The Washburn Observer

DEPARTMENT OF Astronomy
UNIVERSITY OF WISCONSIN–MADISON

Volume 3, No. 2 • Fall 2013 • www.astro.wisc.edu

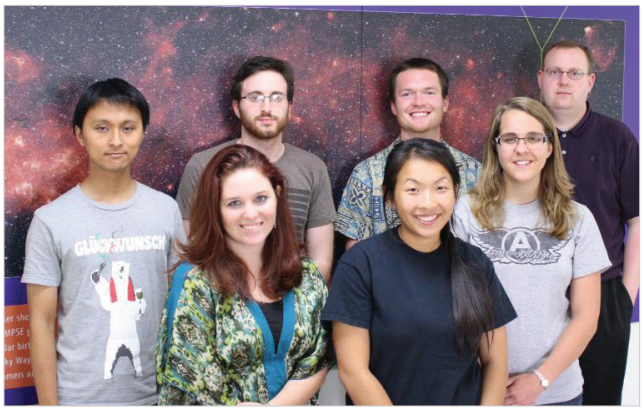
New Faces in the Department This Fall

Inside This Issue

The Astronomy Department welcomes the incoming 2013–14 class of graduate students, visiting faculty and postdocs.

Elijah Bernstein-Cooper has a BS degree in physics, with an astronomy emphasis, from Macalester College in St. Paul, Minnesota. He is working with Professor Snezana Stanimirovic to answer what role atomic hydrogen plays in the formation of molecular hydrogen in giant molecular clouds.

Yi-Hao Chen has an MS degree in astrophysics from Ludwig-Maximillian University in Munich, Germany and a BS degree in physics from National Taiwan University in Taipei. He is working with Professor Sebastian Heinz on studying the effect of magnetic fields on propagation of jets from compact objects.



The incoming 2013–14 class of graduate students: from left, Yi-Hao Chen, Charee Peters, Stephen Pardy, Elijah Bernstein-Cooper, Andrea Vang, Brianna Smart, and Tim Haines

Tim Haines has a BS degree in physics, mathematics and computer science, with an electrical and computer engineering emphasis, from the University of Missouri in Kansas City. He is working with Professor Elena D'Onghia on using graphics processing units to increase the speed and resolution of both cosmological-scale and galactic-scale simulations.

Stephen Pardy has a BS degree in physics from Macalester College in St. Paul, Minnesota. He is involved in projects on the atomic and molecular ISM in galaxies. He is working with Professor Elena D'Onghia.

Charee Peters has an MA degree in physics from the Fisk-Vanderbilt Masters-to-PhD Bridge Program and a BS degree in physics from the University of Denver (Colorado). She is working with Professor Eric Wilcots on observing HI regions (interstellar clouds of neutral hydrogen) in intermediate galaxies to better understand star formation, galaxy formation and evolution, and/or cosmic magnetic fields.

Brianna Smart has a BS degree in astronomy and physics from the University of Arizona in Tucson. She is working with senior scientist Matt Haffner on studying the ISM using the Wisconsin H-Alpha Mapper (WHAM).

Andrea Vang has a BA degree in physics from Carleton College in Northfield, Minnesota. She is working with senior scientist Marsha Wolf on observations of post-starburst galaxies.

Associate Professor Tony Wong from the Department of Astronomy at the University of Illinois at Urbana-Champaign is a fall sabbatical visitor. He has previously held research positions at the Australia Telescope National Facility and the University of New South Wales. He primarily studies the interstellar medium (ISM) in nearby galaxies and its relation to star formation. Specifically, his research interests include the global structure of the ISM in disk galaxies, studies of the ISM in the Large Magellanic Cloud, and molecular line mapping of GMCs in the galaxy. Born in Lawrence, Kansas, he is a U.S. and Australian citizen. He received an MA

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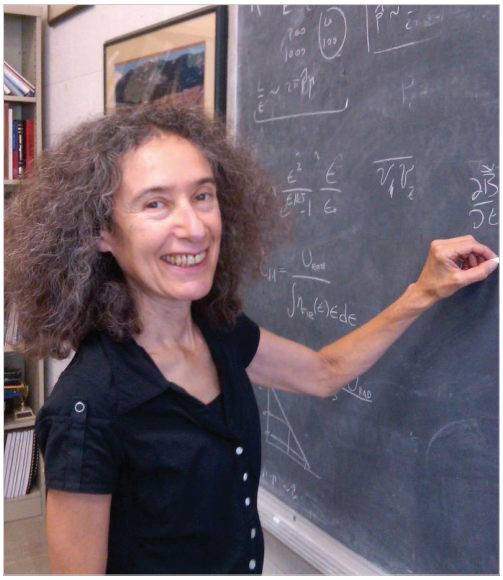
Letter from the Chair



Ellen Zweibel, Astronomy Department Chair

The start of the fall semester always brings a surge of energy, and for the UW Astronomy Department this year, a sense of newness. We have a new department chair (me), a new dean (John Karl Scholz), and a new chancellor (Rebecca Blank). The latter two are economists, and I am a theoretical astrophysicist with a specialty in plasma astrophysics.

Though just a few months into my three-year term as chair, I already have much to learn. The overarching goal is simple. My job is to help the Astronomy Department do its job — the best research, teaching, and outreach that we're capable of doing. We have great ingredients: telescopes, computers, coffeemakers of every description, and above all, talented and energetic people of all ranks — from undergraduates to senior scientists and faculty, supported by excellent staff.

Our success is due in part to being embedded in a great university. We're connected to the Physics Department through our joint interests in high-energy astrophysics, pursued through programs in cosmology, x-ray astronomy, the IceCube project, and the recently formed Wisconsin IceCube Particle Astrophysics Center. We're also connected to Physics and the College of Engineering through the plasma physics program, which explores the interaction between ionized gases and electromagnetic fields in both astrophysical and laboratory settings. We overlap with the Mathematics, Statistics, and Computer Science Departments through gas dynamics, plasma physics, handling of large data sets, and innovations in hardware. We share an interest in planets — here in the solar system and orbiting other stars — with the Atmospheric and Oceanic Sciences and Geoscience Departments. Our popular Life in the Universe course (Astronomy 160) — team-taught by astronomy, biology, and geology faculty — is just one example of how interdepartmental synergism helps to enrich the campus. In the next few years, we'll be discussing options for broadening our undergraduate major to give our students more opportunities to study and work at the boundaries of different disciplines. Allied programs in the School of Education help us to educate more effectively, and to help our graduate students become better educators.

We have bonds with other Wisconsin institutions as well. Three faculty members from other UW campuses have visitor appointments that bring them to the department regularly, and we're launching an astronomy course taught jointly with faculty at the College of Menominee Nation (CMN) in Keshena that will be open to CMN and UW students alike.

Finally, academic exchanges are great opportunities to broaden our scope. In addition to our weekly Colloquium speakers and short-term visitors, this fall we're delighted to host Maggie Turnbull, an independent scholar who researches methods for finding planets that can support life, and sabbatical visitor Tony Wong, a radio astronomer from the University of Illinois at Urbana-Champaign who works on star formation in other galaxies. Alex Lazarian and Bob Mathieu have returned from their sabbatical leaves with fresh perspectives, while Matt Bershady and Snezana Stanimirovic have just begun theirs.

Enjoy the rest of this newsletter, and best wishes for the fall season.

Ellen Zweibel
Astronomy Department Chair

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Questions may be directed to Department of Astronomy Professor Bob Mathieu, mathieu@astro.wisc.edu, (608) 890-3767 or UW Foundation Director of Development Chris Glueck, chris.glueck@supportuw.org, (608) 265-9952.

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John Chisholm Bitten by Astronomy and Travel Bugs

John Chisholm is certainly not the first graduate student to be bitten by both the astronomy and travel bugs. Nor is he likely to be the last.

This past summer, John was one of 29 visiting international students at the Summer Institute in Taiwan. Under a National Science Foundation (NSF) East Asia and Pacific Summer Institutes for U.S. Graduate Students (EAPSI) Fellowship, he worked with research fellow Satoki Matsushita at the Academia Sinica, learning how to do submillimeter data reduction in his study of stellar feedback in the life cycle of gas.

John also has the distinction of being the department's only current graduate student who's been to the Southern African Large Telescope (SALT). As part of the Fabry-Perot commissioning team, he went with scientists Marsha Wolf and Eric Hooper to characterize the instrument and learn how it works after his first year of graduate study.

His research interests are observational galactic evolution, specifically feedback processes that help to regulate star formation and shape the evolution of galaxies over the course of cosmic time. Now in his fourth year, he is working with Professor Christy Tremonti to see how optical and radio morphologies of galactic outflows correspond.

John Chisholm hiking at Tre Cime (Three Peaks) in Sesto, Italy

"Small-scale events like supernovae add energy to the surrounding interstellar medium, heating it up and stopping stars from forming out of cold molecular gas," he explains. "This ties in with the project that I'm doing now, looking at cold molecular and hot ionized gas and seeing the connections and interactions between the two." He was awarded a Hubble Space Telescope grant for the core part of his thesis work on outflows and the interaction of the temperature phases of outflows in many galaxies with a wide range of properties using the Hubble Cosmic Origins Spectrograph (COS).

"I like to open people's eyes to the wonders astronomy has to offer."

— John Chisholm

John grew up in Madison. It was an astronomy course in his senior year at West High School that intrigued him. "I always liked math and science, and to see the puzzle of big galaxies was fascinating to me," he recalls. He begged his dad to buy him a telescope, and his interest in astronomy was piqued. He received a BS in physics from Boston College, which didn't offer an undergraduate degree in astronomy.

He did a Research Experiences for Undergraduates (REU) program in physics at UW-Madison with Professor Jim Lawler, calculating transition probabilities of rare-earth elements needed to calibrate observations. He then joined the Astronomy Department and has since been working with Professor Tremonti.

"The department is very open and welcoming," says John. "People like to talk with each other, exchange ideas, and collaborate. Everyone's interested in what others are doing, and everyone's door is open. It's great to be a grad student in this kind of environment."

In the true spirit of the Wisconsin Idea, John enjoys outreach. For example, he helped to run a summer program at Yerkes Observatory in Williams Bay, Wisconsin, helping middle school students to build handheld telescopes and observe the moon and planets. One of the perks that came with the program: "I lived in an old observing room and got to play with the big telescope." He has also been an active participant in the Universe in the Park program, which introduces people to telescope-views of the night sky in Wisconsin state parks. "I like to open people's eyes to the wonders astronomy has to offer," he adds.

Outside of work, John likes to stay active. "I love hiking and camping in Colorado, where my grandparents live. I've gone there my whole life, and it's one of my favorite places to be in the whole world," he says. Along with UW football, he enjoys getting into statistics with fantasy football, which he says appeals to his weird, sporty, nerdy side.

"I love what I'm doing," says John. "I like having something to think about on a higher level than day-to-day things. With its spatial aspects, sizes, ideas, and concepts, astronomy is a different plane of existence that puts everything else in a different perspective." He would like to do his postdoc abroad.

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

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SKA Pathfinders: A Bright Radio Future

It's an exciting time to be a radio astronomer. The Square Kilometer Array (SKA) and its precursors are opening up a whole new way to do radio astronomy," says Professor Eric Wilcots. The UW Astronomy Department is an integral partner to a number of collaborations preparing the science programs for these pathfinder missions.

The SKA will span over an area of approximately one square kilometer in Africa, Australia, and New Zealand. Image courtesy of SKA/Swinburne Astronomy Productions

SKA. At the center of a new generation of astronomical facilities will be a revolutionary new radio telescope, the SKA. Radio telescopes can study the universe in ways not possible at other wavelengths, because both the emission processes of radio light and the techniques used to observe it are fundamentally different from all other parts of the spectrum. The SKA will answer questions about the link of gravity to other fundamental forces, the origin of dark energy, and the role played by magnetic fields in the formation and evolution of stars, galaxies and galaxy clusters. It will allow astronomers to search for planets, watch stars form, trace the evolution of galaxies, and piece together the structure of the Milky Way Galaxy.

With a collective mirror area of around a square kilometer, the SKA will be the world's premier imaging and survey telescope. Fifty times more sensitive than any other radio telescope, it will survey the sky at least 10,000 times faster than the best current-day telescopes — truly a quantum leap in performance. Part of the SKA is being built in Australia and part in South Africa. The construction of the first elements of the SKA is expected to start in 2016, with the array to be completed by 2024. The first science is expected to commence in 2019.

On the way toward the SKA, South Africa and Australia are building two new pathfinder telescopes — almost like scale models of the full array — to enable early science and iron out the kinks.

MeerKAT. South Africa is currently building MeerKAT ("meer" being the Afrikaans word for "more," and KAT standing for the Karoo Array Telescope, sharing the name with an adorable, small species of mammals native to South Africa). It will be the largest array in the southern hemisphere until the SKA is completed.

ASKAP. The Australian SKA Pathfinder (ASKAP) is a next-generation radio interferometer being built by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) in western Australia. With its large field of view, ASKAP will be an excellent survey telescope, well positioned to make substantial advances in the area of galaxy formation and gas evolution in the Universe, and well suited to study the transient radio sky.

JVLA. While the U.S. National Radio Astronomical Observatory (representing the National Science Foundation) is not an active participant in the SKA consortium, technological advances have made breakthroughs in radio astronomy possible right here at home, too: the 2011 upgrade to the Jansky Very Large Array in New Mexico (named after famous UW alumnus Karl Jansky) has brought this 40-year-old workhorse of radio astronomy into the 21st century, making it up to 8,000 times more efficient, in large part by going from analog to digital technology. In radio astronomy, it really is possible to teach an old dog new tricks.

UW Projects

LADUMA. Professors Eric Wilcots and Matt Bershady are members of the LADUMA (Looking at the Distant Universe with the MeerKAT Array) project, an ultra-deep survey looking for neutral hydrogen in the early Universe. With 5,000 hours of MeerKAT observations, they will study the evolution of hydrogen gas in galaxies over the last 9 billion years. They are particularly interested in the internal motions of galaxies, in small galaxies without much gas, and in clouds of neutral hydrogen that are seemingly not associated with any individual galaxy at all. To complement LADUMA, they are using SALT (Southern African Large Telescope) optical spectra to help in stacking the radio data from hundreds of galaxies to determine the average gas content of faint objects that would otherwise be unobservable. The LADUMA team comprises 67 astronomers from nine countries on five continents. Preliminary observations will begin with the completion of the first seven MeerKAT dishes and fully ramp up when the array is completed.

Continued on next page

Department Welcomes Second Grainger Fellow

This fall, the Department of Astronomy welcomes **Dr. Aleks Diamond-Stanic** as its second Grainger Postdoctoral Fellow.

Aleks is interested in the co-evolution of galaxies and their supermassive black holes, and the role of feedback in regulating star formation.

The Grainger Postdoctoral Fellowship, the Department of Astronomy's first prize fellowship, is generously funded by The Grainger Foundation. "I'm very impressed by the positive working environment in the department and look forward to starting new projects with people here using facilities like SALT and WIYN, and taking advantage of the UW's partnership with MANGA," says Aleks.

Outside of work, Aleks enjoys playing ultimate frisbee and is an avid reader of non-astronomical fiction. He was a Center for Galaxy Evolution Fellow at the University of California-San Diego, and received his PhD in astronomy from the University of Arizona (Tucson) and BA in physics from Carleton College (Northfield, Minnesota).

As a grad student, he worked and co-authored a paper with Hubble Fellow Christy Tremonti, who is now a professor in the department. They have been close collaborators ever since. But his Wisconsin roots go even deeper. Aleks's parents were grad students at UW. His father's name is on an Iron Cross Society plaque at Memorial Union. "My mother was pregnant with me when they moved to Athens, Georgia. I could have been a Wisconsin native," says Aleks.

SKA Pathfinders *continued from page 4*

GASKAP. Professor Snezana Stanimirovic and scientist Bart Wakker are part of the GASKAP (Galactic ASKAP) survey to study the 21-cm neutral hydrogen "spin flip" emission line and the 18-cm lines of hydroxyl in the Galactic plane and Magellanic Clouds. The project is one of the 10 survey science projects selected as top priorities for the first five years of ASKAP operations. Several additional department members (Professors Jay Gallagher, Alex Lazarian, and Ellen Zweibel, and scientist Matt Haffner) plan to join GASKAP science exploration once the data start flowing.

21-SPONGE. Stanimorovic, with graduate student Claire Murray, postdoctoral fellow Robert Lindner, and undergraduate students Nick Pingel and Al Lawrence, are also undertaking a large pathfinder project with the JVLA called 21-SPONGE (21-cm SPectral line Observations of Neutral Gas with the Enhanced JVLA). It is the most sensitive neutral hydrogen absorption line survey in existence and is a pathfinder toward GASKAP.

CHILES. Professors Eric Wilcots and Matt Bershady; former Badgers D.J. Pisano (West Virginia University), Laura Chomiuk (Michigan State University), and Kelley Hess (University of Cape Town); and new grad student Charee Peters are involved in CHILES (COSMOS HI Large Extragalactic Survey). CHILES will use the JVLA to measure hydrogen gas masses, morphology and kinematics for at least 300 galaxies spanning a wide range of masses and environments at significantly larger distances than existing surveys.

Our department has a long-standing research emphasis on the physics of interstellar gas, ranging from forming stars to galaxy clusters. The SKA pathfinders will allow observational studies directly aligned with this expertise that will offer us a unique opportunity for discovery. "A coordinated observational-theoretical-numerical approach will enable us to take full advantage of upcoming observing facilities in the next decade and make a big stride forward in understanding galaxy and star formation and evolution," says Wilcots.

New Faces *continued from page 1*

in astronomy and a PhD in astrophysics from the University of California-Berkeley, and a BA in physics, astronomy, and astrophysics from Harvard University.

Visiting **Assistant Professor Maggie Turnbull** (PhD, University of Arizona; BS, UW-Madison) is teaching Astronomy 104, Exploration of the Solar System, and is helping to develop an undergraduate planetary science certificate. She is a freelance astronomer and astrobiologist at her own nonprofit organization, the Global Science Institute, based in Antigo, Wisconsin, who searches for signs of extraterrestrial life. She is internationally known for her work cataloging potentially habitable planets and even has an asteroid named after her (7863 Turnbull). She was named to *Wired* magazine's "Smart List 2012: 50 People Who Will Change the World." As an undergrad, Maggie worked with Professor Bob Mathieu and research scientist Barbara Whitney.

Carlos Vera-Ciro and **Bob Lindner** are new postdocs. Carlos received his PhD from the University of Groeningen (Netherlands) and MsC and BA in physics from the University of Medellín (Colombia). He primarily works on galactic dynamics, focusing on the effect of radial migration on the overall structure of the stellar disk of systems like the Milky Way. Other interests include dwarf galaxies, stellar streams, and the properties of the dark-matter distribution in the Local Group.

Bob received his PhD in physics and astronomy from Rutgers University (New Brunswick, New Jersey) and BS in math, physics, and astronomy from UW-Madison, where he was a member of Dan McCammon's x-ray astrophysics group. He studies the physical properties of neutral hydrogen clouds, the seeds of star formation, in the Milky Way as a member of the 21-SPONGE project with Professor Stanimirovic. He is also interested in understanding the formation and evolution of massive galaxies and clusters at high redshift using radio and sub-mm observations.

Solar System's in Good Hands with Anne Kinney

Anne Kinney has one of the best jobs in the federal government system: Director of the Solar System.

Kinney's formal title is Director of the Solar System Exploration Division at the National Aeronautics and Space Administration's (NASA) Goddard Space Flight Center in Maryland. Since 2006, she has led a group of 110 scientists that designs, builds, launches, and operates instruments to every planet in the solar system, including one of the main instruments on Mars rover *Curiosity*. "I do every part of the care and feeding of a large group of scientists," she says. "We do a lot of strategic planning, and I keep the group at the cutting edge of their work."

She received the Presidential Rank Award, the federal government's highest honor, in 2012 and the NASA Outstanding Leadership Award in 2011 and 2005.

Kinney, a UW alum, received a BA with honors in astronomy-physics in 1975. She was a graduate student of physics at the University of Copenhagen's Niels Bohr Institute, and received a PhD in astrophysics from New York University in 1984.

She joined the Board of Visitors (BOV) last fall. "I have a longstanding relationship with the UW and have stayed in touch with the Astronomy Department since I graduated. I was pleased to be asked to join its Board of Visitors," she says. "The department has had a big influence on the field. I meet a lot of UW grads out in the world and am always proud of my UW affiliation." She is also nostalgic about the UW because her parents met on Bascom Hill.

This spring, Kinney hosted a group of BOV members at the Goddard Space Flight Center and scheduled special talks and tours. These included a talk by UW grad and instrument scientist Rick White on the UW instrument that flew on the Hubble Space Telescope, and a tour by UW grad Ron Oliversen of the Magnetometry Lab that builds instruments to measure magnetic fields.

Kinney describes a typical day as "run, run, run, run, run." She has monthly, one-on-one meetings with lab chiefs and office heads. "I spend a lot of time listening to people and talking with them — mostly listening — to make sure they know what's going on in the organization and I understand their problems and issues," she says.

She was previously Director of the Universe Division in the Science Mission Directorate at NASA headquarters. There she managed more than 30 science missions, including the Hubble Space Telescope and the Chandra X-ray Observatory.

Kinney was also the instrument scientist on one of the original instruments to fly with the Hubble Space Telescope, the Faint Object Spectrograph.

As an expert in extragalactic astronomy, Kinney has demonstrated that accretion disks in the center of active galaxies lie at random angles relative to their host galaxies; compiled a spectral atlas of galaxies across wavelengths that was used for the Hubble Deep Field observations of distant galaxies; and published papers on quasars, blazars, active and normal galaxies, and signatures of accretion disks in active galaxies, collaborating on some with UW Professors Jay Gallagher, Linda Sparke (emerita) and Matt Bershady, and UW graduate student Chris Conselice (PhD 2001), now a professor of astrophysics at the University of Nottingham (UK).

She credits her father and her travels for her astronomy career. "My father and I spent a lot of time looking up at the stars together, and he told me what the constellations were," she recalls. And while sleeping on a beach in Greece as an undergrad, she looked up at the stars, planets, and manmade satellites in the exquisitely dark skies and started thinking about astronomy. She then returned to the UW to study math, physics, and astronomy.

Growing up in a Frank Lloyd Wright-designed house in Lancaster, Wisconsin, southwest of Madison, consisting "of a double hexagon with two parallelograms attached, where the closets are triangles, and where the obtuse angle in one room is the complement of the acute angle in the adjacent room," as she describes it, may also have sparked Kinney's interest in math and science.

For Garrett Frankson, Astronomy Is a Passion

Undergrad Garrett Frankson sometimes misses out on social engagements because he wants to look at just one thing in the sky with his telescope. Inevitably, he ends up spending an entire evening looking at it.

He recently emailed Washburn Observatory to ask if they'd be willing to open up the observatory to view a rare, naked-eye-visibility nova that he saw on social media one night. Space Place director Jim Lattis responded to his request by opening the observatory and inviting Garrett to check out the nova.

"I've been interested in astronomy my entire life," says Garrett. "I'll never forget seeing Saturn for the first time when my parents got me a telescope when I was seven years old. I bought an astronomy book at my elementary school book fair and probably read it a hundred times. I kept reading and exploring the skies with my telescope, and it evolved into a passion."

Born in Madison, Garrett grew up in nearby Oregon, Wisconsin. Now a junior, he is majoring in astronomy-physics and working on stellar flares with NSF Astronomy and Astrophysics Postdoctoral Fellow Ben Brown (now at the Kavli Institute for Theoretical Physics at the University of California-Santa Barbara) and Professor Ellen Zweibel. Rapid,

Continued on next page

News Notes

Congratulations, Graduates!

Undergraduates: Jonathan Heile; Christopher Hilgenberg (pursuing a PhD in physics at Colorado State University); **Jack Honor; Matthew Huang; Steffi Klawiter; Matthew Kleist; Karissa Metko; Jessie Otradovec** (pursuing a PhD at the University of California-Berkeley); **Nickolas Pingel** (pursuing a PhD at the University of West Virginia); **Michael Ramuta** (at Working Planet Marketing Group, Providence, Rhode Island); and **Maximillian Westphal** (at Ohio State University Medical Center in Columbus).

Awards

Graduate student **Corey Wood** was awarded a NASA Earth and Space Science Fellowship. Competition was keen, with 114 applicants and only nine awards given out.

Departures

NSF Astronomy and Astrophysics Postdoctoral Fellow **Ben Brown** has left for a final postdoctoral year at the Kavli Institute for Theoretical Physics at the University of California-Santa Barbara, followed by a tenure-track appointment as assistant professor at his alma mater, the University of Colorado-Boulder.

The department's first Grainger Postdoctoral Fellow **Alyson Brooks** is now an assistant professor at Rutgers University's Department of Physics and Astronomy in New Brunswick, New Jersey.

Department News

Bob Mathieu was appointed interim director of the Wisconsin Center for Education Research (WCER) at the UW-Madison School of Education. He has led a number of research projects at WCER, including the Center for the Integration of Research, Teaching, and Learning (CIRTL), funded by the National Science Foundation. He was also named a Vilas Distinguished Achievement Professor.

Scientist **Eric Hooper** is serving as interim director of the WIYN Observatory on Kitt Peak in Arizona.

Space Place director **Jim Lattis** was promoted to the rank of full faculty associate.

Postdoc **David Wake** has accepted a faculty position as a research investment fellow in the Department of Physical Sciences at the Open University, based in Milton Keynes, UK. He remains at the department as a part-time scientist.

Graduate students **Ben Tofflemire** and **Katelyn Milliman** attended national, weeklong schools this summer. Graduate student **Doosoo Yoon** attended a weeklong summer school in Heidelberg, Germany.

Erin Middlemas and **Zach Griffith,** Research Experiences for Undergraduates (REU) students from last summer, have joined the UW-Madison Physics Department as graduate students.

Board of Visitors

Andrew Afflerbach (PhD in astronomy, 1996), CEO and director of engineering for CTC Technology and Energy (Kensington, Maryland), has joined the Board of Visitors. He was Professor Ed Churchwell's student in the mid-'90s.

Ken Ciriacks has resigned from the Board of Visitors and will be senior advisor to the board, with deep thanks from the department.

Garrett Frankson *continued from page 6*

time-resolved spectroscopy of the stars YZ CMi (YZ Canis Minoris) and Proxima Centauri, the closest star to our sun, using the South African Large Telescope (SALT) allows them to study how a flare evolves over time.

"I'm impressed beyond words with Garrett's drive, engagement, and excitement," says Brown. "He's done exceptional work." Garrett emailed department postdocs, faculty, and scientists to inquire about summer projects after his freshman year at UW-Platteville. He began working with Brown before starting classes at UW-Madison.

Outside of school, Garrett enjoys playing ultimate frisbee, backpacking, camping, reading, and astronomy. He is an Eagle Scout and a member of the National Society of Leadership and Success, UW's Badger Aviators flying club, and the Air Force ROTC.

Garrett wants to be an astronaut. "How cool to be one of the select people chosen to lead a NASA exploration mission to the moon or Mars!" he says. "I follow a lot of astronauts on Twitter. Their work is so exciting and never monotonous. One day you're a plumber, the next day an astronomer, and the day after that a medical doctor. And you get to do it all in zero gravity."

Garrett Frankson at the Cloud Peak summit in the Big Horn Mountains of Wyoming

"I love it here at the UW. Sometimes I wish I didn't have to take classes and could just work with Ben all the time analyzing data and drawing up plots for our stellar flares project," says Garrett. "I can't thank my family enough. I wouldn't be where I am today without them," he adds.

The Washburn Observer
Volume 3, No. 2 • Fall 2013

DEPARTMENT OF
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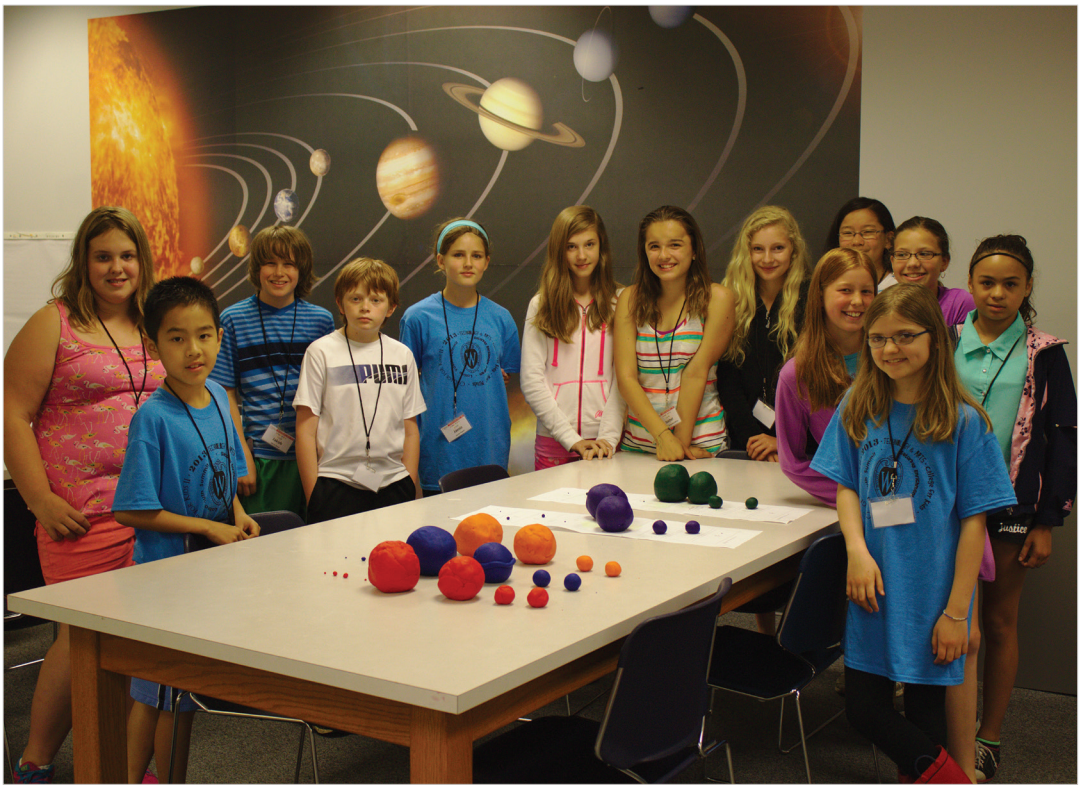
JEFF MILLER, UNIVERSITY COMMUNICATIONS

Autumn leaves cover the ground in front of the Washburn Observatory



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A group of fifth-grade students from the greater Dane County area participated in the College for Kids program at UW Space Place in June. They completed scale models of the solar system using modeling clay. This is a very popular educational activity that provides a vivid insight into the range of masses of the planets that we all already know about. And, by the way, Pluto is included in each of the models on the far right. College for Kids is sponsored by the UW-Madison School of Education.