will celebrated the birth of their daughter, Neve Marie, on August 16, 2011.

Corene J. Matyas (Ph.D. ’05), an assistant professor in the Department of Geography at the University of Florida, won a CAREER award from the National Science Foundation’s (NSF) Geography and Spatial Sciences (GSS) program.
ALUMNI PROFILE

“Now that I think about it, it’s hard to imagine how I could have been anything else but a geographer!”

Andrew Comrie (Ph.D. ’92)
Associate Vice President for Research and Dean of the Graduate College; Professor, Geography & Development, Atmospheric Sciences, Public Health, University of Arizona; Americas Editor, International Journal of Climatology

Comrie ascribes having a global perspective at an early age to his experiences growing up in South Africa under Apartheid. This in part led to the pursuit of bachelor of science degrees in Geography and Atmospheric Science and then a master of science in Environmental and Geographic Science at the University of Cape Town.

There, he says a great teacher, Cecil Keen (now at the Minnesota State University at Mankato) “opened my eyes” to climatology and encouraged him to attend graduate school in the United States.

Internships and research experiences were transformative for Comrie, who began to see how he could have a career as a government scientist. Then he came to Penn State where he realized—with the guidance of faculty mentors Deryck Holdsworth (then director of graduate studies), Brent Yarnal (who became his advisor), and Rob Crane—he could “be creative in research, solve important problems, and communicate my work through publication and presentations. I loved that mix and I still do.”

He advises students to “talk to your professors and peers. It is so easy to be a wallflower and not stop by someone’s office or get advice. These interactions can really open up possibilities you have never thought about.”

“Not only did I learn the breadth and depth of geography and climate, but I learned the value of a good listening ear for an unsure student. I use those lessons every day as Graduate Dean, solving student issues and promoting learning through multiple research paradigms. People have remarked many times how being a geographer has enabled me to appreciate what they do across many disciplines.”
Mapping the Moon

Question: What’s the difference between a high school marching band director, a mountain climber, and an extraterrestrial cartographer?

Answer: Altitude.

In this case, they are all the same person: MGIS student Jay Laura, also a self-described computer geek. Laura is a full-time music teacher with the Springfield Public School District in Springfield, New Jersey. He’s the high school marching band director and organizes a winter musical every year. In his spare time, he is an avid rock climber, glacier explorer, and distance runner. And now he’s making maps of the Moon for the Lunar Lion Team. (See sidebar on The Lunar Lion, page 13.)

The audition

Four years ago, as Laura was considering going back to school for computer programming or network administration, a friend who worked in disaster management showed him some GIS tools. “Needless to say, I was pretty interested. Computers plus maps ... what a great idea!”

A little more exploration of the GIScience field showed that it would fulfill his goals: “I really like to be challenged, working on new projects, learning new skills, and building things.” Prior to getting his job as a music teacher, Laura worked as an electronic instrument repair technician.

“Two things really attracted me to the Penn State program,” Laura explains, “First, the ability to enroll in the certificate program, earn the certificate, and then apply to the masters program was a big deal. Since I did not earn a bachelor’s in geography, planning, or another closely related field, I knew that I needed some way to show that I ‘had what it takes’ in this field.”

“Jay is typical, in many ways, of our MGIS students—particularly career changers,” notes his advisor Doug Miller, director of the Center for Environmental Informatics in the Earth and Environmental Systems Institute. “These students tend to be very passionate about their new profession and work at excelling in all aspects.”

Laura calls the certificate program an “audition,” not only for himself but also for the program and how well it would fit his goals. Both passed. “The pacing, content, and most importantly, quality of the education are why I selected this program,” he says. “This is, in my opinion, directly attributable to the faculty who have created and implemented the classes. It is obvious that a lot of forethought has gone into the development...
The second thing that Laura liked about the Penn State program was its flexibility. “This is a professional degree which does not necessarily entail a lot of research, although as I have progressed through the program I have started to focus more on gaining admittance as a Ph.D. student. Research experience is an important component of that, and many of the courses have offered flexibility in the final projects to integrate a research component,” Laura explains.

The internship

Having a summer home in Flagstaff, Arizona provided an opportunity for Laura to pursue an internship with the USGS Astrogeology Science Center there. The center was established in 1963 to provide lunar geologic mapping and assist in training astronauts destined for the Moon. Since then, its mission has grown to include processing and analyzing data from numerous missions to planetary bodies in our solar system.

“I was on a conference call with David DiBiase after my first GIS certificate course and he really pounded home the need for practical experience,” Laura recalls. “I am fortunate to have a friend who volunteers at Lowell Observatory and he was able to put me in touch with someone at the USGS. One thing led to another and I started (way over my head, I thought) that summer.”

Laura has been volunteering at the USGS Astrogeology Science Center for the last two years creating automation scripts, organizing data, and performing general GIS tasks. “This was my first practical, on-the-job experience using GIS and my time there has really developed my interest in working with planetary data. Work there has included processing hyperspectral images of Titan, the solar system’s most Earth-like body, and the creation of image processing tools,” he says.

The right place and the right time

Late in the spring 2011, Laura drove from his home in New Jersey to Penn State to spend a day meeting with faculty in the MGIS program. He met with Miller to discuss the required MGIS capstone project and to explore how that project might fit with his summer internship experiences at USGS in Flagstaff.

“I was immediately impressed with Jay and his intellectual depth—was this really a music teacher?” Miller recalls.

Laura described the details of his work at Flagstaff and the extensive image processing experience that he was gaining.

“Jay and I discussed a recent inquiry from the Penn State Lunar Lion Team. The team was in need of GIS and remote sensing skills to aid in the selection of a lunar landing site and Jay’s experience working with imagery at Flagstaff could be valuable to the team,” Miller says, adding, “I wondered, would he be...”

Penn State joined the Google Lunar X-Prize Competition to land a privately funded spacecraft on the Moon by 2015. The launch and execution of Penn State’s craft—the Lunar Lion—will be the culmination of a multiyear, interdisciplinary effort to meet the requirements of the competition and vie for its top rewards.

A commercial launch vehicle will carry the Lunar Lion into space and place it on a trajectory to the Moon. Following five days of cruise, the Lunar Lion will execute a controlled descent to the lunar surface. While the craft transmits high-resolution photographic images and video to the mission operations center at Penn State, the Lunar Lion team will pinpoint the craft’s location and plan the flight for its next maneuver. Upon command, the Lunar Lion will fire its engines again, lift off the surface, and execute a short flight to the second landing site while capturing footage of the Moon’s cratered landscape.

In this mission, the Lunar Lion Team will compete against twenty-eight other teams to accomplish the first Moon landing in more than thirty years. Just as importantly, it will position Penn State as a force in the growing field of private space exploration.

For more information visit: http://lunarlion.psu.edu/homepage.php
interested?”

“I selected Jay for the team for two reasons,” says Lunar Lion Team Leader Michael Paul, a space systems engineer at Penn State’s Applied Research Laboratory. “First, he was in exactly the right place at exactly the right time and second, Jay’s intelligence and enthusiasm were readily apparent. All engineers and scientists need to communicate their work to others. Some, like Jay, are inherently excellent at getting their message across. It is this ability to tell a complex story that makes him stand out.”

From the beginning of the program, Paul explains, he had intended to make use of the images from NASA’s recent Moon mission, the Lunar Reconnaissance Orbiter. These images are at an unprecedented level of resolution, allowing the team to identify a low-risk landing sight, minimizing any difficulties the Lunar Lion would encounter as it touches down on the Moon.

When Paul learned that Laura had been working with the team at the USGS Flagstaff office, “I was thrilled!” he exclaims. “I knew the data was out there to be processed into the information we needed. The fact that the most recent data and the most advanced processing techniques are available through a Penn State graduate student speaks well of both Jay’s capabilities as an individual and Penn State’s ability to provide its students with world-class opportunities.”

Laura spent most of summer 2011 at Flagstaff working on the challenge of creating Lunar Reconnaissance Orbiter (LRO)-based digital elevation models using advanced photogrammetric methods.

Miller evaluates Laura’s report on his summer’s work in a word, “astounding!”

“Jay had tackled this significant challenge head-on, bootstrapped himself up-to-speed with an advanced open-source photogrammetric package and created a detailed, high-resolution digital elevation model of the lunar surface. Additionally, he was able to create a panoramic ‘fly-through’ of the lunar surface for the team to gain a sense of the range of landing possibilities for the Lunar Lion. His work on the landing site challenge continues—with his most recent efforts to calculate detailed roughness parameters for the lunar surface in the landing area desired by the Lunar Lion Team,” Miller says.

In his role as the lead GIS analyst for the Lunar Lion project, Laura continues to collect and process the remotely sensed images used to create Digital Elevation Models (DEMs) or 3-D maps of the intended landing area. “With these DEMs we will have high-resolution cartographic products which are a key component of site selection, Laura explains. “Additionally, I am working synthesizing a few different hazard detection methods, used by NASA on the Mars Science Laboratory mission, into a single pipeline. Simply, I am providing the team with as clear a picture as possible of what the surface looks like. With that information, we will be able to pick an operationally safe landing area.”

The Moon has different types of terrain. Some are very steep and rocky, and would not be suitable to land a craft, for fear of it rolling over or hitting a boulder. Other areas are quite flat and covered with many hundreds-of-millions of years worth of accumulated dust.

An operationally safe landing area, Laura notes, is exactly what you might imagine it to be. “Here is a walk through the process as well: The team as a whole decides on a few spots that are of interest. In a NASA mission this involves balancing a lot of competing goals. In our case the decision has, thus far, been based less on science objectives and more on proximity to familiar landmarks,” he explains.

“I have been involved at this point to highlight where we have the ability to generate hi-res elevation models. We need to have the highest possible resolution imagery—We can see and identify a Mini Cooper-sized object—to be able to avoid hazards (craters and boulders). Once the team has selected a few different regions they pass those requirements to the trajectory guys. The trajectory team then selects a few general landing areas which fulfill their travel requirements. A safe area then has low slope, low surface roughness, and, ideally, zero hazards larger than 0.5 meter,” Laura explains.

“The next step is really exciting,” Laura says. “I am looking forward to getting the data onto the web in a GIS which allows for team members to manipulate the data further. While the core team is in State College, we have people from all over the country working on this project. I want to facilitate the collaborative selection process through a webGIS.”

Follow Jay Laura:
http://personal.psu.edu/jzl5325

USGS Astrogeology Science Center:
http://astrogeology.usgs.gov/

The online Geospatial Education Portfolio:
www.worldcampus.psu.edu/gep

Center for Environmental Informatics:
www.cei.psu.edu/cei_wp/

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Geography Awareness Week (GAW) is a public engagement campaign spearheaded by National Geographic since 1986 and observed during the third week of November. This year’s theme, “Geography: The Adventure in Your Community,” promotes the idea that the geographic perspective is an important way to understand every community. The Department partnered with the Pennsylvania Alliance for Geographic Education (PAGE) to launch an inaugural poster contest for K-12 students. Staff member Jodi Vender, a PAGE steering committee member and GAW coordinator for the state, and senior Victoria Wilds organized the competition, which attracted more than 550 entries from students throughout the state.
WE ARE ... GRATEFUL FOR YOUR SUPPORT!

We extend our deepest gratitude to all alumni and friends who have given financial support to the Department of Geography during past six decades. Without these generous contributions, many scholarships, research experiences, and awards would not be available to our students and faculty.

We especially wish to recognize those who contributed to the department between July 1, 2011, and December 21, 2011. Their names are listed below.

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