The Washburn Observer

DEPARTMENT OF Astronomy
UNIVERSITY OF WISCONSIN-MADISON

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A GLIMPSE of the Galactic Plane

Inside This Issue

When Professor Ed Churchwell and senior scientist Barb Whitney first proposed to survey the inner regions of the Milky Way disk with the Spitzer Space Telescope in 2000, they never dreamed it would be so successful and would grow into several GLIMPSE (Galactic Legacy Infrared Mid-Plane Survey Extraordinaire) surveys spanning the entire 360 degrees of the Galactic plane. "GLIMPSE has produced the most spectacular panoramic images of the Galactic plane," says Churchwell.

GLIMPSE is a survey of the Milky Way Galaxy in which we reside. The images come from the IRAC (Infrared Array Camera) instrument on board the Spitzer Space Telescope, one of NASA's four Great Observatories. "These surveys have 100 times the sensitivity and over 10 times the resolution of previous surveys, allowing us to see stars and dusty objects throughout most of the Galaxy for the first time," says Churchwell. "It's like putting on eyeglasses for the first time (if you are nearsighted) or viewing a distant object with binoculars," adds Whitney.

Star formation in RCW49. One of the most prolific birthing grounds in our Milky Way Galaxy, a nebula called RCW49 is exposed in superb detail for the first time in this image from NASA's Spitzer Space Telescope. Located 13,700 light-years away in the southern constellation Centaurus, RCW49 is a dark and dusty stellar nursery that houses more than 2,200 stars. This image, taken by Spitzer's infrared array camera, highlights the nebula's older stars (blue stars in center pocket), its gas filaments (green) and dusty tendrils (pink). Speckled throughout the murky clouds are more than 300 never-before-seen newborn stars. Photo credit: NASA/JPL-Caltech/E. Churchwell, UW.

Using the IRAC camera, with a wavelength range of 3.6 to 8 microns, short exposures of only seconds were used to allow for the largest mapping area in a reasonable time on the telescope.

The various GLIMPSE surveys (GLIMPSE, GLIMPSE II, GLIMPSE3D, GLIMPSE 360 and Deep GLIMPSE) have to date mapped an area of 960 square degrees, producing beautiful panoramic images of the Galactic plane and catalogs of more than 160 million objects. The GLIMPSE team — including principal investigators Churchwell, Whitney and Bob Benjamin (UW-Whitewater), and researchers Marilyn Meade and Brian Babler — has worked diligently to produce these high-quality images and catalogs. It has also processed Spitzer and Herschel data for the Large and Small Magellanic Clouds. Thousands of new HII regions and young stellar objects have been identified in the GLIMPSE images; more than 414 scientific articles have been published to date using GLIMPSE data.

"GLIMPSE has produced the most spectacular panoramic images of the Galactic plane."

— Ed Churchwell

Infrared light can penetrate the dust that obscures much of the Galaxy, so infrared telescopes let us see what would otherwise be invisible. Visible-light telescopes may only see 5 percent of the way to the other side of our Milky Way, while Spitzer can see all the way through. Infrared telescopes can reveal dust heated by supernovae, or peer inside the stellar nurseries where new stars are being born. Astronomers are interested in studying these newfound proto-stars further because they offer a fresh look at star formation in our own Galaxy.

Wisconsin's proposal was selected as one of six Legacy programs. "When

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Letter from the Chair

Bob Mathieu, Astronomy Department Chair

Spring is a fun time in the department — a time of rejuvenation as we bring prospective graduate students to Madison for visits and court new post-doctoral researchers for the coming fall. Graduate students who choose to come to Wisconsin will be with us for the next five to six years, and post-docs for three-plus years. So we begin new long-term relationships with young people who will become important members of our community, and who will shape us as much as we shape them.

Graduate student recruitment has changed a great deal since I applied to schools in 1978. Of course, much of the change is the new way in which applicants obtain information. This is why we recently invested heavily in a new department website: to ensure that information about who we are is current, easily accessible, welcoming and attractive.

More fundamentally, it has become a major *recruitment* process. In the summer of 1977, I went on a (self-funded!) road trip to visit schools that I was interested in. "Recruitment" consisted of a phone call in the spring from a faculty member or two at universities where I had been admitted. Today, schools fly in admitted graduate students for a three-to-four-day visit in the spring, and Madison is often one stop on a multi-university tour. Those of you who remember Madison in February and March will understand our trepidation as we take visiting students to the airport for flights to Tucson, Santa Cruz or Hawaii!

Our current graduate students are so important in making the UW and Madison shine brightly. They are represented in the admission process itself, which is a valuable professional development opportunity for them. They organize the visits and often host the "prospies" in their homes. Perhaps most importantly, their words and counsel impact decisions as much as conversations with faculty.

Because many undergraduates have one or more research experiences these days, the January American Astronomical Society meeting has become a major occasion for first meeting prospective students. The UW has led the way with its now famous "Wisconsin dinner." The department invites junior and senior undergraduates, who are joined by our graduate students, post-docs and faculty who are attending the AAS meeting. We often take over a good part of a restaurant, and this year, more than 40 undergraduates went to experience Wisconsin hospitality firsthand!

For our many international applicants, the process often is not so different from 1977, because few have the opportunity to visit the campus. These students bring wonderful talent and diverse perspectives to our department, and we do all that we can to welcome them and to help them in their decisions. I am always impressed when a student flies around the world to begin a new life in a place that she or he knows very little about. We are so thankful that they are willing to do so.

When students visit, my counsel to them is always to find the place that suits them, and where they will be happy for many years of their 20s. The UW is a wonderful place scientifically, and so are the other top-ranked schools with which we are "competing." After all, we work with colleagues at those schools! So the key to the recruitment process is to ensure that the prospective students know who we are, understand what makes us unique and special, and most importantly, make the right decision for themselves. When that happens, a bright future with the new graduate student begins for all of us!

Bob Mathieu
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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If you wish to make a tax-deductible gift to the Department of Astronomy fund, which allows the department to support special opportunities for students, staff and faculty, you may contribute online at www.astro.wisc.edu (click on Friends & Alumni, Make a Gift) or send a check, payable to the UW Foundation, to: UW Foundation, US Bank Lockbox 78807, Milwaukee, WI 53278-0807. Questions may be directed to Department of Astronomy Chair Bob Mathieu, mathieu@astro.wisc.edu, (608) 262-8689; or UW Foundation Director of Development Chris Glueck, (608) 265-9952, chris.glueck@supportuw.org.

For Blakesley Burkhart, the Turbulent Life Is the Good Life

Blakesley Burkhart hang gliding in Rio de Janeiro, Brazil.

Growing up in Louisville, Kentucky in the 1990s as the daughter of a fifth-grade school teacher and thoroughbred race horse trainer, Blakesley Burkhart found it easy to fall in love with astronomy.

"These were the golden years of the Hubble Space Telescope and the Mars Pathfinder," she says. "And the coming of the Internet made it easier for the public to feel a part of the latest discoveries of the universe."

"The more people are aware of the scope of the grand universe of which they are a part, the more we will come together as a human race."

— Blakesley Burkhart

Following this passion, Blakesley majored in physics and applied mathematics at the University of Louisville and came to the UW in 2007 as a Research Experiences for Undergraduates (REU) student. Her project with Professor Alex Lazarian went well, and she published her first paper in the *Astrophysical Journal*. During that summer she fell in love with research on the interstellar medium — and with Madison — and decided that the UW was the place to do her graduate studies.

Now a fourth-year graduate student, she's working with Professor Lazarian, trying to better understand turbulence in the interstellar medium and magnetic fields by connecting observations, numerical simulations and theory. "Studying magnetic turbulence is of critical importance to so many different aspects of astronomy, and it also encompasses some of the most beautiful theories in all of physics," she says.

Blakesley sees a vast opportunity to make a positive impact on people's lives by sharing her love of science with them. She believes that astronomy has huge societal benefits. "The more people are aware of the scope of the grand universe of which they are a part, the more we will come together as a human race and abandon tribalistic tendencies. If everyone realized just how alone we are in the vastness of space and how precious our planet is, we might be kinder to each other and to the Earth," she says.

Blakesley is involved in astronomy outreach around the world. She attended the 2010 Communicating Astronomy with the Public conference in South Africa, where her talks about the department's Universe in the Park and Washburn Observatory programs gained international attention, and then did demonstrations at SciFest Africa 2010 for thousands of South African educators and children. She has also done outreach in Indonesia, where she chatted with girls in the small village of Pati, Java about science, being a woman in science and going to college.

Closer to home, Blakesley's outreach efforts are felt throughout the state of Wisconsin. As the department's current outreach coordinator, she hosts a weekly show, "In Our Backyard: Radio Astronomy," on Madison's community radio station WORT; gives talks at Space Place; is active in the Universe in the Park program; is involved in the annual Expanding Your Horizons program for middle-school girls; and participates in the annual Physics Fair and science exhibitions. She has done demonstrations and discussed careers in science at several Madison-area schools; is a coordinator for the Women of Wisconsin Strengthening Astronomy (WOWSA) group, which promotes women in astronomy; and was a Madison Middle School Science Symposium mentor last year. Her love of teaching also led her to obtain a master's degree in physics in order to prepare for future faculty positions in a wide range of colleges and universities.

Blakesley's life is full of turbulence beyond her involvement in research and department activities. She loves to travel, and her studies have taken her to spots on five continents, including Brazil, Europe, Indonesia, South Africa, Costa Rica and Arizona. "If you have a travel bug, astronomy's a great field to be in," she says. Her future plans include finishing her PhD and getting a post-doc. In her spare time, she loves riding her Kawasaki Ninja motorcycle, is a certified yoga teacher, does Bikram/Vinyasa yoga, brews beer and plays ultimate Frisbee. She's a captain of the Einstein Ringers ultimate Frisbee team, composed of mostly astronomy and physics grad students. The name is a play off of the gravitational lensing phenomenon and the Frisbee term *ringer*, which means a very good player.

Blakesley's list of awards is extensive. She received the 2011 Jansky Award for her outstanding accomplishments in research as a grad student, NASA's Wisconsin Space Grant Fellowship, a National Science Foundation Graduate Research Fellowship in Astrophysics, and a NASA Outreach Award for her department blog, madtownastro.com.

"Coming to the UW was one of the best decisions of my life," says Blakesley. "I'm very happy here and love the department and all the opportunities it provides for its students."

Grad Student Assesses Student Learning in Planetarium

Sebastian Heinz

Students learn about the motions of the Sun and stars in the UW-Madison planetarium.

Do students learn more about the motions of the Sun and the stars in the sky when they're in the planetarium or in the classroom?

That's the question that graduate student Paul Sell set out to answer in his "Assessing Student Learning in the Planetarium" research study during the fall semester. Based on his findings, the short answer is a surprising "No."

Over a nine-week period, Paul carried out the various parts of the study for each discussion section in the three introductory Astronomy 103 classes offered that semester. He taught the students the material, administered a short survey after their experience and administered pre- and post-tests three weeks before and after the teaching. Scientist Eric Hooper served as his advisor.

"This was learning in action."

— Paul Sell

Each of the three classes learned with different teaching tools or were in a different environment. Paul taught two classes in the UW-Madison planetarium — one with demos and one without — and taught the third class in a classroom setting with a PowerPoint presentation and demos. Each class had six weekly discussion sections.

While Paul was the teaching assistant for one class, students in the other two classes didn't know him. "To break the ice in those classes, I would chat with the students for a few minutes beforehand and ask them simple questions, such as which figurine (Yoda or Homer Simpson) I might use in my demonstrations," he explains. "This set the stage for them to get involved and respond to me throughout the class."

Paul integrated active learning into his discussion section by asking students to predict where the Sun and the stars in the sky would be and where they would go in the sky during the day and the year. By raising an arm over their heads to point at locations in the sky, students were able to show that they were following along with the explanations. "This was learning in action," says Paul.

The results were surprising. The students all improved their scores by the same amount — 10 to 20 percent on average from pre- to post-test — with no increased improvement for those learning in UW-Madison's planetarium. "My hypothesis was that the planetarium is a better learning environment than the traditional classroom," says Paul. "Based on content tests that I administered three weeks before and after I taught the material, I expected an increased improvement in students' scores in the planetarium versus the classroom."

Students did indicate that they enjoyed their experience in the planetarium much more than being in the classroom. "This 'wow' factor is something that cannot be encapsulated by the content tests, especially over only a few weeks," Paul explains.

As with all first research, there are multiple ways to interpret the results and, of course, there are more questions. "A solid conclusion is that we need to consider ways that we can make this teaching tool more effective," says Eric.

The study (Institutional Review Board protocol #SE-2011-0550) is part of Paul's internship with the Delta Program, UW-Madison's program for preparing future faculty to be excellent teachers as well as excellent researchers (www.delta.wisc.edu). His interest in using the planetarium arose from his 3-1/2 years of experience working at the University of Toledo's [Ohio] Ritter Planetarium, where, as an undergraduate, he gave hundreds of presentations to the public.

"I enjoy thinking about and improving my teaching skills, both for my own personal satisfaction and for the benefit of my students," says Paul. "I can't imagine taking a future position without at least some teaching component."

Paul presented his initial results in a poster session at the American Astronomical Society meeting in Austin, Texas in January. He and Eric Hooper will continue to analyze the data they have collected thus far to look for additional interesting results. Upon completion, they plan to submit their results to an education research journal.

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

Awards

Department chair **Bob Mathieu** has been named a Fellow of the American Association for the Advancement of Science (AAAS) for fundamental research on star clusters, binaries and star-forming regions; community service and leadership of the WIYN Observatory; and innovation in STEM education.

Professor **Alex Lazarian** has been selected as a Vilas Associate by the UW-Madison Graduate School for his outstanding research work on the effects of magnetic fields on star formation.

Graduate student **Blakesley Burkhart** has received the 2011 Jansky Award for her outstanding accomplishments in research on turbulence (see story on page 3).

Graduate student **Min-Young Lee** has received the 2011 Stebbins Award for her significant research achievement in understanding the relative abundances of neutral and molecular hydrogen in star-forming regions.

Graduate student **Kat Barger** has accepted a prestigious National Science Foundation Astronomy and Astrophysics Postdoctoral Fellowship. She will pursue her research on the Magellanic System and galactic halo gas at the University of Notre Dame (South Bend, Indiana), where she will work with Professors Nicolas Lehner and Chris Howk (both previously in the UW Astronomy Department!).

Graduate student **Greg Mosby** received the Chambliss Student Award for his poster presentation at the American Astronomical Society meeting in Austin, Texas in January. It depicted his research on improving stellar population modeling of active galaxies.

Graduate student **Thiem Hoang** has accepted a CITA Fellowship and will move to Toronto, Canada this fall. His research interests are CMB foregrounds, the study of magnetic fields via FIR and submm polarization by aligned dust grains, acceleration of dust grains and modeling line radiative transfer.

Graduate student **Nick Hill** has won an NSF East Asia and Pacific Summer Institutes Fellowship to work in Canterbury, New Zealand. He works with pulsating, binary and patchy stars and the use of graphical processing units to analyze their spectra. He also dabbles in stellar magnetospheres.

New Faculty

The Astronomy Department welcomes new assistant professor **Elena D'Onghia** this fall. She's currently a Keck Fellow at the Harvard-Smithsonian Center for Astrophysics in Cambridge, Massachusetts, where her research focuses on the dynamics of galaxies. She wants to learn about fundamental physics by studying the dynamics and formation of galaxies using analytic methods and numerical simulations. Her recent research includes groups of dwarfs, resonant stripping, tidal interactions and tail-making, disk shocking in the Milky Way and stochastic spiral arms.

Welcome, Grad Students

Britt Lundgren and **David Wake** will be starting as post-docs in October. They are currently post-docs at Yale University. Britt, an expert on quasar absorption lines, is coming on an NSF Fellowship. David, an expert on galaxy clustering, will work with Professor Christy Tremonti.

Alumni News

Margaret Turnbull, BS 1998, was named in *Wired* magazine's "Smart List 2012: 50 people who will change the world." She worked with Bob Mathieu and research scientist Barbara Whitney as an undergrad and is now doing astrobiology from her home in northern Wisconsin.

Lou Nigra, PhD 2012, is a new project scientist with the Adler Planetarium's Citizen Science department in Chicago. He is working on the SETI Live project, part of the "Zooniverse" group, which creates web-based, interactive, participatory science projects.

Departures

Former Professor **Andrew Sheinis** is now head of instrumentation at the Australian Astronomical Observatory (AAO), with an adjunct professorship at the University of Sydney. We wish him all the best in his new position.

"Glimpse" continued from page 1

our project was selected, there was some concern that 1) our group did not have sufficient infrared expertise to carry this out, and 2) we would burn out the camera detectors because the Galactic plane was so bright," says Whitney. "So… Let's just say we got grilled a lot and were tasked with the nearly impossible goal of producing a 99.5 percent reliable catalog.

Not knowing any better, we delivered what was asked for, on time and within budget. The GLIMPSE project was so successful that we got many follow-up surveys awarded. It's a classic rags-to-riches story. We're proud of the job we've done, and everyone in Wisconsin can be proud as well."

The Spitzer Space Telescope is a NASA mission managed by the Jet Propulsion Laboratory. The Spitzer Science Center, located on the campus of the California Institute of Technology, is part of NASA's Infrared Processing and Analysis Center.

The GLIMPSE survey is one of the permanent displays at the Adler Planetarium in Chicago. For more detailed information on GLIMPSE, visit the website at www.astro.wisc.edu/glimpse/.

David Koch Searches for Habitable Planets

David Koch at Cape Canaveral, next to the Delta II rocket used to launch Kepler.

David Koch is a graduate of the UW Applied Mathematics, Engineering and Physics (AMEP) program and was deputy principal investigator for the NASA Kepler Mission until his retirement last year. We feature him here to honor his many important contributions to the field of astronomy.

For Koch, nothing is more exciting than reviewing all the fantastic Kepler data to discover Earth-sized planets. He suggested that the mission be named in honor of Johannes Kepler, the 17th-century mathematician and astronomer who discovered the laws of planetary motion.

In 1992, Koch began working on the mission concept with principal investigator Bill Borucki and developed the high-precision technology demonstration proof of concept for the mission. By precisely measuring the light variations from thousands of distant stars, they view the region of the Milky Way Galaxy in the Cygnus-Lyra constellations to search for Earth-sized planets in or near the habitable zone. They proposed the mission four times beginning in 1994 before being competitively selected by NASA in 2001.

Borucki, who first developed the idea for the project, is also a Wisconsin native who attended the UW and worked for NASA. He developed the transit method of studying planets that involves measuring dips in the brightness of a star when a planet crosses in front of it. The planet itself isn't seen — only its effect on the brightness of the star.

Koch helped to conceive, design and develop the NASA mission. Kepler-22b is its first planet in the habitable zone of a solar-like star. The star is 600 light years away from Earth, the radius of the planet is twice the radius of the Earth, and the planet orbits the star every 290 days. Nothing is known yet about its surface and atmosphere. "After two years of data taking, it is only now possible to reap the fruits of our labor: planets with orbital periods similar to that of Earth — that is, those that might have liquid water on their surface," says Koch.

The telescope, about the size of a minivan, follows the Earth in its orbit around the sun. It has a field of view of over 100 square degrees, about equal to two dips from the Big Dipper. Steadily gazing at 150,000 stars and looking for tiny eclipses caused by planets, it has discovered more than 2,300 possible planets, including 48 that exist in the habitable zone where life is possible. "We have also found a substantial fraction of the planets to be in multi-planet systems, allowing us to measure transit timing variations and to do dynamical studies," says Koch.

In addition to an abundance of results on exoplanets, Koch states, "Kepler is providing an unprecedented photometric database in terms of precision, duration, contiguity and number of stars. These data are being used by more than 500 astronomers worldwide in such fields as asteroseismology, gyrochronology and eclipsing binary research."

"After two years of data taking, it is only now possible to reap the fruits of our labor — planets with orbital periods similar to that of Earth."

— David Koch

Koch worked in the Space Physics Lab for Professor William Kraushaar and received a bachelor of science degree in Applied Mathematics, Engineering and Physics (AMEP) from UW-Madison in 1967. He attended grad school at Cornell University, where he earned a master's degree in 1971 and a doctorate in 1972, both in physics, building a balloon-borne gas Cherenkov telescope to detect for the first time high-energy pulsed gamma rays from the Crab pulsar. He then worked as project scientist on X-ray astronomy satellites Uhuru and Einstein at American Science and Engineering, Inc. for five years, and on infrared and sub-millimeter space projects at the Smithsonian Astrophysical Observatory in Cambridge, Massachusetts.

In 1988, Koch moved to NASA's Ames Research Center in California to work on SIRTF (which later became the Spitzer telescope) and on SOFIA. He initiated one of NASA's first educational and public outreach programs as part of the Kuiper Airborne Observatory and led a significant EPO program for Kepler.

Koch retired last August due to his declining health. He is battling ALS, Lou Gehrig's disease. Born in Milwaukee, he returned to his home state of Wisconsin to be close to his family. He still keeps up with the Kepler project.

Department Feels Like Home to Megan Jones

When the mountain at Kitt Peak caught fire and Megan Jones was awakened at 4 a.m. and told to evacuate, she knew that the field of astronomy was going to be a great adventure.

She was a freshman at the time. It was her first summer at the UW and her second night of observation at the WIYN telescope.

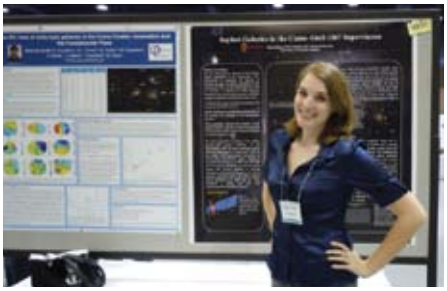
Now a senior majoring in astronomy and physics, with a certificate in classics, Megan does research with Professor Eric Wilcots, as she has done since she was a freshman. She is looking at the Seyfert galaxies in the Coma-Abell 1367 supercluster and studying their occurrences, patterns and environmental dependencies. Her senior thesis will be on this topic. "Black holes do weird things," she says. "I'm very interested in gravity and the incredible things it can do when you have enough mass."

Megan got involved in astronomy at a young age. "I like knowing how things work. It's how I first got involved in astronomy and physics. I liked astronomy as a child and was science oriented," she explains. "My dad and I looked at the stars, printed out star charts and looked at the stars with binoculars. He bought a telescope for the family, and we printed out maps of moon craters and mountain ranges and looked for them through the telescope."

Born in Racine, Wisconsin, Megan is also a ballroom dancer on the UW's Madtown Ballroom team. She teaches free beginning lessons weekly and performs at campus and charity events, including those benefiting the March of Dimes and the UW Children's Hospital. She is also vice president of the Physics Club and has tutored students in the introductory physics classes. She used to do tae kwon do and is a second-degree black belt.

Megan studies Russian at the UW and studied abroad in Kazan, Russia this past summer as part of the U.S. Department of State's Critical Language Scholarship Program. There she lived with a host family and learned the culture and language. In the summer of 2010, she did a National Radio Astronomy Observatory (NRAO) Research Experiences for Undergraduates (REU) program at the Green Bank Telescope — the largest manmade steerable object on land — in Green Bank, West Virginia. There she worked on astrochemistry, detecting molecules in space using the GBT. She has presented her research at American Astronomical Society (AAS) conferences.

Megan has received several awards, including the Bernice Durand Research



Megan Jones

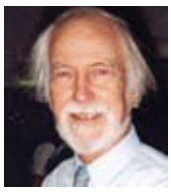
Scholarship and Wisconsin Space Grant Consortium scholarships and research grants.

She will be applying to graduate schools this fall and is looking at schools all over the country as well as in Australia and South Africa. She wants to study the effects of extreme gravity, based on her study of active galactic nuclei (AGNs).

Megan is happy with her decision to do her undergraduate studies in Madison. "The UW is undergrad and research friendly," she says. "There are always opportunities to get more involved. My advisor encouraged me to get out there and find scholarships and attend conferences."

"I am glad that I started my research early on and got to know people right away," she says. "The department feels like home."

Make a Gift in Honor of Mary and Art Code



Mary and Arthur Code have forever left their mark on the UW Astronomy Department. "They were the pillars of the department for 30 to 40 years," says department chair Bob Mathieu.

Mary, the wife of the noted astrophysicist, passed away last August at the age of 88. She and Art, who died in 2009, were married for 65 years. After retiring, they moved to Tucson, Arizona and returned to Madison in 2007.

Mary worked as a social worker in the field of adoptions for more than 30 years at both the Children's Service Society of Wisconsin and Catholic Social Services in Madison.

Art spent more than 40 years in the UW Astronomy Department. He came in 1950, left in 1956 to join the faculty at the California Institute of Technology, and returned to the UW as the last director of the Washburn Observatory.

A pioneer in space astronomy, he founded the Space Astronomy Laboratory, which is responsible for building telescopes and instruments to fly in space; built the world's first successful orbiting observatory, the Orbiting Astronomical Observatory (OAO), launched in 1968; and was the founding director of the Space Telescope Science Institute. He also developed and operated a Space-Shuttle-borne ultraviolet telescope, WUPPE (Wisconsin Ultraviolet Photopolarimeter Experiment) in 1990 and 1995 as part of NASA's Astro missions.

In honor of Mary and Art, the Code family has set up an endowment fund for the department called the Arthur and Mary Code Fund. You may send a contribution to the UW Foundation, US Bank Lockbox 78807, Milwaukee, WI 53278-0807, or make an online donation at: supportuw.org/making-a-gift/.

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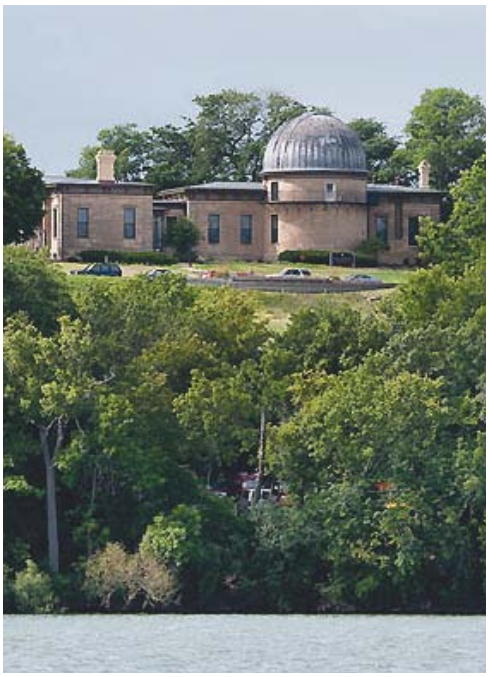

Jeff Miller, University Communications

Pictured from Lake Mendota, the recently renovated Washburn Observatory sits atop Observatory Hill.

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Board of Visitors

The Department of Astronomy Board of Visitors, along with spouses and friends, toured the Arecibo Observatory on February 27. From left to right: Jere Fluno (chair), Lewis Leavitt, Ken Ciriacks, Anne Fluno, Judith Leavitt, Peter Livingston, Barb Sanford (development specialist), Bob Terrell, Chris Glueck (UW Foundation representative), Caryl Terrell, Min-Young Lee (graduate student) and Bob Mathieu (department chair).

The observatory opened in November 1963. At a diameter of a thousand feet, it still has the largest single-aperture telescope ever built. Located near the city of Arecibo in Puerto Rico, the telescope is close to the equator, which enables it to "see" (via radio waves) all the planets in the solar system. It's provided the first full imaging of an asteroid and has also led to the first discovery of planets outside our solar system.