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Professor Snezana Stanimirovic with four Astronomy 510 students in front of the 2.3-meter Small Radio Telescope (SRT) on the roof of Sterling Hall. From left: Paul Sell, Stanimirovic, Nick Pingel, Al Lawrence and Matt Huang.

New Radio Astronomy Lab Course Yields Big Results

You may have wondered about a small black radio dish on the roof of Sterling Hall. It is the latest addition to the array of telescopes operated by the Astronomy Department—a 2.3-meter radio telescope that scans the sky over a range of frequencies from 1400 to 1440 MHz and provides hands-on experience for students in Astronomy 510, the department's new Radio Astronomy Laboratory course.

Professor Snezana Stanimirovic received the Cottrell Scholar Award from the Research Corporation for Science Advancement in 2009 for her research and educational work, with part of her proposed work being to develop telescopes and curricula in radio astronomy for Wisconsin students.

The radio dish is the first of three Small Radio Telescopes (SRTs) purchased from the MIT Haystack Observatory. The SRTs emphasize UW-Madison's long tradition of radio astronomy, going all the way back to the "father of radio astronomy," Karl Jansky, who was a UW physics undergraduate.

The first SRT was put together by Rick VanDer Geest and Rick Williams in the depart-

ment's electronics shop. First light was achieved last December, and the telescope played a central role in the spring upper-level Radio Astronomy Laboratory course. The course covers the fundamentals of radio antenna theory, calibration and observing methods through a combination of lectures and hands-on observational experiments.

"It's exciting to have a very small telescope work so well and obtain HI spectra comparable to what has been achieved with professional telescopes."

—Snezana Stanimirovic

Undergrad and grad students Matt Huang, Al Lawrence, Nick Pingel, Paul Sell and Anna Williams first observed the Sun in order to measure basic telescope properties—beam shape and noise properties. In later labs, the students measured the height of the neutral hydrogen (HI) disk and the rotation curves of the Milky Way. "Everyone was very excited to be able to run the telescope and collect data from the warmth of a classroom in the midst of a blizzard on a cold wintry day. We compared our SRT observations with published data and in most cases got excellent agreement," says Stanimirovic. "It's exciting to have a very small telescope work so well and obtain HI spectra comparable to what has been achieved with professional telescopes."

This summer, one of the Astronomy 510 students, Al Lawrence, a returning

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Letter from the Chair



Jay Gallagher, Astronomy Department Chair

The sudden arrival of fall in Wisconsin, with temperatures near freezing after a record-hot summer, serves as a reminder of how quickly circumstances can change. This aspect of reality also applies to academic departments, and as 2012 draws to a close, we find ourselves in flux. Many changes are good, some are challenging, but all are part of progress that includes new opportunities.

The quality of our educational and research contributions depends on our people. Welcoming Dr. Elena D’Onghia, who arrived in late summer from the Harvard-Smithsonian Center for Astrophysics, to our faculty represents another step forward in growing the intellectual foundations of our program. Elena, origi-

nally from Italy, is a noted scientist who studies how cosmic objects, ranging from planetary systems to galaxies, evolve over time. Her theoretical research thus crosses several traditional subject area boundaries within astrophysics and adopts a modern physical-process-based approach. Her presence enhances a key strength of our department, which lies in combining theory and multi-wavelength observations to address astrophysical issues.

New perspectives on astronomy and astrophysics also flow from our post-doctoral scientists, people who are fresh from their PhD theses, brimming with new ideas for exploring the universe. We have been fortunate to host a growing cadre of postdocs, some funded by grants and others by gifts to our department. These newly minted astronomers not only add scientific breadth, but also bring insights from other universities to our department. The shift to a younger scientific population in our department is a major success of the strategic planning process carried out under Bob Mathieu, our previous department chair.

The “living in interesting times” aspect of the current astronomical environment primarily stems from the evolving funding situation for astronomy in the United States. On the one side, impressive new observatories are coming into operation such as the *Atacama Large Mil-*

limeter Array, a powerful array of radio telescopes located in the Chilean Andes. On the other side, new observatories are expensive, and our federal funding agencies therefore have a problem meeting their budgets while supporting highly productive older telescopes. This balancing act is becoming more difficult and may impact us in several ways, especially at the WIYN Observatory, where the NSF-funded National Optical Astronomy Observatory is a major partner.

In the meantime, we are pleased to see continuing progress in the capabilities offered by our telescope partnerships. At WIYN, a prototype One Degree Imager camera is being commissioned and is producing excellent results. The first data are arriving from the Wisconsin-built Robert Stobie Spectrograph on the Southern African Large Telescope (SALT), demonstrating the promise of this facility as it reaches towards its full potential. The founding this summer of the Washburn Astronomical Laboratories, with support from the College of Letters & Science, enhances our ability to develop astronomical instruments and software. We further benefit from publicly accessible, multi-wavelength observatories such as the NASA *Hubble Space Telescope*, *Spitzer Space Telescope* and *Kepler Space Telescope*, and NSF-funded *Karl G. Jansky Very Large Array* (an array of radio telescopes in New Mexico named after UW–Madison Class of 1927 physics BS graduate Jansky), along with national access to large-scale computing for theoretical modeling.

We are fortunate to live in a time with amazing resources for exploring the universe, and to be at a university that supports our efforts. My Wisconsin astro colleagues and I therefore can look forward to continuing to share our evolving understanding of the universe with you.

Jay Gallagher
Astronomy Department chair

The *Washburn Observer* is the alumni newsletter of the Department of Astronomy at the University of Wisconsin–Madison.

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Natalie Gosnell Leads Department Forward



Natalie Gosnell kayaking in Alaska

A running joke with the Astronomy Department graduate students is that if you sign up to staff Washburn Observatory public observing nights with fellow grad student Natalie Gosnell, you can schedule something else to do that night. That's because for the past four years, the weather has been cloudy and the telescope has stayed closed every time Natalie has been scheduled. That's a total of 12 times!

Born in Colorado Springs, Colorado, Natalie grew up in Denver. "I always loved astronomy and physics. My dad was interested in it, and my favorite gift as a child was a telescope. I went to Space Camp when I was 10 years old. It seemed inevitable that I'd go into astronomy," she says.

Natalie was a physics major at Colorado College and did a Research Experiences for Undergraduates (REU) program at UW-Madison in summer 2007. "That's the reason I'm here for grad school," she says. "In college I realized it was possible to do astronomy as a career, so I did the REU to find out what that would be like."

Working with Professor Bob Mathieu on her thesis research, she is looking at observational signatures of close stellar encounters in open clusters. Specifically, she is investigating the

formation mechanisms of blue straggler stars. The *Hubble Space Telescope* data they receive this fall will be the main part of her thesis. "Bob and I are very excited about the *Hubble* data," she says. "We'll be looking for white dwarf companions of blue straggler stars—stars that defy normal ideas of stellar evolution. If we detect white dwarfs, it will be the first time anyone has directly determined the formation mechanism of a group of blue stragglers."

Natalie is also working with Professor David Pooley of Sam Houston State University in Huntsville, Texas, on X-ray binaries in open clusters that are often formed through dynamical encounters. He was a postdoctoral fellow at UW when Natalie started, and Mathieu urged her to broaden her research experiences by working with other astronomers, too. "I have been lucky enough to have two parts of my thesis, related scientifically but quite different technically," she says. "I think the breadth of my skills gained at UW will lead to a richer career, and will help me find a job."

In addition to her science work, Natalie sings with the Wisconsin Chamber Choir, also serving on its board, and the Isthmus Vocal Ensemble. "Singing is my longtime love. I sang in college, and I looked for singing opportunities when I was looking at grad schools," she says. "It's important to have a creative release when you're doing science all the time."

Natalie was part of a departmental committee to implement a family and medical leave policy for grad students. She and Professor Mathieu will be featured at a special session of the American Astronomical Society meeting in Long Beach, California in January. "It was a great example of grad students and faculty working together," she says. "Its success was also an example of the importance of our Board of Visitors' financial support."

With fellow grad students

Blakesley Burkhart and Katelyn Milliman, Natalie helps run the Women of Wisconsin Strengthening Astronomy (WOWSA) group. They meet and network about career issues with women colloquium speakers and visitors. With Mathieu and Christy Tremonti, she also served on the committee that revitalized the "Committee of Three" graduate advising process that ensures that every grad student has an advisor and two faculty members to serve as mentors.

"I think the breadth of my skills gained at UW will lead to a richer career, and will help me find a job."

—Natalie Gosnell

Natalie was awarded a Sigma Xi grant this year to fund her travel to visit collaborators working on the *Hubble* data in Canada and England. She has also received a Vilas Conference Travel Grant, Wisconsin Space Grant Award and American Astronomical Society Travel Grant.

Her publications include "An Unexpected Discovery in the Rich Open Cluster NGC 6819 Using *XMM-Newton*" in the 2012 *Astrophysical Journal* about discovering a candidate quiescent low mass X-ray binary candidate in open cluster NGC 6819. Her accepted *Chandra* proposal, for which she was the principal investigator, will include follow-up observations to confirm the object. She will receive a 22-kilosecond *Chandra* observation and one orbit of *Hubble* imaging to find the counterpart to the quiescent low mass X-ray binary.

Natalie will graduate in 2014 and will apply for a postdoctoral position. Ultimately, she hopes to teach at a liberal arts type school like her alma mater, Colorado College.

David Radzanowski Gets Things Done at NASA



David Radzanowski

Having an astronomy background gave me a leg up in articulating to decision makers what NASA is doing and why it is doing it. Linking astronomy and public policy has been a great combination," says David Radzanowski, Chief of Staff for National Aeronautics and Space Administration (NASA) Administrator Charles Bolden.

That combination is a bachelor's degree in Astronomy-Physics from the UW-Madison in 1988 and a master's degree in Public Policy and Management from Carnegie Mellon University's Heinz School of Public Policy in 1990.

As an emeritus Astronomy Department Board of Visitors (BOV) member, Radzanowski organized a recent BOV

visit to the Kennedy Space Flight Center for the last Space Shuttle *Atlantis* launch. He served on the Board from 2009–10, when he became NASA Chief of Staff, and resigned because of a possible conflict of interest. "I hope they will welcome me back once I'm in a role that doesn't affect the UW," he says. "My career is rooted in my love for astronomy and space, and my continuing relationship with the UW is important to me. I continue to live vicariously by keeping up with what's going on there."

He recalls student presentations at the BOV meetings. "It's fascinating to see how far we've come. The expertise that I saw in the department in the 1980s is still there. UW is such a leader in astronomy and astrophysics," he says.

Professor Bob Bless was principal investigator on the Hubble High Speed Photometer (HSP) when Radzanowski was at UW, and he was very interested in the project. *Hubble* hadn't launched yet. When it launched in 1990, the flaw in the mirror was discovered. "It's ironic that in my first job out of school, in my first report to Congress, I described the flaw in the *Hubble Space Telescope's* mirror and what the fix was—removing the HSP, Dr. Bless's instrument," he says.

"I'm the guy people come to for getting things done," is how Radzanowski describes his role at NASA. In a typical day, he might interface with the White House on public relations efforts, make

sure a launch project is meeting its performance goals, or be the go-between for research scientists and Bolden on the subject of next year's budget. He received NASA's Outstanding Leadership Medal in 2011 and a Meritorious Presidential Rank Award in 2009.

Radzanowski's interest in space began as a young child. "When I was 4 years old, my father pointed to the moon in our backyard in Pittsburgh to show me where the *Apollo 11* astronauts—Neil Armstrong, Buzz Aldrin and Michael Collins—were," says Radzanowski. "Our family was watching the mission's coverage on TV in the summer of 1969."

From that point on, Radzanowski had a lifelong love affair with space. Along with other children of his generation, he wanted to be an astronaut. As a teenager, he watched coverage of the *Viking 1* and *Viking 2* landing on Mars, and when the Space Shuttle was being developed, he was an outstanding science student. As an undergrad at the UW, he cried along with the rest of the world as he watched the *Challenger* explosion.

Prior to joining NASA in 2006, Radzanowski served at the White House Office of Management and Budget (OMB) and at the Congressional Research Service on Capitol Hill.

Part of this story originally appeared in Carnegie Mellon Today. It is reprinted with permission.

New Course *continued from page 1*
undergrad with an electrical engineering background, worked with Rick VanDer Geest in assessing the best location for the second telescope. Because of the radio interference on campus (TV and radio stations and cell phones), they decided to place the telescope at the Pine Bluff Observatory. Construction will be completed this fall, and students will have remote access to it.

The third SRT is on loan to UW-

Milwaukee and is being developed by physics professor David Kaplan for his students. While all three telescopes are now being used independently, the long-term goal is to connect their signals and create a small radio interferometer similar to the *Karl Jansky Very Large Array* in New Mexico.

While the SRTs are currently being used only for upper-level classes, future work includes the development of tutorials for introductory astronomy classes.

Non-science majors will then be able to obtain HI spectra of the Milky Way and explore important concepts (Doppler shift, rotation curve and dark matter) in a hands-on environment and gain an understanding of the process scientists use to create knowledge.

With more telescopes on board, one important task remains—naming the department's SRTs! We invite your suggestions. Please submit them to Professor Stanimirovic at stanimi@astro.wisc.edu.



Hubble HSP on Display at Space Place



HSP on display at Space Place

After 535 million miles of space travel, the High Speed Photometer (HSP), designed and built at UW–Madison and one of the original scientific instruments on board the *Hubble Space Telescope*, has returned to Madison and is on permanent display at Space Place, the department’s education and public outreach center. It

weighs 600 pounds and is about the size of a phone booth.

“We’re glad to get it back,” says Bob Bless, emeritus UW–Madison astronomy professor whose team designed and built the instrument. “NASA has a knack for losing things.”

Developed at the UW Space Astronomy Laboratory and the Space Science and Engineering Center, HSP was one of five instruments aboard the telescope when it first went into orbit aboard the Space Shuttle *Discovery* in April 1990. It was the only element of the \$6 billion space telescope built by a university. Nearly 100 graduate and undergraduate students played roles in designing and building HSP. Many went on to successful careers in the aerospace industry.

HSP could measure the brightness of stars and other celestial objects at a rate of 100,000 times per second. It had no moving parts, depending instead on the

Hubble Telescope itself to route starlight through its multiple tiny apertures.

HSP’s unique capabilities were never realized because of the flawed *Hubble* mirror and the shaking caused by excessive flexing of the orbiting observatory’s original solar panels. Regrettably, it was removed from *Hubble* in 1993 and replaced by COSTAR, the optics package needed to correct the images blurred by the telescope’s misshapen mirror.

Despite these obstacles, the HSP team was able to measure the first high-speed ultraviolet light curve of the Crab Nebula pulsar; photometric measurements that revealed 43 different structures in Saturn’s ring system; the first high-speed ultraviolet photometry of an eclipsing dwarf nova over a complete eruption cycle; and polarimetric measurements of a gravitationally lensed pulsar.

Backup Plan Works for Nick Pingel

Sometimes it helps to have a backup plan. Undergrad Nick Pingel, now a fifth-year senior, entered UW–Madison as a pre-med student but decided to major in physics instead. Next spring, he will graduate with a double major in astronomy-physics and physics, along with a math certificate.

“I got into astronomy as a backup plan if pre-med didn’t work out. I ran with it and never looked back,” says Nick. “I love the Astronomy Department. It’s a good size. The people are great, and I’m comfortable speaking with my professors,” he adds.

Born and raised in Plymouth, Wisconsin, Nick enjoys running, biking and swimming to stay fit and active. He also likes the Badgers when they’re winning, going to Badger games and watching Packer games. “I’m a Wisconsin-raised big football fan,” he says.

He received a UW Hilldale Award this spring and a Wisconsin Space Grant Award the last two summers for his research with Professor Stanimirovic.

Taking a radio image of a galaxy or gas cloud, they map out the turbulence in the gas. The higher the turbulence, the higher the energy. They think it’s coming from a star source and test it to see if that’s true. They gather their data from the GALFA HI Survey conducted at the Arecibo Observatory in Puerto Rico that maps neutral hydrogen.

He completed his Research Experiences for Undergraduates (REU) program at Eastern Tennessee State University this summer. Working with Professor Richard Ignace, who got his PhD at UW–Madison, he described how the polarization of light changes as it passes through a medium. From the amount of change detected, they can infer properties of the local magnetic field. “The coolest thing I did was write a simulation that depicts a supernova’s effect on the polarization of light in an environment that has different magnetic fields,” says Nick.

Nick is working on his research paper, which will be published in the

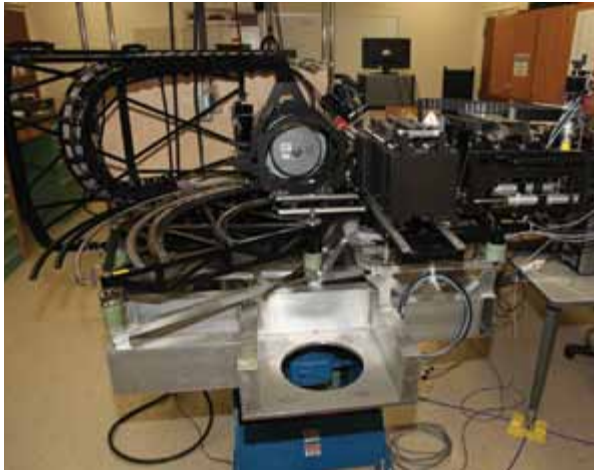


Nick Pingel at the Kitt Peak Observatory SARA Telescope

Journal of the Southeastern Association for Research in Astronomy (JSARA) undergraduate research journal.

He is taking the physics and general GRE tests this year and will apply to graduate schools this winter. He wants to pursue a PhD in astronomy, do research and teach.

Washburn Astronomical Laboratories Established



RSS-NIR is coming together in the lab.

A new chapter is about to be written in the annals of the Astronomy Department's significant contributions to astronomical instrumentation. This summer, department faculty and scientists voted to formally establish the Washburn Astronomical Laboratories, a new organization within the department dedicated to the development and implementation of astronomical instrumentation.

For five decades, the Space Astronomy Lab has had a distinguished and successful history of instrument development for satellites, rockets and space shuttle experiments. In recent years, the focus of many instrumentation projects has shifted more to ground-based astronomical instruments, many of which enhance the power of the department's observing facilities. This shift pointed to a new departmental organization—the Washburn Astronomical Laboratories. This name pays tribute to astronomy's historic beginnings at the University of Wisconsin.

"The Washburn Astronomical Laboratories will provide the continuing foundation for a vital and internationally recognized instrument development program within the department," says Professor Bob Mathieu.

The Laboratories' mission is to increase the department's scientific productivity and broaden its educational impact. It will be a focal point to increase the

breadth and depth of connections between the department's astronomical research and instrumentation programs; engage a larger percentage of the department in the scientific conception and productivity of our instruments; and help to strengthen the overall level of scientific discourse within the department.

"The department thanks the College of Letters & Science—especially Dean Gary Sandefur

and Associate Dean Eric Wilcots—for supporting our vision of the Washburn Astronomical Laboratories," says Department Chair Jay Gallagher. "The College guided us in designing its formal framework and accounting structure and has

"The Washburn Astronomical Laboratories will provide the continuing foundation for a vital and internationally recognized instrument development program within the department."

—Bob Mathieu

made a significant financial commitment to the Laboratories staff. This commitment is crucial for maintaining a talented and experienced technical staff to execute current projects and to propose the next innovative ideas. It is an important part of the most successful astronomical instrumentation programs at academic institutions around the country, and a necessary step in keeping UW–Madison among them."

"The flexibility of the funding from the College, which is not tied to a particular grant or project, enables creativity within the group. It allows the staff to spend time planning for the future by

doing feasibility studies of new instrument ideas and writing proposals to fund them. This is a very important step forward," says scientist Marsha Wolf, PI for RSS-NIR.

Current astronomy projects in progress by the Laboratories' staff include the Robert Stobie Spectrograph Near Infrared Arm (RSS-NIR) for the 11-meter Southern African Large Telescope (SALT); two new fiber integral field units (IFUs) for spatially resolved spectroscopy on the 3.5-meter WIYN Telescope (Hexpak and Gradpak); IFU prototypes and automated fiber bundle testers for MaNGA, a spatially resolved spectroscopic survey follow-up to the Sloan Digital Sky Survey at Apache Point Observatory; and the longstanding Star Tracker program for NASA rocket experiments.

The creation of the Washburn Astronomical Laboratories has been a multi-year endeavor, and many department members have contributed in important ways. "The creation of the Laboratories is only the beginning," says Mathieu. "I am confident that our future colleagues will recognize the work and the accomplishments of Wash Labs still to come as important contributions to our distinguished history of astronomical instrumentation and discoveries begun at the Washburn Observatory."

Please Keep in Touch

We'd like to hear from you.

Please send any news we can include in future newsletters or any changes in your contact information to: sanford@astro.wisc.edu or UW–Madison Department of Astronomy, 475 N. Charter St., Madison, WI 53706, Attn: Barb Sanford.

And tell us if you prefer to receive an electronic copy of the newsletter.



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News Notes

Congratulations, Graduates!

Undergraduates **Vincent Armentano**; **Ali Bramson** (pursuing PhD in Planetary Science at University of Arizona); **Edward Cheng** (pursuing PhD at Queens University, Kingston, Ontario, Canada); **Nitish Chopra** (doing research with Scientist Matt Haffner and applying to grad schools); **Ian Guinn** (pursuing PhD in physics at University of Washington, Seattle); **Edward Hayes**; **Hanna Herbst** (in Astronomy program at University of Florida); **Robert Hopkins** (Second Lieutenant, United States Marine Corps); **Timothy Hutchinson** (pursuing PhD in physics and astronomy at University of Utah); **Megan Jones** (teaching assistant at UW–Madison); **Elise Larson** (doing post-baccalaureate research at Macalester College, St. Paul, MN); **Alex Nathanson**; **Nadi Qutaishat** (teaching K–12 at Gyeonggi English Program in Korea [GEPK]); **Aaron Soffa** (at Integration Engineering, Kaukauna, WI); **Sara Stanchfield** (in Physics program at University of Pennsylvania); **Jacob Swan**; and **Adam Wright**.

Awards

Ali Bramson received the Raymond L. Doherty Award, given in recognition of a graduating senior's exceptional performance in astronomical research and in the classroom as an Astronomy major.

Nitish Chopra received the Thesis of Distinction Award for his senior thesis, supervised by Scientist Marina Orio.

Christopher Hilgenberg (Astronomy and Physics) received a UW Space Grant.

Claire Murray has received an NSF Graduate Fellowship.

Jesse Nims (Mathematics and Physics) received the UW Hilldale Award to do research on stellar tidal disruption by black holes and is working with Professor Ellen Zweibel.

Michael Ramuta (Astronomy and Physics) received a Wisconsin Space Grant Award.

Welcome, Grad Students

The Astronomy Department welcomes the incoming 2012–13 class of graduate students.

Erin Boettcher, BS astrophysics, Haverford College, Haverford, PA. Research interests: observational extragalactic astronomy, galaxy formation and evolution, and variable star studies. Working with Professor Ellen Zweibel to model the gas density sampled by cosmic rays propagating through the interstellar medium.

David French, BA physics and astronomy, Carleton College, Northfield, MN. Research interests: extragalactic astronomy and dynamics, specifically the interactions of galaxies with each other and their surrounding environments. Other interests: high-energy astrophysics, such as accretion onto supermassive black holes and AGN jets. Working with Dr. Bart Wakker on a large, low-redshift galaxy survey intent on advancing our understanding of galaxy-absorber interactions within clusters.

Alisha Kundert, BA physics, with astronomy minor, Vanderbilt University, Nashville, TN. Research interests: stellar populations and galaxy evolution. Other interests: stellar angular momentum evolution and the determination of stellar rotation periods from long baseline, low cadence light curves. Has worked on gyrochronology studies of stars with Dr. Keivan Stassun (PhD 2000).

Emily Leiner, BA astronomy, Wesleyan University, Middletown, CT, 2010. Worked in education and public outreach at Adler Planetarium, Chicago, IL. Undergraduate research focused on modeling light curves for transiting extrasolar planets. Other research interests: areas of stellar dynamics, formation and evolution.

Departures

The department's first Grainger Postdoctoral Fellow, **Alyson Brooks**, has

accepted a faculty position at Rutgers University beginning next fall.

John Everett has left the department to become a research faculty member and Director of Operations for the Center for Interdisciplinary Exploration & Research in Astrophysics (CIERA) at Northwestern University, Evanston, IL.

Ed Mierkiewicz has accepted a faculty position at Embry-Riddle Aeronautical University that will begin in January. He was instrumental in leading UW's REU program.

Department News

The Department of Astronomy is pleased to announce that **Professor Jay Gallagher** has been appointed Department Chair for the coming year. Many thanks to former Chair Bob Mathieu for his four years of dedicated service to the department.

Assistant Professor **Elena D'Onghia's** spiral arm movie was selected for exhibition at the Kimball Art Center, home of the Sundance Film Festival, in Park City, UT.

Board of Visitors News

The department welcomes **Jeff Diermeier** (Chairman, L. B. White Company) and **Anne Kinney** (Solar System Exploration Division Director, Goddard Space Flight Center, NASA) to its Board of Visitors and mourns the passing of emeritus BOV member **David Beckwith**.

Alumni News

Matthew Povich (PhD 2009) is the newest Assistant Professor of Physics and Astronomy at Cal Poly Pomona. He was an NSF Postdoctoral Fellow in Astronomy and Astrophysics at Pennsylvania State University.

Elizabeth Wehner (PhD 2005) has accepted a faculty position at St. Thomas University in St. Paul, MN to begin next year. She is currently a Visiting Assistant Professor at Haverford College.



Autumn leaves cover the ground in front of the Washburn Observatory.



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DEPARTMENT OF
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Hundreds of people gathered at UW-Madison's historic Washburn Observatory to view the transit of Venus on June 5th. The public was able to view the transit with the newly refurbished 15.6-inch refracting telescope, as well as other dedicated telescopes set up outside.

In this rare astronomical event, the planet Venus crosses the disk of the Sun, blocking just a little bit of Sun light. The Earth's and Venus' orbits line up so that Venus appears as a dark dot that slowly crosses the Sun over the course of several hours. It is much like a solar eclipse, except that Venus is too small to darken the Sun completely, as the moon would during a solar eclipse.

The Washburn Telescope is among the handful of operational public telescopes to observe both the 1882 and 2012 eclipses. This rare event will not occur again until 2117.