

CONFLUENCE

THE COLLEGE OF LETTERS AND SCIENCE • MONTANA STATE UNIVERSITY • 2013-2014 • VOLUME 10

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Dear friends and colleagues,

As my first year at MSU draws to a close, I wanted to take this opportunity to thank all of YOU—our wonderful students, faculty, staff, alumni and friends—for welcoming me to the MSU and Bozeman communities. I appreciate the warmth of your welcome and have thoroughly enjoyed exploring this beautiful state I now call home.



Nicol Rae

I continue to be impressed by the exceptionally high quality of teaching, scholarship and creative activity occurring in our college. My decision to apply for the position of the Dean of the College of Letters and Science was heavily influenced by MSU's designation as a "very high research activity" institution by the Carnegie Foundation for the Advancement of Teaching. My interactions with college faculty have illustrated why MSU is in the top two percent of institutions nationwide as measured by metrics of scholarship and discovery. Our faculty are very competitive when measured by accomplishments such as national awards, peer-reviewed publications, invited presentations and journal citations.

This issue of *Confluence* highlights faculty and student researchers who have received prestigious awards and fellowships in recognition of the excellence of their work. You'll learn about award-winning research into the mysteries of the human brain, as well as exciting discoveries testing Einstein's Theory of General Relativity. You'll read about research programs ranging from the transmission of disease from wildlife to livestock to the global risk of asbestos poisoning, from the malleability of human memory to the chemical reactions that occur when spacecraft re-enter Earth's atmosphere—all supported by competitive research fellowships.

The accomplishments of these individuals, along with many others throughout the college, benefit the college, the university and the community in many ways. Their prominence attracts other highly qualified faculty to our college, as well as top students. Their work also brings external research funding, which provides research opportunities for undergraduate and graduate students, contributes to the local economy and enhances the prestige of our academic programs.

As you read this issue of *Confluence*, focused on our faculty and student scholars, and enjoy these highlights of faculty, staff, student and alumni accomplishments, we hope you'll be inspired to learn more about what is happening across the college. You can visit our website at www.montana.edu/lettersandscience for frequently updated news. You can also follow us on Facebook at www.facebook.com/letters.science.

The next time you're in Bozeman, please stop by and say "hello." We'd love to see you and have you meet our faculty and students.

Best regards,

Nicol C. Rae
Dean



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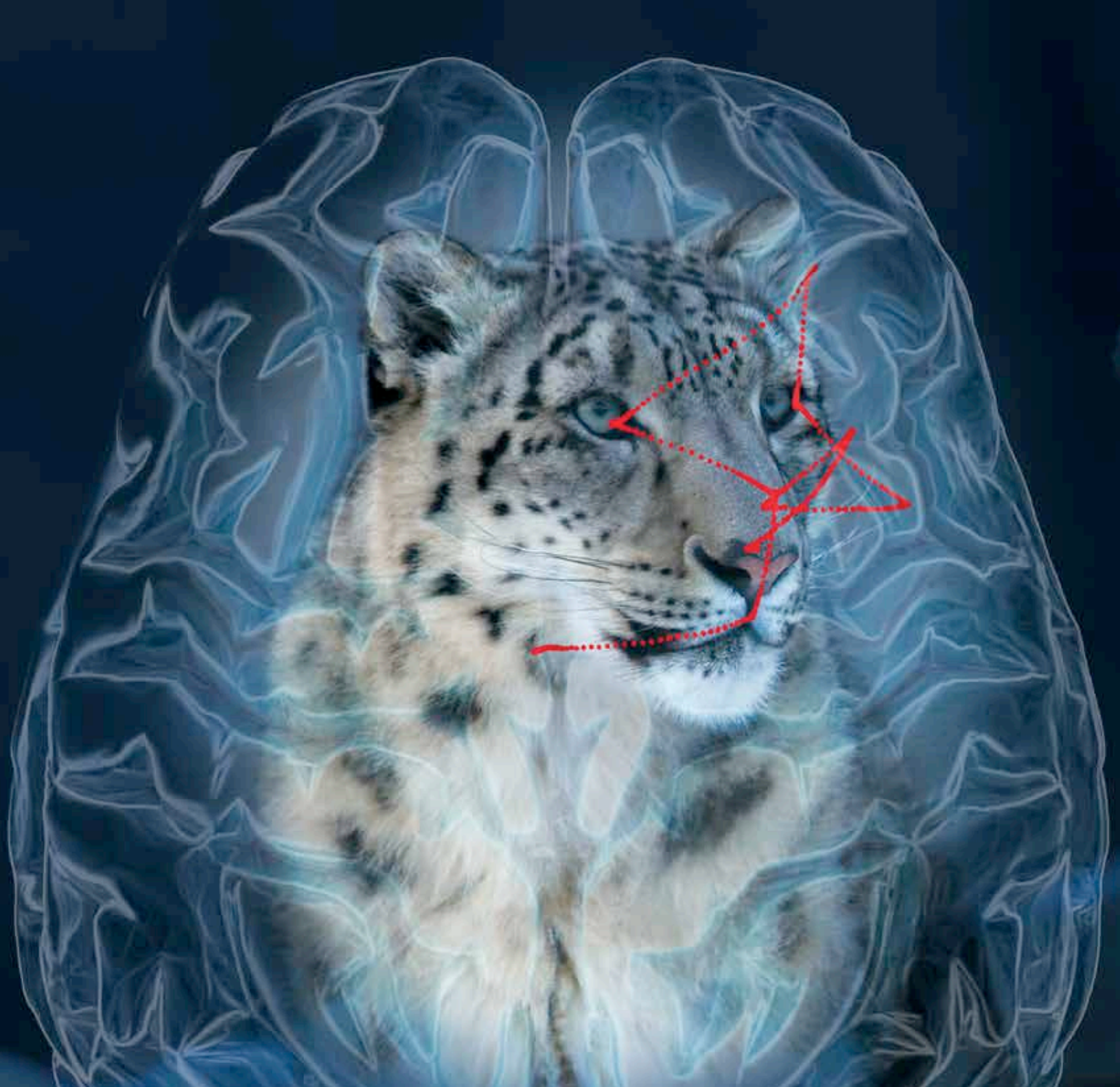
COVER

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THIS PAGE

Kara De León collects samples from a hot pool in Yellowstone National Park.





Above: The image of the snow leopard shows the scan path of a monkey's eye movements (in red) as she inspects the details of the photograph. Humans and other primates show the same behavior and typically move their eyes 3-5 times each second when inspecting visual scenes.

Right: Charles Grey



MSU SCIENTIST RECOGNIZED FOR INNOVATION IN BRAIN RESEARCH

Montana State University researchers who study short-term memory say their findings may someday help people whose brains are not functioning as they should. Charles Gray, professor in the Department of Cell Biology and Neuroscience, is at the forefront in this area of inquiry and his work is receiving national and international attention.

Gray recently learned that he was one of four U.S. scientists to receive a prestigious award that will help fund his research for three more years. The McKnight Endowment Fund for Neuroscience awarded Gray a \$300,000 Memory and Cognitive Disorders Award, which will give him \$100,000 each year from 2013 through 2015. The other awards went to researchers at Stanford University, Columbia University and Carnegie Mellon University.

In addition to his McKnight award, Gray and his research collaborators recently published their latest discoveries in *Science*, a leading journal for original scientific research, global news and commentary. Gray was principal investigator of a five-year research project, funded by the National Institute of Mental Health (NIMH) and the National Institute of Neurological Disorders and Stroke (NINDS), where researchers studied how visual objects were held in short-term memory.

Focusing on two key regions in the cerebral cortex—the pre-frontal and posterior parietal areas that are critically involved in cognition, attention and short-term memory—the scientists discovered that signals in both regions synchronized with one another when objects were held in short-term memory.

“The discovery demonstrates that the two regions closely coordinate their activities in a manner that depends on what is being held in memory,” Gray said.

This process occurs even when the cortical regions are widely separated from each other and their connections are relatively weak, he added. Each region contains billions of nerve cells, but the number of nerves connecting them amounts to a tiny fraction of the population.

“The Holy Grail of neuroscience has been to understand how and where information is encoded in the brain. This study provided more evidence that large-scale electrical oscillations across distant brain regions may carry information for visual memories,” said NIMH Director Thomas R. Insel, M.D.

Gray, referring to the possible communication between the two regions of the brain, said, “We don’t fully understand the communication.”

The new study provides key insights into the details of the process, however.

The cerebral cortex alone has approximately 100 regions for which researchers are beginning to determine their function, Gray said. The regions sometimes act alone and other times cooperate and function together. They are responsible for nearly all cognitive and mental functions, ranging from perception and voluntary movement to attention, reasoning and memory.

“When we pay attention, remember, make decisions or feel certain emotions, our cortex is critically involved,” Gray said.

The cerebral cortex lies over and around most of the structures of the brain. It’s also connected heavily to structures inside the brain, such as the thalamus and Basal Ganglia, which are both necessary for memory, Gray said. The thalamus relays sensory and motor signals and regulates sleep, consciousness and arousal. Both the cortex and thalamus work together with the Basal Ganglia, which are associated with habits, learning and motor control.

As a result of the brain’s complexity, studying it is a long, slow process, Gray continued. But understanding the communication process could help scientists develop strategies for treating people where communication within the brain is believed to be disrupted. Those conditions include Parkinson’s disease, autism, depression and schizophrenia, among others.

Gray, who has worked with neurosurgical teams in California where he helped measure brain activity in patients being treated for Parkinson’s disease, co-authored the paper that was published in *Science*. The work was done together with lead author, assistant research professor Rodrigo Salazar, and graduate student Nick Dotson, both in MSU’s Department of Cell Biology and Neuroscience, and Steve Bressler, a neuroscientist at Florida Atlantic University and long-time collaborator of Gray’s.

Gray is seeking a deeper understanding of the physiology of short-term memory, attention and decision-making. Based on funding from NINDS, his laboratory has developed an instrument that can measure neural activity at a very high resolution from many locations. It provides an advantage over currently available technologies, enabling observation of how large circuits in the brain behave in real time. During the three years of his McKnight Award, Gray plans to measure neural activity from large areas of the brain to obtain a broad perspective on how and where information is encoded when something is held in short-term memory.

Want to know more?

www.montana.edu/lettersandscience/2013/gray

Excerpted from Evelyn Boswell, MSU News Service

MONTANA CONNECTION ZAMBIA

THE



The transmission of diseases such as brucellosis from wildlife to cattle in the ecosystem surrounding Yellowstone National Park—and related issues such as Montana’s controversial bison hunts, the maintenance of Montana’s brucellosis-free status, and the capturing and slaughtering of Yellowstone bison by government agencies—have caused substantial conflict in Montana. Other countries have similar issues and conflicts, and a MSU researcher is investigating how brucellosis, foot-and-mouth disease and bovine tuberculosis affect wildlife in Liuwa Plain National Park in Zambia, Africa.

Angela Brennan, doctoral student in the Department of Ecology and MSU’s lone recipient of a 2012 Fulbright Fellowship, is using her fellowship to travel to Zambia to study the effects of disease on wildlife and livestock, focusing primarily on blue wildebeest, which migrate back and forth across Liuwa.

“Wildebeest are the dominant herbivore on the landscape,” Brennan said. “Like bison once did on the Great Plains of North America, they play a pivotal role in the Liuwa region’s

ecology and that’s why working on their conservation is so important.”

Of concern is whether disease transmission occurs between the wildebeest population, which numbers in the tens of thousands, and domesticated livestock. Brennan said the project’s goal, both from a conservation perspective and for primary research, is to study wildebeest population dynamics and to better understand just how prevalent these diseases are in the system.

“It’s not always about a species or a place, but rather it’s about a question. Once you have that, you can really start digging into the fun stuff. That’s where you start to see certain species and places with a perspective that only comes from spending time in the field armed with a good question.”

— ANGELA BRENNAN, doctoral student, Department of Ecology

Cattle herding is important to the economy of the Lozi people who live in some 400 villages scattered around the region. While transmission of diseases like brucellosis to humans is relatively rare in the developed world, it can be a deadly problem for people in rural Zambia.

Because there is potential for wildebeest and cattle to commingle and for disease to spread back and forth, Brennan will use blood samples, radio collars and telemetry to map overlap in habitat use and to understand infection rates and disease transmission.



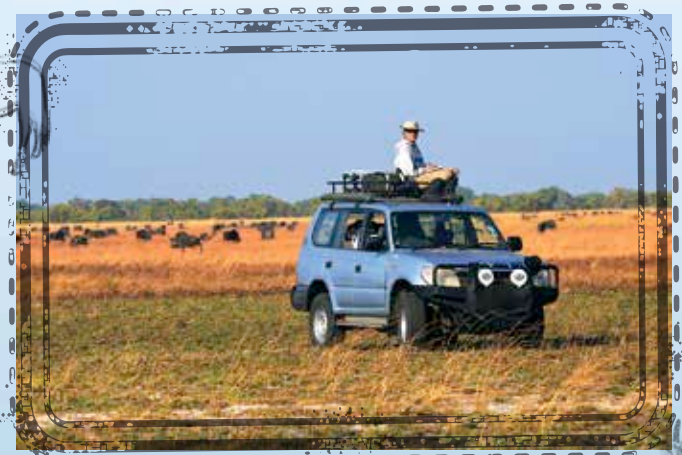
Brennan is in her fourth year of a doctoral project to study how the seasonal congregation of elk herds affects the spread of brucellosis in ten Wyoming elk populations. “I’m in the process of analyzing the data and, of course, writing the dissertation,” Brennan said. Brennan, who hails from Minnesota, holds an undergraduate degree in biology from the University of Wisconsin–La Crosse and a master’s degree in environmental science from Western Washington University.

Brennan will be one of 1,700 American students, scholars, teachers, scientists and artists to travel abroad on Fulbright awards for academic year 2012-2013, with a goal of providing cultural exchange and increased mutual understanding among nations. The program is sponsored by the U.S. Department of State.

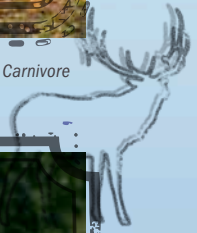
“This Fulbright is a great opportunity for Angela to get a different perspective on things,” said Paul Cross, a disease ecologist with the U.S. Geological Society at the Northern Rocky Mountain Science Center and one of Brennan’s advisers. “Currently, her perspective comes from the work she’s doing on elk populations in the greater Yellowstone ecosystem.”

“Not only is a Fulbright a prestigious award for Angela and for MSU, it gives her experience that will be invaluable as she returns to Montana and looks to the next step of her career,” said Sally O’Neill, Fulbright Program coordinator for MSU’s Office of International Programs. “The connection between her Fulbright and dissertation research will certainly directly benefit Montana in the field of wildlife biology—which is extremely important to our state.”

While the landscapes and cultures are different, Brennan said her research on elk and her work in Zambia share a fundamental approach to wildlife biology.



Angela Brennan observing wildebeast in Zambia. Photo courtesy of the *Zambian Carnivore Programme*.



Angela Brennan

“It’s not always about a species or a place but rather it’s about a question,” Brennan said. “Once you have that you can really start digging into the fun stuff. That’s where you start to see certain species and places with a perspective that only comes from spending time in the field armed with a good question.”

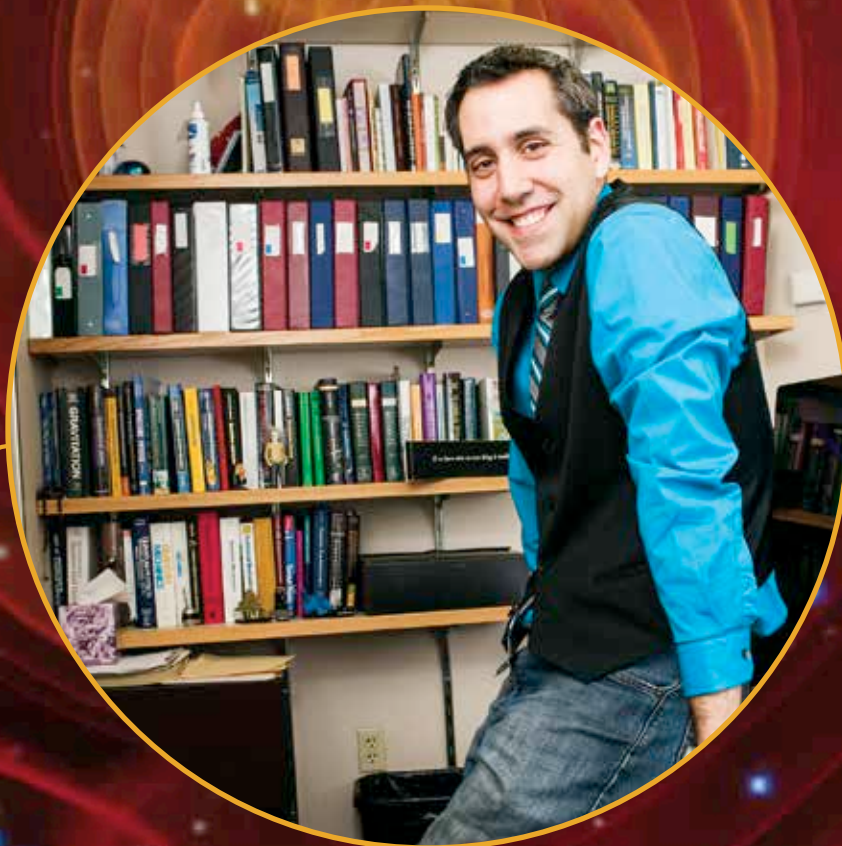
Want to know more?

www.montana.edu/lettersandscience/2013/brennan

Excerpted from Sepp Jannotta, MSU News Service



MSU PHYSICIST SHINES



Portrait: Nicolas Yunes

Background: Simulation of gravitational waves emitted by two black holes merging. *Joan Centrella, Gravitational Astrophysics Laboratory, NASA Goddard Space Flight Center.*

MSU physicist Nicolas Yunes, who researches Einstein's Theory of General Relativity and gravitation, has had a good year. A very good year.

In May, Yunes learned that he had won a five-year, \$500,000 Young Investigator CAREER Award from the National Science Foundation. The CAREER Award is the NSF's most prestigious award that supports the early career development of teacher-scholars and honors outstanding scientists who haven't yet received tenure.

Then, in July, Yunes and postdoctoral scholar Kent Yagi had a paper published in the journal *Science*. This is the first time that Yunes and Yagi have published their work in *Science*, the world's leading journal of scientific research, global news and commentary. The weekly publication is read by an estimated one million readers, and is the academic journal of the American Association for the Advancement of Science.

Richard Smith, professor and former head of the MSU Department of Physics, said, "When one of our faculty wins a CAREER award, we are very pleased because it reflects well on the very high level of research programs at MSU, the top notch caliber of the faculty we are able to attract, and the respect that peer scientists around the country have for the talent and potential they see in new faculty at MSU."

Yunes, a former Einstein Fellow at the Massachusetts Institute of Technology (MIT) and research associate at Princeton University, said he will use part of his CAREER grant to continue researching Einstein's Theory of General Relativity and gravitation. He is working on calculating gravitational wave solutions that could then be used as software filters that are critical for the detection of gravitational waves and to test Einstein's theory.

Gravitational waves are produced by violent astrophysical events, such as when stars explode or two black holes collide, Yunes said. Physicists believe they may be able to detect them for the first time in the history of humankind by the end of this decade. They say this feat will test the accuracy of Einstein's final theory and lead to revolutionary discoveries about regions of the universe that are currently inaccessible with traditional electromagnetic astronomy.

Yunes was instrumental in bringing the "Celebrating Einstein" series of events to MSU in April, and plans to use

the CAREER grant to take the Einstein celebration beyond Bozeman and onto a national stage.

Yunes wants to make Einstein materials available to other universities that plan to hold their own celebrations, and Princeton, MIT, Dartmouth College and the University of Wisconsin-Madison are among those that have already expressed interest, Yunes said. He would like to have "Celebrating Einstein" materials translated into Spanish so schools, especially those across the southern tier of the United States, can hold Einstein celebrations, too.

In addition, Yunes said he will use his grant to work with MSU's Museum of the Rockies and develop a 20- to 30-minute planetarium show that incorporates the "Celebrating Einstein" materials from MSU. The show will be available for free to 1,000 small planetariums across the United States.

"To make a simple analogy, these waves are like the soundtrack to the universe, and their detection will be like transitioning from mute pictures to modern cinema."

- NICOLAS YUNES, assistant professor, Department of Physics

In the paper published in *Science*, Yunes and Yagi conclude that scientists can learn a tremendous amount about neutron stars and quark stars without understanding their internal structure in detail.

The reason is almost universal relations among three intrinsic properties of these highly compressed stars. These relations will allow astrophysicists to learn about the shape and degree of deformation of these stars without knowing the details of their internal structure.

"The stars could be the softest or the hardest in their kind, and it wouldn't matter," Yunes.

These relations, described in Yunes and Yagi's paper titled "I Love Q," are realized among the moment of inertia ("I"), the "Love number" and the quadrupole moment ("Q"). The Love number relates to the deformability of a star when squished. The larger the number, the more deformed the star is. The third quantity, "Q," refers to the changing shape of a star.

Not understanding the internal structure of neutron stars has presented a major challenge to certain astrophysical studies, but the "I Love Q" relations show that you can proceed without that knowledge," Yunes said.

Want to know more?

www.montana.edu/lettersandscience/2013/yunes1 and
www.montana.edu/lettersandscience/2013/yunes2

Excerpted from Evelyn Boswell, MSU News Service



Michelle Meade wins Fulbright to Australia

Sydney Harbour Bridge. iStockphoto.com



Michelle Meade

Michelle Meade, an associate professor of psychology who researches memory, won a Fulbright Fellowship to work with cognition experts in Australia.

Meade, whose work explores the intersection of cognitive and social processes as they relate to human memory, is spending the school year working with the Macquarie Center for Cognitive Science at Macquarie University in Sydney on a Fulbright U.S. Core Award. Meade said her work at Macquarie is focused on older adults and social memory.

Meade said that both she and the group at Macquarie are studying the malleability of memory in older adults; however, they use different tools and techniques.

“The group (at Macquarie) studies social memory. I have been exploring the same questions using different methodology, so I think the collaboration will be exciting,” Meade said.

Meade has been teaching and researching the malleability of memory and false memory since she attended graduate school at Washington University in St. Louis, where she earned both her master’s and doctorate in psychology. A native of Minnesota, she earned her bachelor’s degree at Grinnell College in Iowa. She also researched aging and memory during her postdoctoral fellowship at the Beckman Institute for Advanced Science and Technology.

“Studying how memory breaks down also helps us to understand how memory works,” Meade said. “It’s a great opportunity to spend time with like-minded people studying memory.”

Meade said she had met colleagues from Macquarie at professional conferences and is looking forward to the opportunity to work in depth with them.

“They are a great group doing interdisciplinary research,” Meade said. “I’m excited to bring back some new ideas.”

Since 1986, some 32 MSU faculty members have received Fulbright grants. Among students, MSU has had 21 Fulbrights awarded since 1996.

Excerpted from Carol Schmidt, MSU News Service

Brett Walker



MSU historian wins Guggenheim Fellowship to study asbestos poisoning

MSU historian Brett Walker, who is a world-renowned expert in Japanese environmental history, received a \$48,000 fellowship that will allow him to pursue a global project on asbestos.

Walker was one of 175 scholars, artists and scientists across the nation to win a 2013 John Simon Guggenheim Fellowship. He and D. Graham Burnett of Princeton University were the only fellows in the “History of Science, Technology and Economics” category.

Nicol Rae, dean of MSU’s College of Letters and Science, said, “I’m very proud of Professor Walker. This adds to his long list of scholarly achievements and brings credit to the college and the Department of History and Philosophy. Brett is a stellar faculty member.”

Walker applied for the fellowship by writing a proposal titled, “The Slow Dying: Asbestos and the Unmaking of the Modern World.” Winning the fellowship will allow him to pursue a project that will look at the possibility of global poisoning as industrial infrastructures around the world are destroyed by terrorism, war or natural disasters, or begin to decay, Walker said. The poisoning could relate to the World Trade Towers’ destruction in 2001, the tsunami that struck northeast Japan in 2011 or basically a century of industrial infrastructure that is slowly decaying.

The fellowship will help fund travel to Turkey, South Africa, Russia, Quebec and Japan where he will examine archives, conduct interviews and carry out other fieldwork, Walker said. The project will also involve Libby, Mont., and other locations in the United States.

He will incorporate his findings in the classes he teaches in the Department of History and Philosophy, Walker said. He hopes it might dovetail with projects in the Institute on Ecosystems at MSU. He expects it will lead him to expand his asbestos research to related projects, such as the effects of moving materials containing asbestos across national borders.

In addition to teaching and conducting research, Walker is currently working on a textbook commissioned as part of a series by Cambridge University Press. He hopes to finish the book, titled *A Concise History of Japan*, this summer. Walker was also an editor of a recently published book, *Japan at Nature’s Edge*, which is a collection of essays collected from the 2008 Michael P. Malone Conference exploring the relationship between Japan’s history, culture and physical environment.

Walker served five years as head of the Department of History and Philosophy. The Montana Board of Regents named him a Regents Professor of History in 2008.

Excerpted from Evelyn Boswell, MSU News Service

FOR MSU GRADUATE
STUDENT,
SUCCESS
IS

ROCKET SCIENCE

Portraits: Vanessa Murray. MSU photos by Sepp Jannotta.

Background: Atmospheric gases scatter blue wavelengths of visible light giving the Earth's visible edge a blue halo. Vanessa Murray researches the chemical reactions that occur at the surface of a spacecraft when it re-enters the Earth's atmosphere. Image courtesy of NASA.

Vanessa Murray, a doctoral student in the Department of Chemistry, studies the chemical reactions that occur when rockets return to Earth and her work has drawn the attention of the U.S. Air Force.

Murray was recently awarded a National Defense Science and Engineering Graduate Fellowship from the U.S. Department of Defense, which go to U.S. citizens who intend to pursue a doctoral degree in one of 15 disciplines. The fellowship provides a \$30,000 stipend for each of three years, up to \$1,000 a year for medical insurance and pays her MSU tuition for three years. An MSU faculty member who helped select previous winners said the fellowship is highly competitive, going to only five or six applicants out of 100.

"I think Vanessa's passion for research and her intellectual independence came through in her application," said adviser Tim Minton, a professor in the Department of Chemistry and Biochemistry. "Her unique training in

engineering and science and the fact that her research is of keen interest to the Air Force undoubtedly stood out in the selection process, too."

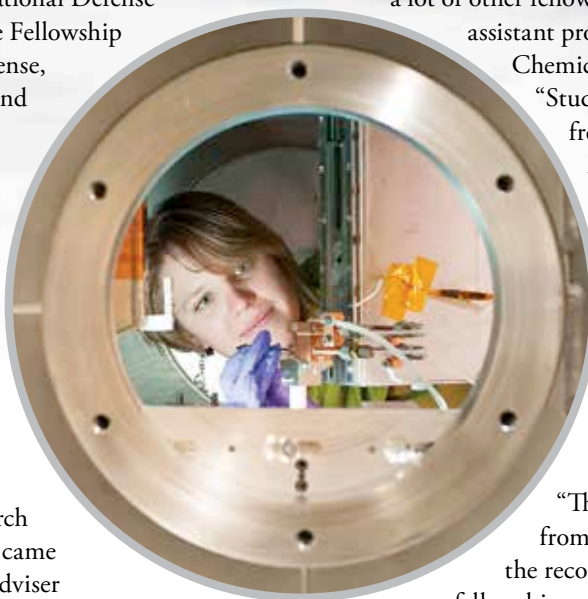
"It's a very competitive panel with a lower success rate than a lot of other fellowships," said Abbie Richards, an assistant professor in the Department of

Chemical and Biological Engineering.

"Students who are applying for this are from the typical big-name schools, like MIT. To have someone from Montana State win one of these really speaks to the quality of students here."

Minton said the fellowship provides full support for Murray's graduate research assistantship, allowing her to stay focused on her chosen area of research.

"The accomplishments that will come from her focused research efforts, and the recognition of this highly competitive fellowship, will create opportunities for Vanessa and position her well for an independent career as a scientist," he added.



MSU statistician receives HONORARY DOCTORATE from Thailand university

John Borkowski, a professor in MSU's Department of Mathematical Sciences, received an honorary doctorate from Thammasat University in Thailand in recognition of everything he has done to build and sustain the doctoral program in statistics at the university. Maha Vajiralongkorn, the country's crown prince, handed the diploma to Borkowski.

"It's just an honor to be considered for such an award, especially since I'm not Thai. It's quite special," Borkowski said.

Members of the royal family traditionally hand out diplomas at a handful of major universities in the country, Borkowski said. He added that Thammasat University primarily gives honorary doctorates to Thais. His was also the first honorary doctorate given to anyone in Thammasat's Department of Mathematics and Statistics.

Borkowski first visited Thailand in 2005 after two MSU graduates from Thailand—Boonorm Chomtee and Kamolchanok Panishkan—recommended that he teach statistics at Thammasat University. Since then, Borkowski has returned several times to teach, mentor students, form collaborations, present research seminars, and give invited and keynote talks at conferences. In 2008, he received a Fulbright Lecture Award to teach in Thailand during the summer and fall.

Excerpted from Evelyn Boswell, MSU News Service



No one has ever tried the kind of experiment before that Murray is conducting, Minton said. It requires her to heat a piece of carbon to more than 3,000 degrees Fahrenheit. By the time it reaches that temperature, the carbon has displayed a range of colors starting with dull red and ending with a white so brilliant that Murray has to wear welding goggles to protect her eyes. Murray then shoots a beam of oxygen atoms at the hot, glowing surface and monitors the products that come off of it.

The goal is to understand the chemical reactions that occur at the surface of a spacecraft when it re-enters the Earth's atmosphere, Minton said.

Murray said carbon-based materials are often used on the leading edges of rockets. While in space, the materials are bombarded with particles that cause the material to erode. When the rocket returns to Earth, the materials have to endure extreme heat. At some point, the materials may fall away, carrying heat away from the rocket.

Murray graduated from MSU in 2011 with a bachelor's degree in chemical engineering, then started a master's degree program in chemical engineering. She later switched to a Ph.D. program in physical chemistry and expects to complete her doctorate in three more years.

Want to know more?

www.montana.edu/lettersandscience/2013/murray

Excerpted from Evelyn Boswell, MSU News Service



John Borkowski



Natasha Pettinger. MSU photo by Sepp Jannotta.

CHEMISTRY AND GERMAN MAJOR WINS GOLDWATER

Natasha Pettinger, a senior majoring in chemistry, biochemistry and German, received a Goldwater Scholarship in 2013. The scholarship is the nation's premier scholarship for undergraduates studying math, natural sciences and engineering. It provides recipients up to \$7,500 a year for tuition, fees, books, and room and board.

Four MSU students, all members of the University Honors Program, were awarded Goldwater Scholarships in 2013. MSU has now received 58 Goldwaters, keeping the university one of the nation's top institutions for numbers of recipients. The other recipients were Alissa Bleem (chemical engineering), Brian Redman (electrical engineering) and Matt Sherick (chemical engineering and bioengineering).

"It's an extraordinary and historic accomplishment for our university and our students," said Ilse-Mari Lee, director of the MSU Honors Program.

A university is only allowed to nominate four students per year, so the fact that all four nominees were selected is a tremendous achievement that recognizes the accomplishments of highly motivated students mentored by inspirational and world-class faculty members, Lee said.

Pettinger lived in Switzerland at age 15 when her father was working there, and the experience gave her a foundation for majoring in German, Pettinger said. She also gained an affinity for research after talking to her adviser, chemistry professor Bern Kohler, as a freshman. She started working in his chemistry laboratory at the end of her freshman year.

Pettinger, who is also a concert pianist, is now studying water oxidation and plans to attend graduate school. After that, she may conduct research and teach at a university.

Excerpted from Sepp Jannotta, MSU News Service

BRYAN VADHEIM BECOMES MSU'S FIRST MARSHALL SCHOLAR

Bryan Vadheim was the recipient of MSU's first Marshall Scholarship, one of the most selective scholarships awarded to American students. Vadheim will receive two years of education in the United Kingdom where he plans to earn a master's degree from the London School of Economics as well as a master's degree in engineering specializing in water science and governance from King's College, also in London.

Vadheim, an MSU Presidential Scholar and a member of MSU's University Honors Program, graduated in May with majors in economics and chemical engineering, as well as minors in statistics, mathematics and business administration. He credits an assortment of mentors at MSU with encouraging the development of his interests.

"One of the things that I have been most appreciative of is how many opportunities I've had while I've been here (at MSU) and how supportive the professors, faculty and staff have been of my efforts," Vadheim said.

The Marshall Scholarship is very similar to the Rhodes Scholarship. However, while Rhodes Scholars must study in the Oxford University system, the Marshall Scholarship may be used at any institution in the U.K. The scholarship was created by the Parliament of the United Kingdom in 1953 in honor of Gen. George C. Marshall as a living gift in recognition of the post-World War II European Recovery Plan, commonly known as the Marshall Plan.

"(Bryan) will serve as a wonderful ambassador for Montana and MSU in the United Kingdom," said Ilse-Mari Lee, director of the University Honors Program. "We are so proud of all Bryan's accomplishments. He possesses the intellect, energy and compassion to make a pronounced difference in this world."

Excerpted from Carol Schmidt, MSU News Service



Bryan Vadheim. MSU photo by Sepp Jannotta.



BROWNING WINS FULBRIGHT TO TEACH ENGLISH IN GERMANY

Elizabeth “Bizz” Browning, a recent MSU graduate with degrees in both English and German studies, received a Fulbright Teaching Assistantship to teach English for the school year at the Albert-Einstein-Schule in the town of Gross-Biebau in Hessen, Germany.

“I think I first started studying German because few people took it and my friend and I thought we could talk together and no one would understand us,” Browning said. “But, I quickly developed a love for the German language and culture.”

“The more I learned about (German history) the more I was inspired,” she said. “It’s such an interesting country.”

Browning also has a passion for English. In fact, she credits English professor Michael Sexson with inspiring her and setting the tone for her scholastically and her adviser Doug Downs, an associate professor of English, with helping set her course for a double major.

Despite the double majors and a semester abroad studying at the Universitat Marburg in Germany as part of an International Undergraduate Scholars Program, Browning graduated from MSU in five years with highest honors and a nearly perfect grade point average. Last year she received the College of Letters and Science’s Dean’s Award for Academic Excellence, an

award presented to the top two seniors in the college. She was also involved in several service projects on campus and in the community, such as working as a SmartyCat tutor at MSU and as a volunteer in-school tutor while she was an exchange student in Germany.

“(Bizz) is so deserving, such a committed educator already,” said German studies professor Patricia Simpson. “She brings international experience, energy and openness to the table. Her students in Germany will benefit, she will gain further experience. It’s a win-win for international education.”

Excerpted from Carol Schmidt, MSU News Service

Elizabeth “Bizz” Browning



Joe Thiel

JOE THIEL WINS RHODES SCHOLARSHIP

Joe Thiel, a May graduate with a double major in liberal studies and chemical engineering, received a Rhodes Scholarship to Oxford University where he plans to pursue master’s degrees in public policy and the economics of development. Thiel, who came to MSU as a Presidential Scholar, was one of 32 Americans selected for Rhodes Scholarships in 2012.

As a freshman, Thiel jumped in and worked as a reporter at the *MSU Exponent*, the student newspaper. Drawing on his high school experience with debate, he also quickly got involved with an Ethicats Ethics Bowl team.

As a junior, he became an Associated Students of MSU senator. While serving with ASMSU, Thiel said he was most interested in seeing that body become more representative of and accessible to the university’s students. To that end, Thiel and his fellow ASMSU members reformed the body so that each college could elect representatives to it.

Then in September of 2011, Governor Brian Schweitzer tapped Thiel to be the student representative to the Montana Board of Regents.

Throughout his MSU career, Thiel was active in the MSU chapter of Engineers Without Borders (EWB), including taking part in two trips to Africa to work on clean water projects for schools in Kenya’s rural Khwisero district. Also with EWB, Thiel worked on writing grants and helped lead a fundraising effort that pulled in \$100,000 for those projects.

“The opportunities I’ve had at MSU are directly related to the world-class people that work here,” Thiel said. “From the countless mentors I’ve had among my professors, to the amazing peer culture among the students, I’ve really benefited from an incredibly intelligent group of friends.”

Excerpted from Sepp Jannotta, MSU News Service



Walter Fleming and Mary Murphy

WALTER FLEMING AND MARY MURPHY RECEIVE GOVERNOR'S HUMANITIES AWARDS

Walter Fleming, professor and head of the Department of Native American Studies, and history professor Mary Murphy, received 2013 Governor's Humanities Awards honoring achievement in humanities scholarship, service and enhancement of public appreciation of the humanities. The awards are given every other year, upon the nomination from Humanities Montana.

Murphy is known for her engaging history books focusing on gender in Montana. She has published 10 books and book chapters, including *Hope in Hard Times: New Deal Photographs of Montana, 1936-1942*, which won the Montana Book Award in 2003. Her *Mining Cultures: Men, Women, and Leisure in Butte, 1914-41*, received the 1998 Barbara Sudler Award from the Colorado Historical Society and was a Choice Outstanding Academic Book in 1997.

Murphy is currently researching the historic role of food in the American West as a way of tracing the history of women in the region. She is also collaborating on a Montana cookbook that will combine essays about food and cooking in Montana with recipes drawn from historical cookbooks.

Fleming, an enrolled member of the Kickapoo Tribe of Kansas, is the author of the bestselling *The Complete Idiot's Guide to Native American History* and co-editor of *Visions of an Enduring People*. He is currently co-writing with Stan Juneau the *History and Foundations of American Indian Education Policy in Montana*, to be published by the Montana Office of Public Instruction.

Fleming has worked as an adviser and consultant on Native perspectives in Montana history, and is working on training Montana teachers in the fields of science, mathematics and engineering in Native-based scientific inquiry.

Excerpted from Carol Schmidt, MSU News Service

MARCY BARGE NAMED A FELLOW OF THE AMERICAN MATHEMATICAL SOCIETY

Marcy Barge, a recently retired professor in the Department of Mathematical Sciences, was included in the first group of fellows ever chosen by the American Mathematical Society (AMS), which celebrates its 125th anniversary in 2013.

"The new AMS Fellow Program recognizes some of the most accomplished mathematicians, AMS members who have contributed to our understanding of deep and important mathematical questions, to applications throughout the scientific world, and to educational excellence," said AMS President Eric M. Friedlander.

The AMS is the world's largest organization dedicated to mathematical research, scholarship and education. Of its 30,000 members, 1,119 were named fellows this year.

"It increases my sense of connection to the broader community of mathematicians," Barge said of his selection.

An MSU faculty member since 1985, Barge explained how he entered the field of mathematics.

"I sort of fell into it because it was the easiest thing for me," he said. "My first job was as an applied mathematician, and I found no joy in it. More or less by accident, I got interested in a problem in topological dynamics, and it was then that my intellectual life really started.

"A year later, I came to MSU to work in this area with my two long-term colleagues Russ Walker and Richard Swanson," Barge continued. "The sort of research that I do in pure mathematics is only supported in research universities."

Excerpted from Evelyn Boswell, MSU News Service



Marcy Barge



Jack Horner

HORNER WINS LIFETIME ACHIEVEMENT AWARD

Jack Horner, Regents Professor of Paleontology and curator of paleontology at MSU’s Museum of the Rockies, has won the Romer-Simpson Medal, the highest honor given by the Society of Vertebrate Paleontology (SVP). This lifetime achievement award recognizes Horner for “sustained and outstanding scholarly excellence and service to the discipline of vertebrate paleontology.”

The organization, which is also honoring filmmaker Steven Spielberg this year, has more than 2,300 members, including professional paleontologists, students, artists, preparators and others interested in vertebrate paleontology.

“I certainly don’t feel as if I’m nearing the end of my work, but I am greatly honored that others think I’ve accomplished enough to deserve such a thing,” said Horner, 67. “I just hope no one expects me to slow down.”

“It is difficult to imagine someone who, rising from such considerable obstacles, has achieved so much, given back so much to the profession, stimulated so much new investigation, and supported so many younger colleagues and students,” Horner’s long-time collaborator Kevin Padian wrote in his nomination letter. Padian is a professor at the University of California, Berkeley.

Horner’s award is named after two scientists who contributed much to the field of vertebrate paleontology. Alfred Sherwood Romer founded the SVP and served as its first president. He was the leading contributor to the discipline of vertebrate paleontology throughout the 20th century. George Gaylord Simpson played a vital role in developing an understanding of the intercontinental migration of extinct mammals and produced a massive classification system for mammals.

Excerpted from Evelyn Boswell, MSU News Service

WELCOME TO NEW COLLEGE FACULTY MEMBERS

This fall, we had a record number of new faculty members join the College of Letters and Science. Welcome!

Agricultural Economics and Economics: Isaac Swenson, Sarah Janzen, Joseph Janzen

Cell Biology and Neuroscience: Susy Kohout, Behrad Noudoost

Chemistry and Biochemistry: Jennifer Dubois

Earth Sciences: Julia Haggerty, Jamie McEvoy, Jean Dixon

Ecology: Jia Hu

English: Kate Ryan, Allison Olsen, Michelle Miley (Writing Center)

History and Philosophy: Maggie Greene, Molly Todd

Mathematical Sciences: Jennifer Green, Laura Hildreth

Modern Languages and Literatures: Galen Brokaw

Native American Studies: Gail Small

Physics: Shannon Willoughby

Political Science: Nicol Rae

Psychology: Rebecca Brooker, Matthew Vess

Sociology and Anthropology: Cody Warner

NEW FACULTY SPOTLIGHT: CODY WARNER



Cody Warner

Assistant professor **Cody Warner**, a native of Meeteetse, Wyo., received his B.A. in psychology and sociology from the University of Wyoming and earned his Ph.D. in sociology from Pennsylvania State University. He currently teaches courses related to crime, deviance and corrections.

Warner’s primary research

focuses on the dynamic relationships between incarceration and social stratification. The United States has the highest incarceration rate in the world, and each year over 600,000 convicted offenders are released from prison and reenter communities across the country. Warner’s main research projects examine ex-inmate life after release, including the types of residences and neighborhoods that individuals find themselves in after leaving prison. He is also engaged in research examining the causes and consequences of crime and victimization during the transition from adolescence to adulthood.



2013 FACULTY AWARDS

L&S Dean's Award for Meritorious Research

Marcy Barge, *Mathematical Sciences*
Susan Cohen, *History and Philosophy*

L&S Outstanding Teaching Awards

Michael Babcock, *Psychology (Tenure Track)*
Shawna Heiser, *Psychology (Non Tenure Track)*
Natalie Scheidler, *History and Philosophy (Graduate Teaching Assistant)*
Olga Vsevolozhskaya, *Mathematical Sciences (Graduate Teaching Assistant)*

L&S Kathy E. Griffith Employee Excellence Award

Sarah Barutha, *Physics*
Cassandra Balent, *History and Philosophy*

Academic Advising Award

Doug Downs, *English*
Steven Holmgren, *Chemistry and Biochemistry*

Cox Faculty Award for Creative Scholarship and Teaching

Jessi Smith, *Psychology*
John Peters, *Chemistry and Biochemistry*

Excellence in Outreach Award

David Lageson, *Earth Sciences*

Phi Kappa Phi Distinguished Teaching Award

William Wyckoff, *Earth Sciences*
Linda Young, *Political Science*

President's Excellence in Teaching Award

Christina Hayes, *Mathematical Sciences*
David Lageson, *Earth Sciences*

Provost's Award for Undergraduate Research/Creativity Mentoring

David Varricchio, *Earth Sciences*

Teaching Innovation Award

Charles McLaughlin, *Chemistry and Biochemistry*

Wiley Award for Meritorious Research and Creativity

Brian Bothner, *Chemistry and Biochemistry*
Susan Cohen, *History and Philosophy*

Retiring Faculty (and the year they joined MSU faculty)

Marcy Barge, *Mathematical Sciences (1985)**
Greg Keeler, *English (1975)**
David Large, *History and Philosophy (1984)**
Barry Pyle, *Microbiology (1985)*
Wayne Stein, *Native American Studies (1989)**

*Conferred with the rank of Professor Emeritus by the Montana Board of Regents.



Laura Burkle

OLD RECORDS, NEW BEES RESULT IN MAJOR PAPER FOR MSU ECOLOGIST

Laura Burkle and her colleagues captured 2,778 bees while retracing the muddy steps of a scientist who studied the interactions between bees and flowering plants more than a century ago.

Occasionally stung, but considering herself lucky to have access to the rich historic records that guided her fieldwork, the MSU ecologist and her collaborators published their results in the prestigious journal, *Science*, earlier this year.

Burkle conducted her bee study in the forests of southern Illinois while she was a postdoctoral researcher at Washington University in St. Louis, Mo. Now at MSU for the past two years, and planning a major ecological study between Yellowstone National Park and Glacier National Park, Burkle and her co-authors compared the bees and flowering plants that existed in 2009 and 2010 with those that existed in the late 1800s and early 1900s around Carlinville, Ill.

The researchers discovered that the area has lost many species of bees and flowering plants over the 120 years since professor Charles Robertson first surveyed the area, Burkle said. Also lost were many interactions between the bees and flowers.

Despite the loss, however, the bees and plants have been surprisingly resilient in the face of warmer temperatures and changing land use, Burkle said. The forests that once grew 10 miles outside of Carlinville are fragments of what they were when Robertson drove his horse and buggy to collect specimens. Fields of corn have replaced acres of trees and prairie. Natural areas have been converted to agricultural, commercial or residential uses. Winter and spring temperatures have risen an average of 3.6 degrees Fahrenheit.

“The good news is that these systems and the way they are structured make them really resilient to change,” Burkle said.



“But there’s been so much change that resiliency has been compromised.”

The scientist who inspired the recent study taught at Blackburn College in Carlinville. He collected most of his data from 1887 to 1897, but continued into 1917.

“He loved it,” Burkle said. “That was his full-time passion.”

Burkle, and Tiffany Knight, her co-author and faculty adviser, spent the springs of 2009 and 2010 doing fieldwork around Carlinville. Generally working in the woods between 9 a.m. and 3 p.m. when bees are most likely to fly, the researchers slogged through the forests looking for the first flowering plants of the season. Then they captured the bees that pollinated those flowers and identified them under the microscopes Burkle set up in their Carlinville apartment.

In 477 hours over two years, the researchers collected 3,620 “floral visitors,” Burkle said. Of those, 2,778 were bees and the rest were mostly flies and butterflies. The plant that attracted the largest number of bees—923 individuals and 33 species—was Spring Beauty, a small herbaceous plant. The second most popular plant was the Great Waterleaf.

In addition to their and Robertson’s specimens, Burkle and Knight compared their findings to those of co-author John Marlin from the University of Illinois. Marlin, who had gathered data from the Carlinville area in the 1970s, provided intermediate-year information that was “incredibly helpful,” Burkle said.

Burkle conducted her research with a \$75,000 RAPID grant from the National Science Foundation.

Burkle’s next study will begin this summer and look at disturbances—such as from recent and more historic fires—to see how plant and pollinator communities re-assemble across Montana between Yellowstone and Glacier national parks.

The suite of species that live in Montana and Illinois are entirely different, but some of the same issues apply, Burkle said.

Want to know more?

www.montana.edu/lettersandscience/2013/burkle

Excerpted from Evelyn Boswell, MSU News Service

Laura Burkle and her collaborators discovered, among other things, that the bee, *Andrena nasonii*, emerged before the majority of spring-blooming plants with which it historically interacted. Photo courtesy of Laura Burkle.





PROFESSOR, GRADUATE STUDENTS RESEARCH WINTER USE OF POPULAR RECREATION AREA



Eric Austin

Hyalite Canyon, which is located in the Gallatin National Forest south of Bozeman, provides diverse, easily accessible, year-round recreational opportunities, including hiking, biking, camping, skiing, snowshoeing, ice fishing and snowmobiling. It's even a great place to cut a Christmas tree! For the past six winters, the road through Hyalite Canyon to Hyalite Reservoir has been plowed

through a partnership between the U.S. Forest Service and Gallatin County, providing winter access to recreationists.

Eric Austin, associate professor in the Department of Political Science, has been working with two Master of Public Administration (MPA) students on a winter use survey for Hyalite Canyon. The MPA students, Bryan Haywood and Lacy Gray, helped develop and implement the survey of winter recreational users to provide the U.S. Forest Service and Gallatin

County administrators with better information as they consider whether and how to maintain plowed access to the reservoir in future winters. The study also included traffic counters scattered throughout Hyalite Canyon.

The study experimented with a mixed-methodology that included both online surveys and in-person interviews. Approximately 500 surveys were collected during a three-month period. The results of the surveys were merged with data gathered from road and trail counters throughout the Hyalite drainage to provide a clearer picture of the range and volume of uses during the winter months. This research afforded the opportunity to collect public lands recreation data that in turn supports deliberation and decision-making among stakeholders, including the U.S. Forest Service and Gallatin County.

“Not only understanding who’s up there but where folks are coming from, if there are folks who are coming from out of town, what else are they doing. Where are they staying? How much are they spending? It helps us get at least an initial idea of the economic impact of winter use activities around Hyalite,” says Austin, who was recently selected as the new executive director of The Burton K. Wheeler Center for Public Policy in Bozeman.



Master of Public Administration students Lacy Gray and Bryan Haywood worked on the Hyalite winter use project. Photo courtesy of Eric Austin.



MSU MICROBIOLOGIST EARNS DOCTORATE STUDYING MICROBES OF YELLOWSTONE AND HANFORD, WASH.

In the hotpots of Yellowstone and the radioactive ground at the Hanford Nuclear Reservation, Kara De León's graduate work at MSU has put her on the front lines of a push to understand and harness the microorganisms known to researchers as biofilm. De León conducted the research for her doctoral dissertation through the lab of Matthew Fields at the Center for Biofilm Engineering.

"I think MSU is set up with the technology and professors to offer grad students a very competitive program, especially in biofilm," De León said. "This experience has given me the hard skills to do genetic sequencing (on microorganisms), as well as to write the (software) script that is essential to being able to manage the amount of data we can collect."

Along with other researchers in Fields' lab, De León traveled to Heart Lake in Yellowstone's backcountry to collect algae samples from the hot springs there. With a focus on some springs that were highly alkaline, the group hoped to promote research on so-called extremophile organisms that hold promise for, among other things, developing biofuels and remediating environmental disasters.

Although the genetic sequencing and data processing was much the same, the work at Hanford addressed a more practical need—the mitigation of chromium contamination by stimulating groundwater and sediment microbes that "feed" on the heavy metal and reduce its ability to travel with the groundwater.

Through the Department of Energy (DOE), and a Lawrence Berkeley National Laboratory-based program called ENIGMA (Ecosystems and Networks Integrated with Genes and Molecular Assemblies), De León and other MSU scientists have been assisting an effort to use the microbes to keep groundwater laden with chromium from migrating into the Columbia River.

De León said her research findings show that the nutrients can help stimulate the chromium-loving microbes, which could have implications for how DOE's expensive mitigation program progresses at Hanford.

Fields said De León had made significant contributions to MSU's work for the ENIGMA program and toward the science of using biofilm for environmental cleanup.

Want to know more?

www.montana.edu/lettersandscience/2013/de_leon

Excerpted from Sepp Jannotta, MSU News Service



Microbiology doctoral student Kara De León, who graduated from MSU in May, prepares a soil sample for transport in the laboratory of Matthew Fields, associate professor and head of the Department of Microbiology.



Researchers collect samples from a hot pool in Yellowstone National Park.



MSU PROGRAM FILLS LANGUAGE GAP IN BOZEMAN SCHOOLS

By Jessianne Wright

Irving Elementary School 2nd grade students showed their enthusiasm when Lauren Hausauer arrived at their classroom. Hausauer, an MSU freshman, spent the 30-minute period teaching the students basic commands in Spanish. Her students learned the Spanish words for “look,” “listen,” “sit,” “stand” and “silence please,” and applied their new vocabulary by playing a game of “Simon Says” in Spanish.

Hausauer is teaching Spanish to elementary school students through a program developed by the MSU Department of Modern Languages and Literatures. This three-credit course, officially titled “Modern Languages 492: Teaching in the Public Schools,” runs from October until May.

Seven MSU students are participating in the program, which reaches out to students from Irving Elementary and Bozeman Summit Montessori schools. It was started several years ago to fill a foreign language gap left by funding cuts in the Bozeman public school system.

Now, without the MSU program, most young students would not be exposed to a different language, explained Irving 2nd grade teacher Jackie Grey.

Grey studied Spanish in high school and college and has been able to teach her class some basic vocabulary. However, this program exposes the students to a more in-depth study of the language.

In addition to teaching students a new language, the program allows the children to better understand English as they learn rules about grammar and mechanics, Grey explained, adding that learning multiple languages enhances memory and speech.

MSU students spend 30 minutes every school week teaching Spanish to their assigned elementary classes. They are given lesson plans, which were created using a grant the department received from MSU’s Teaching and Learning Committee.

Bridget Kevane and Sally Sanchez, both MSU Spanish instructors, prepared the lesson plans and purchased books, music and props for students to use in the classroom. Students have the freedom to creatively build on the provided plans, allowing them to return to past activities or incorporate books and games into each lesson.

“The material is presented in a variety of ways to meet the learning styles of all students,” Grey said.



Irving Elementary School students play a game of “Simon Says” in Spanish. Photo by Juan Martos Díaz.



Lauren Hausauer teaching children at Irving Elementary School under the program "Teaching Spanish in the Public Schools." Photo by Juan Martos Díaz.

Colin McClure, a double major in land rehabilitation and Hispanic studies, is also planning to teach at Irving. He has not started yet, but is looking forward to beginning and hopes to "excite [the students] and encourage them to expand and learn about different cultures."

This program is "one of the best ways to engage [MSU] students," Kevane said. "They experience what it is like to have kindergarten through 5th grade students hungry for language and culture."

Students are assigned a grade level based on their position in the Spanish program. Upper-division students are typically assigned 4th or 5th grade, while 200-level students are assigned to kindergarten through 3rd grade.

Kevane hopes that students realize "the importance of introducing students at an early age to another language and culture," and explained it is easy for young kids to become multilingual and appreciate foreign cultures.

MSU students give the program "tremendous energy, imagination [and] partnership," Kevane said. "It is always inspiring when students rise to the challenge."

Reprinted with permission from the MSU Exponent.

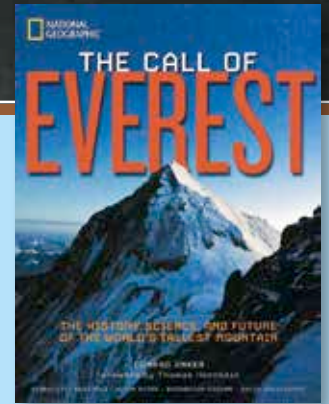
MSU EVEREST EDUCATION EXPEDITION OUTREACH PROGRAM WINS NATIONAL AWARD

The MSU Everest Education Expedition outreach program won a gold award, or first place, in the Council for the Advancement of Support of Education's (CASE) national Circle of Excellence competition. The expedition, which allowed students from Montana's rural communities to follow the riveting adventures of a group of world-class climbers as they climbed Mount Everest, won in the public relations and community relations project category.

Geology professor David Lageson and Travis Corthouts, a graduate student in the Department of Earth Sciences, were heavily involved in the expedition. The climbers and personnel in the team worked with MSU Extended University to help more than a thousand students in Montana to follow the daily challenges and triumphs of the Everest team. An additional 1,200 fans on Facebook also virtually followed the assault on Everest.

"The focus of the outreach was the science of Everest, particularly glaciology, geology, weather, climate change and high-altitude physiology," said MSU Extended University's Suzi Taylor. "Using the intrinsic appeal of Everest, Extended University sought to showcase the university's research strengths and engage students and teachers."

The CASE national Circle of Excellence competition recognizes the best college and university advancement programs worldwide. CASE is an organization made up of universities, colleges and secondary schools throughout the world. The organization said more than 2,000 entries were received in 45 categories of national competition in this year's Circle of Excellence competition.



MSU geology professor Dave Lageson authored a chapter on the "Geology of Mount Everest" for the book *The Call of Everest*, which was recently published by National Geographic.





THE ALUMNI INTERVIEW PROJECT: CONNECTING STUDENTS TO MSU THROUGH STORIES FROM ITS PAST

By Amy Stix

MSU English instructor Jill Davis not only teaches college students how to write well; she also makes it her mission to connect students with their campus community through their own words.

The indefatigable Davis may have launched her most successful project yet, which uses oral history to link current MSU students with those who walked in their shoes decades before.

The Alumni Interview Project grew out of Davis's longtime career in primary research methodology and oral history, which she has used to tell the personal perspectives and insights of Bozeman's homeless individuals and senior citizens. While engaged in those projects, Davis also yearned to interview MSU alumni, former faculty and administrators, to share the university's history and myriad traditions with those newer to campus.

With the help of Jaynee Groseth, president emerita of the MSU Alumni Association, Davis' dream took off, starting with a pilot project that paired six alumni with six freshmen.

This fall, Davis teamed 100 students with 50 alumni to record their memories.

Those stories have included reflections from Stuart (Stu) Knapp, as told through the writing of Heather Demorest, a senior majoring in Community Health.

Knapp, who came to MSU in 1978 from Oregon State University and served for 21 years in positions ranging from parasitology professor in the Department of Veterinary Molecular Biology to vice president for academic affairs, told how a research expedition to Mexico's Sierra Madre changed his life. The experience of riding a horse across hundreds of miles of wilderness inspired Knapp's lifelong love of travel and other cultures. He later founded MSU's International Studies Program and "Great Expeditions" honors course, which has since immersed scores of students in countries across the globe.

As much as the stories of MSU alumni and former faculty awe and inspire their young interviewers, Davis has observed how the act of reflection brings a sense of pride and peace to the storyteller.



Stuart Knapp, a long time professor and administrator at MSU, participated in the Alumni Interview Project.



Jayne Groseth, president emerita of the MSU Alumni Association, helped coordinate the Alumni Interview Project.



MSU English instructor Jill Davis

Today, the stories of Stu Knapp, who died last spring at the age of 84, are forever recorded in Demorest’s detailed and often poignant essay, which was read aloud to Knapp before he passed away.

Davis says the Alumni Interview Project engages students in “really attending to someone’s story,” while breaking down stereotypes between generations of people born as much as a half-century or more apart.

Most important, Davis adds, is that her students “get a sense of place” at MSU and realize, “They are part of a family here.”

MSU GRADUATE WINS SWISS RESEARCH FELLOWSHIP

Kevin Murray, a recent graduate with a degree in biochemistry, won a fellowship to a prestigious research institution in Switzerland where he will study the complicated atomic interactions of an enzyme that has potential use in fuel cells.

Murray, who graduated from MSU last December, won a Seydel Fellowship that will provide him \$20,000 to study for one year at the École Polytechnique Fédérale de Lausanne (EPFL). Murray will work in the Laboratory for Computational and Molecular Design doing further work on a project he started at MSU under Robert K Szilagy, associate professor of chemistry.

The Seydel Fellowship is similar to a Fulbright Fellowship in that it is administered by the Institute of International Education, but is privately funded and is given to scientific researchers, according to Sally O’Neill in the MSU Office of International Programs.

While an undergraduate, Murray had already done some research with another scientist at EPFL, who suggested that Murray apply for a fellowship there. While in Lausanne, which is the French-speaking area of Switzerland, Murray will work on developing an atomic-level computational model of the iron-hydrogenase enzyme, looking at its potential to produce hydrogen gas. The research could have applications in future hydrogen fuel cell technology.

The Butte, Mont. native came to MSU because of the high-level research possibilities it could provide in the research areas that interested him.

“Research opportunities (at MSU) are unparalleled,” Murray said. “It’s been a great place for me.”

Excerpted from Carol Schmidt, MSU News Service



Kevin Murray



ADLER PLANETARIUM NAMES MICHELLE B. LARSON NEW PRESIDENT

In January, Michelle B. Larson became the first female president of the Adler Planetarium in Chicago, Ill., “America’s First Planetarium.”

As president, Larson will oversee a 21st century space science center that includes the institution’s landmark museum complex, exhibition galleries and three theaters; a robust research enterprise; one of the world’s leading collections documenting the history of science; and an award-winning education and outreach program. Annually, more than 470,000 people visit the Adler, making it one of Chicago’s leading tourist attractions.

A native of Anchorage, Alaska, Larson received her undergraduate and graduate degrees in physics from MSU. Her postdoctoral work in high-energy astrophysics was completed at the California Institute of Technology.

Larson previously served as vice provost and professor of physics at Utah State University. She has also served as deputy director of the Center for Gravitational Wave Physics at Pennsylvania State University and as the deputy director of NASA’s Montana Space Grant Consortium, where she coordinated research and education activities with the faculty and students at 24 affiliate campuses and partners.

“I am honored to have been selected to lead the Adler Planetarium,” said Larson. “The Adler is an international leader in astronomy research and public engagement, and I look forward to working with the museum’s talented staff to advance the understanding of space science and engage all visitors in actively exploring our Universe.”



Michelle B. Larson. Photo courtesy of the Adler Planetarium.



Natalie Brown. Photo by Margaret Stratton.

ALUMNUS NATALIE BROWN PUBLISHES DEBUT NOVEL

Author Natalie Brown, who earned master's degrees from MSU in English and Native American studies, published her debut novel, *The Lovebird*, with Doubleday in 2013. *The Lovebird* is an unconventional coming-of-age story that chronicles the

adventures (and misadventures) of Margie Fitzgerald, a sensitive, spirited college student on a quest for love and connection. When Margie finds herself in trouble with the law, she flees her Southern California home for a hideout on the Crow Reservation in Montana. During her journey, she makes discoveries about relationships, the natural world and herself.

Brown, a Southern California native, came to MSU in 2002 for the master's program in English. "I came to Montana because I wanted an adventure," she explains, "and I fell in love with it. I'd had a long-standing desire to learn more about Native American cultures, history and contemporary issues, so I decided to stick around and earn a second master's in Native American



Image courtesy of Doubleday.

Studies. My MSU experience played a significant role in inspiring this novel. I wrote my master's thesis in English on J.D. Salinger, who's work has had a big influence on me, and in the NAS department I was fortunate to be able to learn about tribal traditions of the past and present, particularly those of the Crows. My professors and fellow students, particularly Professor Emeritus Greg Keeler, who recently retired from the Department of English, and Lisa Aldred, formerly of the Department of Native American Studies, were always so encouraging when it came to my writing. I'm really grateful for that."

Brown's novel has earned favorable reviews from *Publisher's Weekly*, *Booklist* and *BookPage*, which hailed her as "a real talent." Both everyday readers and professional reviewers have responded to the book's uniquely vivid, descriptive language, with one Goodreads.com reviewer calling the book "an absolutely wonderful sensory word experience." Brown, a lifelong writer, is hard at work on her next novel, as well as a collection of short stories inspired by Livingston, Mont., where she currently lives. "Trying to make art with words and put it out into the world—that's been my dream for as long as I can remember," she says.

ZACHARY ROGALA APPOINTED AS NEW STUDENT MEMBER OF THE BOARD OF REGENTS

In June, Governor Steve Bullock appointed Zachary Rogala as the new student member of the Montana University System Board of Regents.

Rogala, who is from Darby, Mont., received his undergraduate degree in philosophy from MSU in 2010. While at MSU, he served as a student senator with ASMSU and was president of the MSU Philosophy Society.

Last year, Montana's senior U.S. Senator, Max Baucus, selected Rogala as the 2012 Sean Michael Miles Fellow. While in Washington, D.C., Rogala worked on energy and resource management issues for Senator Baucus.

Rogala has worked as a skiing professional for the last decade in Germany, Chile and Montana, as well as a whitewater wilderness guide in Idaho for seven years. He was a fellow with the Burton K. Wheeler Center for Public Policy in Bozeman, and recently released "The Montana Ethic Project," a 34-part online series featuring presentations from Montana leaders on issues pertinent to the state.

Rogala is currently a first year law student at the University of Montana.



Zachary Rogala. Photo by Adrian Sanchez-Gonzalez, Bozeman Daily Chronicle.

DEPARTMENT HIGHLIGHTS





AGRICULTURAL ECONOMICS AND ECONOMICS



Randy Rucker

Professor Randy Rucker was awarded the Agricultural and Applied Economics Association's prestigious Outstanding American Journal of Agricultural Economics Article Award for his paper "Honey Bee Pollination Markets and the Internalization of Reciprocal Benefits." The paper, which was coauthored by Walter N. Thurman at North Carolina State University and Michael

Burgett at Oregon State University, examined markets for honeybee pollination services in the United States, which are the most extensive and active markets in the world. These markets play important roles in coordinating the behavior of migratory beekeepers, whose managed honeybees both produce honey and provide substitutes for wild pollinators. A large-scale annual migration of beekeepers move hives from farm to farm, charging pollination fees as the crops bloom. In recent years, fees paid to U.S. beekeepers were approximately \$350 million.

In September, the Montana Board of Regents approved a new program in financial engineering for MSU. The program will be the only one in the region, said economics professor Myles Watts, who led the development team. No other programs exist in the Pacific Northwest; the closest undergraduate programs in financial engineering are offered in California. Financial engineering is a growing field with high demand and the potential for high salaries, Watts said. Financial engineers commonly work in banking, corporate finance, securities, insurance, manufacturing, agricultural businesses and other industries that require sophisticated financial management skills. They analyze risk, create strategic business opportunities, look for ways to lower costs, and access new markets by combining new and existing financial economic instruments. The Department of Agricultural Economics and Economics and the Department of Mechanical and Industrial Engineering in the College of Engineering will manage MSU's new program jointly. Students will take courses in either department or a combination of the two.



Myles Watts



Tiphani Lynn

CELL BIOLOGY AND NEUROSCIENCE

Tiphani Lynn, a 2012 MSU graduate in cell biology and neuroscience and an MSU Molecular Biosciences Fellow, received a Graduate Research Fellowship from the National Science Foundation (NSF). The program recognizes and supports outstanding graduate students in NSF-supported science, technology, engineering and mathematics disciplines. Lynn plans to use the three-year, \$132,000 fellowship to fund her doctoral studies on cortical neurophysiology and visual perception with professor Charles Gray, a professor in the Department of Cell Biology and Neuroscience. Lynn says her research experiences at MSU played a key role in her competitiveness for the prestigious fellowship. As an undergraduate, Lynn participated in the Hughes Scholars program, funded by the Howard Hughes Medical Institute, and engaged in interdisciplinary research through the National Institutes of Health-funded Idea Networks for Biomedical Research Excellence program. Eventually, she would like to open her own laboratory and work in academia.



Frances Lefcort

Frances Lefcort, professor and department head in the Department of Cell Biology and Neuroscience, studies the causes of the devastating peripheral neuropathy, Familial Dysautonomia (FD). People with the disease, which results from a mutation in a single gene, *IKBKAP*, typically die by age 40 because of a failure in their autonomic nervous system. Lefcort's lab developed a mouse model for FD that recapitulates many of the hallmarks of the human disease. They also discovered that the disease is marked by massive programmed cell death of the neurons that control both the sensory and autonomic parts of the nervous system. A paper recently published in the *Proceedings of the National Academy of Sciences* uncovered when and where the neurons die and provided the first mechanistic understanding of the pathways that are activated in the nervous system by the absence of the *IKBKAP* gene. Two undergraduate students, Lindsey Wolfe and Julian Thorne, and Ph.D. student Miranda Orr, made important contributions to the study and share authorship.



CHEMISTRY AND BIOCHEMISTRY

In 2012, the Department of Chemistry and Biochemistry surpassed Yale, Princeton and other top U.S. schools in terms of federal support for chemical research and development. The department is now ranked 28th in the nation, up from last year's ranking of 42. When all sources of funding are taken into consideration, MSU is 39th in the nation, up from 64th a year ago. MSU officials said the department would have ranked even higher if the data were adjusted per capita. Those rankings were based on the latest information from the National Science Foundation and published this fall in *Chemical and Engineering News*. Department head and chemistry professor Mary Cloninger said, "This is a remarkable achievement, especially when one compares the size of the faculty in our department with the faculty makeup of other schools in the top 50." MSU had a record \$112.3 million in research expenditures for fiscal year 2012, which ended June 30. The Department of Chemistry and Biochemistry was the year's top research department, with research expenditures totaling \$10.6 million.



John Peters

John Peters, professor of chemistry and biochemistry and director of MSU's Astrobiology and Life in Extreme Environments Program, has been tapped to join a \$12 million international research effort to give farmers the ability to boost productivity while using less fossil fuel-dependent industrial fertilizers, which have undergone dramatic price increases in recent years. Along with four

investigators from other universities in the U.S. and two from British institutions, Peters will work on one of four funded projects searching for ways to promote beneficial relationships between plants and bacteria that will result in reducing the amount of fertilizers used on crops. "We are intent on designing a symbiosis between plant and microorganism in which the plant would provide the carbon source needed to feed the bacteria and the bacteria would turn nitrogen into an available form such as ammonium. It would be a process that doesn't require an energy intensive industrial product," said Peters. The National Science Foundation and the United Kingdom's Biotechnology and Biological Sciences Research Council (BBSRC) made the \$12 million in awards following an 'Ideas Lab' that focused on developing new approaches for dealing with the challenges of nitrogen in the growing global food demand.



Chinstrap penguins on King George Island in Antarctica. Photo courtesy of David McWethy.

EARTH SCIENCES

Last December, eight MSU students traveled to Antarctica to learn more about the ecology, climate and geopolitics of the Antarctic Peninsula. It was the first time MSU undergraduate students have been able to travel to Antarctica through an organized class, said trip leader David McWethy, assistant research professor in the Department of Earth Sciences. Traveling by ship, the students visited two to three study sites per day, observing and assisting scientists working for the Antarctic Site Inventory as they visit colonies of penguins, seals and sea birds. The students didn't handle penguins, but they helped to prepare penguin and seabird eggshells for diet analysis, McWethy said. The students also helped census penguin, seal and seabird colonies, and participated in ongoing projects involving mapping the distribution of lichen species. Onboard the ship, the students recorded their findings, discussed scientific papers that were assigned reading for the course, and interacted with the Antarctic scientists.

Earlier this year, the Department of Earth Sciences and MSU Extended University offered an online non-credit class called "Montana's Oil Boom." The course focused on the geologic setting, technology, and economic, social and environmental issues centered around recent energy exploration and development in the Bakken formation of Montana and North Dakota. The course featured 10 interactive presentations by speakers from the Department of Earth Sciences. The course was geared towards anyone living in, working in or interested in the Bakken, including county commissioners, city government officials and community leaders, school and healthcare administrators, employees of organizations such as the Bureau of Land Management, Bureau of Indian Affairs and other state and federal agencies, as well as citizens who are interested in the economics and natural resource issues surrounding this recent development. Montana teachers could earn Office of Public Instruction renewal units for participating in the course.



ECOLOGY

Robert Garrott, professor in the Department of Ecology and director of MSU's Fish and Wildlife Ecology and Management Program, was a co-editor of a recently released book entitled *Yellowstone's Wildlife in Transition*.

Cindy Goeddel, a biological sciences major in the Department of Ecology and a professional photographer, took and donated all the photos in

the 368-page book. The book describes in layman's terms how management policies have evolved since Yellowstone National Park was created in the 1870s. Basically, intensive management to protect and propagate large-bodied mammals has given way to an approach that focuses on restoring and preserving ecological processes. Besides describing change and scientific discovery in the park, the book also makes recommendations on how to confront challenges in American parks and conservation areas worldwide.



A radio collared grizzly passes through an underpass at Castle Junction below the Trans-Canada Highway in Banff National Park. Photo courtesy of HighwayWilding.org.

Associate professor Steven Kalinowski and doctoral student Mike Sawaya recently published the results of a three-year field study on the effects of the Trans-Canada Highway's wildlife crossing structures on Banff National Park bear populations in the journal *Conservation Biology*. Alberta-based wildlife biologist Tony Clevenger, a senior research scientist at Bozeman's Western Transportation Institute, was a co-author of the study. The 25 wildlife crossings in Banff were installed during the 1990s, to keep motorists and wildlife safe. The paper describes the results of genetic testing on 10,000 hair samples, and offers an encouraging assessment that a highway punctuated with 25 different crossings did not fragment the habitat in a way that prevented bears from seeking food, shelter and dispersal areas on either side of the Trans-Canada Highway. Another paper from the study due this fall will break down what ecologists call "gene flow" between bear populations in the Banff ecosystem. That data should help gauge how well the crossing structures perform in allowing different bears to find mates in an ecosystem bisected by a major highway.

ENGLISH

The Montana Board of Regents selected English professor Michael Sexson as the newest Montana University System Regents Professor. This is the

most prestigious designation to be attained by a professor in the system. Sexson is known as a master teacher and a luminous intellectual presence at MSU who has brought passion, energy and depth to his classroom since he began at the university in 1966. He is recognized for igniting the imaginations and academic passions of thousands of students. A writer of books and scores of articles, Sexson is also known as an innovator and organizer of public humanities. Throughout the decades he has organized intellectual conferences that include Eclipse '79 and Logon '83. With his wife, religious studies professor Lynda Sexson, he has produced the *Corona* journal and, most recently, Corona Productions. Previously named Regents Professors at MSU were Jack Horner, paleontology; Gordon Brittan, philosophy; John Carlsten, physics; Brett Walker, history; and Paul Grieco and Trevor Douglas, chemistry and biochemistry. All seven of MSU's Regents Professors are faculty members in the College of Letters and Science.

With the advent of the new writing option in the Department of English, and the option's internship requirement, the department's internship program is growing rapidly, with students completing major internships in local and regional news media, publishing ventures and area non-profits. For example, Kaylee Walden completed internships with the *Bozeman Daily Chronicle* and with *Skiing/SKI Magazines* in Boulder, Colo. Zach Stenberg interned for a North Dakota newspaper, writing about state-level political battles affecting safety and infrastructure in western North Dakota. Madeleine Sherrier gained experience as a full-time summer intern at the NBC News affiliate in Milwaukee, Wis., working in nearly every aspect of television news production, in front of and behind the camera, on the news desk, and in the editing booth. "The greatest power of internships

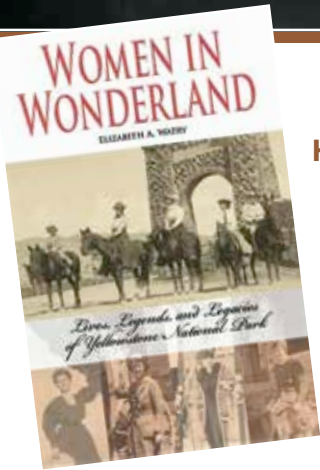


Michael Sexson. MSU photo by Kelly Gorham.

isn't just when students get grounded experience in professional writing and build their writer's portfolios," said assistant professor Doug Downs, coordinator for the writing option. "It's when they can tell you what they know now that they didn't know at the beginning of their internship, and connect that to other learning they've been doing in their major."



Kaylee Walden interned with *Skiing* magazine in Colorado. Image courtesy of Kaylee Walden.



HISTORY AND PHILOSOPHY

Betsy Watry, a graduate of the Department of History and Philosophy's master's degree program, won the 2013 WILLA Literary Award for scholarly nonfiction for her book *Women in Wonderland: Lives, Legends and Legacies of Yellowstone National Park*.

Women Writing the West, a non-profit association of writers in the

West, awards the WILLA. The award is named in honor of Willa Cather, a Pulitzer Prize winner and one of the country's foremost novelists. Awarded annually for outstanding literature featuring women's stories set in the West, the WILLA Literary Awards are chosen by a distinguished panel of professional librarians. The awards are presented at the annual Women Writing the West Fall Conference. Watry and Michael Fox, both assistant curators of history at the Museum of the Rockies in Bozeman, prepared a new exhibit entitled "Welcome to Yellowstone! Tourism in America's First National Park" that opened at the museum in September.

The McNeil Center for Early American Studies at the University of Pennsylvania held a conference to celebrate the career, thus far, of history professor Billy Smith. The conference, which was held November 7-9 in Philadelphia, Pa., honored Smith's contributions to multiple fields, including urban history, the politically engaged study of class



Billy Smith

relations, slavery, demography, print, materialism, quantitative history and maritime history.

Papers and conference discussions reflected on the legacy and future of social history and addressed subjects and approaches in the fields that Smith has pioneered. "It's quite an accomplishment to have a major conference named after oneself," said David Cherry, chair of the Department of History and Philosophy. Smith's new book, *Ship of Death: A Voyage That Changed the Atlantic World*, was published in November by Yale University Press.

MATHEMATICAL SCIENCES

The Department of Mathematical Sciences is restructuring four high-enrollment mathematics and statistics classes in order to increase engagement of students in their learning experience and develop new approaches to classroom management and content delivery. During the spring semester, the department ran a pilot program for two courses, College Algebra and Introduction to Statistics, using TEAL (technologically enhanced active learning) classrooms. In each class, an instructor and an assistant engage students directly through cooperative learning strategies. The pilot programs proved very successful, and the number of students completing the class with an A, B or C for a grade increased by at least 20 percent over the regular classes. During the summer, the department used WeBWork software to redesign Calculus I, incorporating additional online learning tools, lectures and self-testing modules. The support for the redesign of these courses, as well as Calculus II, came from MSU's Strategic Initiative Program. Over 3,800 students take these courses each year, and a successful redesign of these classes will have a big impact on student retention and success at MSU.

In partnership with the Bozeman Public Schools and 16 other school districts across Montana, associate professor Jennifer Luebeck is directing a project to create a model for statewide training of K-12 teachers implementing the Montana Common Core Standards for



Jennifer Luebeck

Mathematics. The three-year project received just over \$1 million in funding from the U.S. Department of Education's Mathematics and Science Partnership initiative, managed through the Montana Office of Public Instruction. In the first year of the STREAM project, training materials for fourth-through seventh-grade teachers were prepared and delivered to an initial cohort of 90 teachers and administrators. They also received blended professional development, including a face-to-face workshop, four months of online training and a weeklong summer academy. Now in year two of the grant, these teachers are enacting strategic plans to provide school-based training to their colleagues with the support of administrators, mentor teachers and STREAM staff. Thirty new teachers in five districts are also completing the blended learning program this year. In year three, the project will work with state agencies to provide STREAM materials and expertise to school districts across the state supporting school-based implementation of the Montana Common Core Standards for Mathematics.



MICROBIOLOGY

Linda Sherwood, a faculty member in the Department of Microbiology, co-authored a newly released edition of the textbook, *Prescott's Microbiology*. This book is used by numerous universities around the U.S. and is also published in several other languages including Korean, Italian, Spanish and French. Sherwood co-authored this popular text with Joanne Willey of Hofstra University and Christopher Woolverton of Kent State University. The new edition features several pedagogical aids that are aligned with Bloom's taxonomy levels. In addition, the content aligns with the curriculum guidelines published by the American Society for Microbiology for general microbiology courses. Also new with this edition are chapter-opening stories that help students relate the activity of microbes to their own lives. Several of these stories include examples from Montana such as microbes in the Berkeley Pit, brucellosis and pine beetle infestations. The rapidly changing field of microbiology requires significant updating of material as new discoveries are made. Therefore, additional content for microbial genetics and molecular biology, microbial diversity, disease processes and immunology have also been incorporated in the new edition.

The Department of Microbiology organized a symposium and ribbon cutting to celebrate the reopening of the renovated Cooley Laboratory. The symposium, which was held last April, featured a keynote talk by Dr. Irving Weissman, director of the Institute of Stem Cell Biology and Regenerative Medicine at Stanford University School of Medicine. Weissman, one of the world's foremost stem cell researchers and a member of the National Academy of Sciences, grew up in Great Falls, Mont., and graduated from what was then Montana State College. The 52-year-old Cooley Laboratory was completely gutted, with renovations paid for largely by \$14.9 million in grant funding from the National Institutes of Health. Reopening in October of 2012, the building's state-of-the-art labs are home to scientists from the departments of microbiology, immunology and infectious diseases, and cell biology and neuroscience.



Cooley Laboratory

MODERN LANGUAGES AND LITERATURES

During the summer semester, the German studies program in the Department of Modern Languages and Literatures offered a short-term faculty-led study abroad program to Berlin, Germany. This first-time program was organized in cooperation with MSU's Office of International Programs. Assistant professor Marc James Mueller, instructor Susanne Pannwitz and eight students spent five weeks studying in the German capital. The students took a semi-intensive language course at the Freie Universität in Berlin, one of the most prestigious universities in Germany. Mueller, a native of West Germany, and Pannwitz, who was born and raised in the former German Democratic Republic, also taught a seminar on Western and Eastern perspectives on German culture and history in the 20th century. The group visited various historic sites in Berlin and the region, and traveled together to Leipzig and Dresden, Germany, as well as Prague, Czech Republic. The students were able to experience one of the most vibrant cities in Europe and learn first-hand how Germany embraces its past and shapes its future. The program will be offered again in the summer of 2015.



MSU students in Berlin, Germany. Photo courtesy of Marc James Mueller.



Jace Meng volunteering in Otavalo, Ecuador. Photo courtesy of Vince Meng, DDS.

Jace Meng, a senior majoring in biomedical sciences with a minor in Hispanic Studies, spent three months in Otavalo, Ecuador volunteering in a medical clinic during the fall. While in Ecuador, Meng also assisted his parents, Sue Meng and Vince Meng, DDS of Missoula, Mont., during a "health care volunteer vacation" in Otavalo. The senior Mengs traveled to Otavalo, October 4 through 13, to provide medical and dental care in remote villages surrounding Otavalo. The health care volunteer vacation was organized through the Tandana Foundation. Tandana is a non-profit organization that offers cross-cultural service-learning, volunteer vacations and support for small community projects in highland Ecuador and Mali in Africa.



Scott Zander. Photo by Mike Greener, Bozeman Daily Chronicle.

NATIVE AMERICAN STUDIES

Scott Zander, an enrolled member of the White Clay People (Ah Ah Ni Nin or Gros Ventre tribe) was hired as the director of the American Indian and Alaska Native student success program, taking over the position held for many years by Jim Burns. Zander mentors and advocates for MSU's Native students, helping them cope with the transition to college and helping them deal with personal and family issues. He also contributes to student retention by helping with financial aid, finding tutors or other help. He serves as the club adviser for the American Indian Council at MSU. The council organizes the annual MSU pow wow, one of the largest pow wows in Montana. Zander, who grew up on Montana's Fort Belknap Indian reservation, also plays an important role in MSU's effort to recruit Native students.

For her master's thesis, Marsha F. Small (Northern Cheyenne) is working to identify and map more than 200 Native American children's burial sites at the Chemawa Cemetery at the Chemawa Indian School in Salem, Ore. The title of her thesis is "Preservation of Sacred Sites and Sacred Places with Geo-Referenced Data, A Voice for the Children of Chemawa Cemetery." Small, whose research is focused on the preservation of sacred sites and sacred places using science and technology, worked as an intern for the Land and Culture Department of the Confederated Tribes of Grand Ronde. Because the graves cannot be disturbed, Small and her colleagues from the Department of Land and Culture are using ground-penetrating radar to search for anomalies below. Small, who has spent \$7,000 in personal funds on the project, is also fundraising to provide continued maintenance at the cemetery, in addition to the funds required to complete her research work at the Chemawa Cemetery.

From left, Melisa Chandler, archaeologist Briecce Edwards, and Marsha Small create a measured drawing of Chemawa Cemetery in Salem, Ore. Photo by Michelle Alaimo, courtesy of Smoke Signals.



POLITICAL SCIENCE

Kelly Green, a Master of Public Administration student, is conducting a study of climate change narratives generated during state legislative hearings. Because climate change initiatives have floundered in Congress, Green is focusing on state-level policy decisions regarding greenhouse gas emission targets to better understand the power of policy narratives in the legislative decision making process. For example, what are the various sources of scientific evidence used to bolster each side of the debate? Who are cast as the winners and losers in the narrative? What entities are portrayed as the heroes, villains and victims of the story? Utilizing the Narrative Policy Framework, a new theory of the policy process developed by her adviser, associate professor Elizabeth Shanahan, Green will work with Shanahan to code the policy narratives to test for differences between the competing narratives within each state debate, as well as variation between narratives sharing the same policy goal across states. Ultimately, the study will develop an understanding of the influence of these climate change narratives on policy decisions.



Kelly Green (front) and Elizabeth Shanahan

Eric Raile, an assistant visiting professor in the Department of Political Science, is an expert in government ethics. He was invited to Croatia, as a special government employee of the United States Office of Government Ethics, to speak at a conference and to members of the government, universities and law schools about the prevention of conflicts of interest in government. Raile drew on his extensive knowledge of the experiences and systems of the United States, particularly in the national executive branch, in preventing conflicts of interest. This issue has been important to Croatia in their preparation to join the European Union. Over the last decade, Raile has contributed to similar activities under the auspices of multilateral organizations such as the Asia-Pacific Economic Cooperation, the Organization for Economic Co-operation and Development, and the Organization of American States.



PHYSICS



Sabrina Savage. Photo courtesy of NASA.

Alumnus Sabrina Savage, a research astrophysicist at NASA's Marshall Space Flight Center in Huntsville, Ala., was named deputy project scientist for Hinode, the joint U.S.-Japanese mission to study the sun. Savage, who joined NASA as a full-time employee in summer 2012, specializes in the sun and solar activity. While helping to lead the Hinode team, she also will continue her research into

solar coronal flows and will participate in missions to develop new solar monitoring instrumentation. A native of Mobile, Ala., Savage earned a bachelor's degree in physics in 2002 from the University of South Alabama in Mobile. She received a master's degree in physics and astronomy in 2004 from the University of Wyoming at Laramie, and earned her doctorate in physics from MSU in 2010.

Solar physicist Richard Canfield received the 2013 Hale Prize from the Solar Physics Division of the American Astronomical Society in recognition of his pioneering research of the sun, outstanding leadership and mentoring. The award, which consists of a cash prize and medal, honors one scientist per year who has made outstanding contributions over an extended period of time to the field of solar astronomy. Canfield's research into solar flares and electromagnetic fields led to new study areas in the field of solar physics. He led a team that discovered how to predict solar storms, giving astronauts and others more time to prepare for the explosive surge of energy that heads toward Earth and threatens satellites, communication systems and power grids. Canfield has also made significant contributions to the field of solar astronomy by training young scientists who now work at such prestigious institutions as Harvard University, NASA and the University of California, Berkeley.



Richard Canfield. Photo courtesy of Deborah Haydon-Canfield.

MSU hosted the 44th annual summer meeting of the Solar Physics Division (SPD) of the American Astronomical Society. Approximately 300 scientists from the United States, India, China and elsewhere attended to discuss every aspect of the sun, from the interior where its energy and magnetic fields are produced, to the outer atmosphere where solar flares and mass ejections occur.

Among other things, participants learned about China's plans for solar observation. They discussed new spacecraft missions,

high-altitude balloon flights, long-term missions and ground-based technology. They received an update on a new U.S. solar telescope to be built on top of an extinct volcano on the Hawaiian island of Maui. The conference also included a free public lecture on how the Sun affects the Earth, and a free workshop for area teachers on how to use NASA materials in the classroom. This was the second time that MSU has hosted the SPD summer meeting. The last time was in 1997.

Courtney Peck, a 2012 MSU graduate in physics, went to Sweden in June to monitor a high-altitude balloon that flew over the North Pole. The balloon—part of a NASA mission called Sunrise II—carried an instrument to collect high-resolution information from the sun. Peck spent four years working with high-altitude balloons when she was an undergraduate involved with the Montana Space Grant Consortium's BOREALIS program. She credited these experiences at MSU for preparing her for this latest opportunity. Peck is now attending graduate school at the University of Colorado, Boulder, with a Graduate Research Fellowship she received from the National Science Foundation. Other institutions involved in the mission are The Max Planck Institute for Solar System Research, the Kiepenheuer-Institut für Sonnenphysik, the High Altitude Observatory in Boulder, Colo., the Lockheed-Martin Solar and Astrophysics Laboratory in Palo Alto, Calif., and the Instituto de Astrofísica de Canarias.



Courtney Peck. Photo courtesy of the Montana Space Grant Consortium.



Maria Guzman, a Billings Skyview High School junior and member of the Crow Tribe, and Jonni Bacon, a Box Elder High School junior and member of the Chippewa-Cree Tribe, were featured in a film produced by the Department of Psychology. Photo courtesy of Taylor Johnson.

PSYCHOLOGY

Associate professor Jessi L. Smith was one of the researchers featured in a short film produced at MSU that explores the opinions of young Native American students about science and their thoughts about pursuing science, technology, engineering and mathematics majors (called STEM fields) in college. In the film, which is available online at MSU's YouTube channel, students describe their personal interest in and views about science. The film overlays the student's perspectives with insights provided by an ongoing research study about Native American students entering college who are pursuing science and engineering majors. The emerging data from the students in the film, the research study and the voices of the students interviewed suggest that the current culture of science may need to be transformed to better recruit and retain these talented students, Smith said. The film is part of a \$212,000 National Science Foundation-funded project called Supportive Communities, which is working to better understand the experience of Native American university students entering STEM majors in college.

A recently published article, coauthored by department head Colleen Moore, found that children who are exposed to lead are nearly three times more likely to be suspended from school by the fourth grade than children who are not exposed, even after controlling for income, race, ethnicity and gender. The paper, which was co-authored by Michael Amato, a doctoral candidate in psychology at the University of Wisconsin-Madison, was published in the September 2013 issue of *Environmental Research*. Nationally, African-American students are three times more likely to be suspended than white students. The same discipline gap was found in the Wisconsin study, but 23 percent of the disparity was explained by differences in rates of lead exposure. Many previous studies have documented disparities in school discipline, but few have specified the underlying factors. "Children exposed to lead don't get a fair start and it affects them for their whole lives," said Moore.

SOCIOLOGY AND ANTHROPOLOGY

During the summer of 2011, the Norton Point fire burned 23,592 acres on the Shoshone National Forest in Wyoming, exposing cultural artifacts and features that were once hidden by vegetation. MSU

anthropology students Meghan Forney and Elizabeth Corey spent two weeks with paid internships working on a project to understand and preserve this unique archaeological landscape. Forney and Corey, along with other project volunteers, conducted in-field analysis of stone tools and lithic debris, identified surface archaeological materials, measured and documented items, and mapped GPS locations. The project was organized by HistoriCorps, a nonprofit aimed at saving and sustaining historic places for public benefit, and managed and supervised by Dr. Larry Todd of the Greybull River Sustainable Landscape Ecology Project. "It was a life-defining opportunity that helped me realize the type of archaeology I want to pursue and gave me professional connections for my future," said Meghan Forney.

Anthropology instructor Nancy Mahoney led eight MSU students through a three-week archaeology field course in Virginia City during the summer. In addition, MSU brought in a group of elementary school teachers involved with the educational outreach program Project

Archaeology. The group unearthed a variety of interesting objects: an ivory handle that came to Montana via the Congo and then France; a ceramic cat; a cufflink with an interior hook that might have concealed a playing card beneath a shirtsleeve; the remnant of an old boot, the likes of which were worn by the bare-knuckle boxers of the day; and an old medicine bottle labeled "St. Jakob's Oel" so as to resemble a health potion concocted by German monks. The group also uncovered well-preserved wooden boards and a post at depths that are below the wall foundations of the neighboring stone building, possibly the remnants of some pioneer structures that were built by miners flocking to the placer gold strike in the very early days of Virginia City.



MSU archaeological interns Meghan Forney and Elizabeth Corey record chipped stone debitage using a GPS device in the burn area. Photo courtesy of Larry C. Todd.



John Olson and Gheri Osborne work at excavating an archaeological site in Virginia City as part of a three-week field course with MSU. MSU Photo by Abbey Nelson.



EITLE NAMED ASSOCIATE DEAN FOR COLLEGE OF LETTERS AND SCIENCE

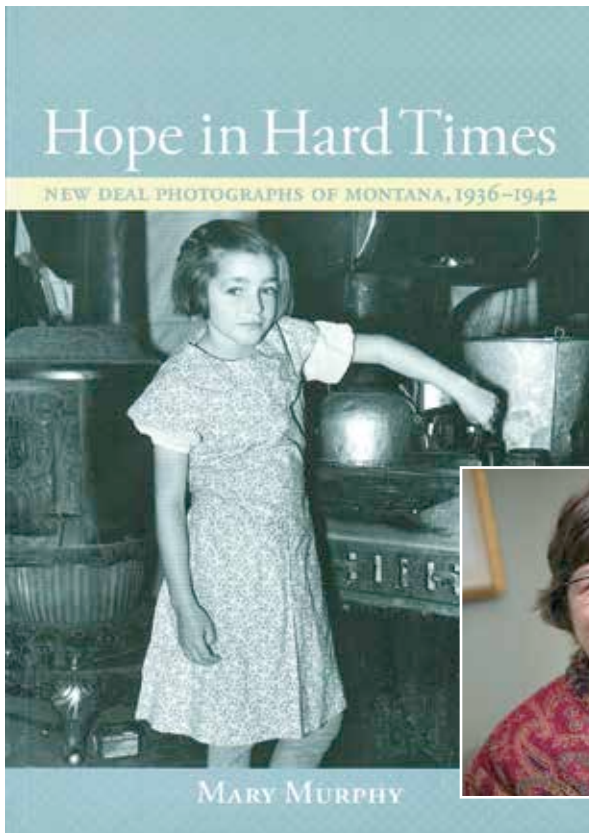


Tami Eitle

Tami McNulty Eitle, an associate professor of sociology in the MSU Department of Sociology and Anthropology, has been selected as the new associate dean for program and curricular development in the MSU College of Letters and Science. Eitle's research focuses on racial and ethnic relations, education, health disparities and deviant behavior (crime and substance use). She has published over 25 peer-reviewed journal papers in the most prestigious journals in her field, including *Social Science Research*, *Social Forces*, *The Sociological Quarterly*, *American Educational Research Journal* and the *Journal of Health and Social Behavior*. She has also contributed expert testimony in federal school desegregation cases, authored or co-authored three book chapters, and has given over 20 invited talks or paper presentations.

Eitle is currently serving as the joint principal investigator on two National Institute of Drug Abuse grants, a rare accomplishment in a field where less than 8 percent of researchers have external funding. A R03 grant, awarded in 2010, is being used to study racial disparities in substance use among adolescents in Montana. It was the first National Institutes of Health grant awarded to a social scientist at MSU. A R01 grant, awarded in 2012, is being used to explore how stress and stressful environments are associated with American Indian substance use, and whether the association between stress and substance use are similar for American Indian and Caucasian adolescents. Eitle replaced Sue Monahan, who is now the dean of the College of Arts and Sciences at Western Oregon University in Monmouth, Ore.

MARY MURPHY NAMED L&S DISTINGUISHED PROFESSOR



Mary Murphy, professor of history in the Department of History and Philosophy, has been appointed as the newest Letters and Science Distinguished Professor, the highest honor the College of Letters and Science bestows upon a faculty member in the college. The appointment was made in recognition of Murphy's contributions to the college, to MSU and to the scholarly community at large, said Dean Nicol Rae. The appointment is for three years.

Murphy first came to Montana in 1980 to research the history of Butte, Mont., for her doctoral thesis from University of North Carolina at Chapel Hill. She's taught at MSU since 1990. In that time, she's won several awards for her teaching and scholarship, including the Wiley Award for Meritorious Research and Creativity, and the Betty Coffey Award for contributions on behalf of women at MSU. She was the



Michael P. Malone Professor of History from 2005 to 2010.

She has served on the Humanities Montana and Montana Historical Society Boards. Humanities Montana named Murphy a Humanities Hero in 2012. In 2013, she was honored with a Governor's Humanities Award (see page 14).

Mary Murphy won the Montana Book Award in 2003 for her book, *Hope in Hard Times: New Deal Photographs of Montana, 1936-1942*, which was published in 2003 by the Montana Historical Society Press.



STEVENS' GIVING SUPPORTS HEALTH SCIENCES AT MSU

Otto O. Stevens, DDS, grew up on the farm in Choteau County, Mont. that his father homesteaded in 1913. His mother homesteaded in 1916. Dr. Stevens graduated from Montana State College (MSC) in 1952 with a Bachelor of Science in zoology and earned his dental degree from Northwestern University Dental School in 1954. He served on active duty in the U.S. Navy Dental Corps for 2 years, and continued in the Ready Reserve until retiring as a Captain, USNR, in 1978.

While at MSC, he spent three years on the advertising staff of the *Exponent* and *Montanan*, served as a homecoming co-chair in 1949 and president of the junior class during the 1949-1950 academic year, and received the Kappa Sigma Distinguished Service Award for Outstanding Junior in 1950.

Dr. Stevens' wife of 61 years, Shirley (Northam) Stevens of Helena, Mont., received a Bachelor of Science in bacteriology in 1951 from MSC. She served as the treasurer of the Alpha Omicron Pi Sorority and secretary of the senior class during 1950-1951 academic year.

Dr. Stevens opened his family dentistry practice in Spokane, Wash. in 1956 and practiced for another 39 years. During his long and distinguished career, he received many awards and honors acknowledging his professional and community

service, including the Distinguished Fellow Award from the International College of Dentistry in 1967 and served as president of the 2,800-member Washington State Dental Association in 1982.

For their 60th class reunion in 2011, Dr. and Mrs. Stevens gave a "thank you" gift of \$100 per year since graduation, or \$6,000, to MSU for health sciences scholarships. Since 2011, the Stevens have continued to make annual gifts to MSU, adding \$100 per year since graduation, or \$6,100 in 2012 and \$6,200 in 2013. They encourage other alumni to consider similar annual giving, smaller amounts in the years following graduation and increasing over time. "Just imagine what a fund would be generated if 3,000 graduating seniors agreed to multiply annual gifts in this simple way," said Dr. Stevens.

In 2013, the Stevens decided to also make a planned gift to MSU. Planned giving is a method of supporting MSU that enables donors to make larger gifts than they could make from their income. While some planned gifts provide a life-long income to the donor, others use estate and tax planning techniques to provide for charity and other heirs in ways that maximize the gift and minimize its impact on the donor's estate. The Stevens' planned gift will support health science scholarships, which will

be available across campus in many departments for students pursuing degrees in health professions.

"MSU offers excellent programs for future health professionals, from medicine to physical therapy to dentistry," said Nicol Rae, dean of the College of Letters and Sciences. "This gift will enhance our recruitment efforts to attract the brightest and best students to MSU."



Otto and Shirley Stevens.
Photo courtesy of Otto O. Stevens, DDS.



THE DEAN'S CIRCLE

The Dean's Circle recognizes alumni and friends whose cumulative lifetime gifts to the College of Letters and Science total \$10,000 or more. We are grateful to this growing group for its loyalty and tremendous support of the college.

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Clockwise from top left: Lauren Hausauer teaching Spanish to students at Irving Elementary School through the "Teaching Spanish in the Public Schools" program. *Photo by Juan Martos Diaz;* Jace Meng and Vince Meng, DDS volunteering in Otavalo, Ecuador. *Photo courtesy of Vince Meng, DDS;* MSU students Meghan Forney and Elizabeth Corey with Dr. Larry C. Todd during an archaeological internship in the Shoshone National Forest, Wyo. *Photo courtesy of Larry C. Todd;* Angela Brennan observing wildebeest in Zambia. *Photo courtesy of the Zambian Carnivore Programme.*