Dear friends and colleagues,

When I first visited the MSU campus in 2012, during my interviews for the position as dean of the College of Letters and Science, I met with faculty in the college and was greatly impressed by the amount of scholarly activity happening within the college focused on the lands and peoples of the North American West. While it is not surprising that we have a high level of research dealing with Montana and adjacent states, we also have faculty working on scholarly projects that examine, and are applicable to, locations and populations all over the Western United States and Canada.

Our college’s location within Bozeman has allowed our researchers to develop expertise on the history, culture, geology and ecology of the Greater Yellowstone region, a critical zone of human and environmental interaction in the past and present. Now, we are seizing the opportunity to build upon this impressive and established base of knowledge, to develop the college into an international hub for scholarship and research as it pertains to the North American West. Through interdisciplinary research, publication, graduate and undergraduate teaching, and community engagement, we want to become a resource for the regional and global community.

This issue of Confluence features some of the finest examples of scholarly activity focused on the North American West in our college. You’ll read about a cultural geography professor and author who studies the people and places in the landscapes of the American West. You’ll learn about two English professors who examine the role of place, identity and belonging in the literature of and about the American West, an ecology professor working to improve the health of Western forests, and a historian who researches the historic role of food in the West as a way of tracing the history of women in the region.

There is an article about a faculty member in the Department of Native American Studies who is working to bring the intersections of native people, economies, land management and tribal policy to the forefront in the field of Western American studies. Finally, we highlight a research program where political scientists attempt to place a value on saving whitebark pine, and another project where ecology researchers found the cause for the decline of pallid sturgeon in the Missouri River.

As you read this issue of Confluence focused on the study of Western lands and peoples, and enjoy 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 and Twitter at www.facebook.com/letters.science and twitter.com/LettersScience.

Best regards,

Nicol C. Rae
Dean

Nicol Rae.
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THIS PAGE
Old Lincoln Highway (Nevada State Route 722) between Carroll Summit and Austin. Photo courtesy of William Wyckoff.

BACK COVER
MSU students head home after a day of installing wildlife-friendly fencing in Montana’s Paradise Valley. Photo courtesy of Stephanie Adams, National Parks Conservation Association.
G
rowing up in the suburbs of Burbank, Calif., sitting in
the backseat of the family sedan on multiple road trips
across the West, William Wyckoff of the Department
of Earth Sciences unknowingly launched into his life’s work. In
his recent book, *How to Read the American West*, Wyckoff recalls
jotting down notes, even at six years old, as the family passed
through towns along the way, in order to keep busy on the road.
This experience and a lifetime of others have set the stage for
Wyckoff’s research on the changing landscape of the American
West, providing him with countless details and examples, which
mark him as an expert in the field.

Wyckoff, a professor of cultural geography, studies the people
and places in the landscapes of the American West. He has
published six books, two textbooks and numerous articles while
also teaching undergraduate and graduate courses in geography.
His years in the field have afforded him important observations
about the West, as well as multiple opportunities to convey
those observations to the community.

**OBSERVATIONS FROM THE ROAD**

Wyckoff dedicated five years of focused study to his recent book,
*How to Read the American West*, a field guide of 100 cultural
features defining the 11 continental Western states. He logged
more than 30,000 miles on the road, visiting every county in
the West, taking about 17,000 photographs along the way. This
kind of in-depth fieldwork has formed Wyckoff’s understanding
of the West.

“It is a convergence of things that makes for a Western
landscape,” he said. He went on to describe features like aridity
and water scarcity, the mosaic of federal land management
and private ownership, vast cultural diversity, as well as rapid
economic growth. “Those things help me, as a geographer,
explain why the West is special.”

The romanticized West draws people from all over the world.
However, he said, “Myths have fossilized how many people see
the West.” He hopes his work can be a kind of antidote to this

*(TRAVELIN’ MAN)*

**MSU GEOGRAPHER HITS THE ROAD TO STUDY THE PEOPLE
AND PLACES OF THE AMERICAN WEST**

*BY JESSIANNE WRIGHT*
stereotyping, as a “fresh regional interpretation of the West,” acknowledging “how internally rich and diverse the West is.”

“There is certainly this set of factors that comes together to make the West a special region, but I think there are many different paths that Westerners take,” Wyckoff added, cautioning against the stereotypical romanticized view of the West as an ancient place of cowboys and Indians or a modern place of barbecues and outdoor living.

**COMING HOME**

“Bozeman has been a great laboratory,” Wyckoff said. “It’s been super to live what I’ve been writing about.”

He tells students, “You’ve got the best laboratory in the West right outside your door…whether you’re looking at vegetation change, or tourism, or agricultural to urban transformation.” Often, he sends his students out to study Bozeman as an example. And the perspectives they share, as well as getting to know his students in general, have bolstered his research.

“Most of my students are from the West,” he said, “but most of them are from parts of the West that I might not know that much about. I’ve learned a lot from students in my classes, through the projects they work on…and from their ideas.”

Wyckoff also likes to bring examples from his own experiences in the field into the classroom. “My work has made me a much better teacher,” he said. He’s able to tell personal stories, which brings life to the discussion.

Ultimately, Wyckoff hopes his research appeals to a younger generation, in order “to make more legible what the ordinary landscape can teach us.”

Doctoral student Nicolas Bergmann took Wyckoff’s course, “Settlement Geography of the West,” last year. “Wyckoff’s enthusiasm and positive energy are infectious,” Bergmann said. “Few people have such a complete command of the geographical and historical processes that have shaped the region.”
“This is a culmination of my teaching and research,” said Susan Kollin of her book, *A History of Western American Literature*, which was published by Cambridge University Press in December 2015.

Originally from Alaska, Kollin is a professor of English and the director of English graduate studies who has taught at MSU for 20 years. Cambridge University Press, the oldest and one of the most revered university presses in the world, sought her out to edit and contribute her own writing to the 430-page scholarly work.

The resulting critical volume explores the people, cultures and landscapes that encompass the American West, a place that today still embodies ideals of promise, escape and wildness. *A History of Western American Literature* examines the complexities of the American West, from its mythical characterization as the “quintessential landscape” that once symbolized opportunity and abundance for a developing nation, to a place that has simultaneously endured bloody conflicts and hardship for diverse ethnic and racial groups, wrought by competing interests and visions for the landscape.

“I have an interest in looking at our ideas of place and belonging,” said Kollin, which she believes “is crucial for understanding our communities and the world.” She devoted two years of research, writing and editing to her book, which not only examines the American West in an historical context, but also its place in the present—and one that is important to global development and community.

“I wanted to place regional literature into a worldly context and to show the local within the global,” said Kollin. Her book, and the critiques of the numerous scholars included within it, shows the American West and today’s “Urban New West” as “the product of and a response to global developments, and as a place that can even offer answers to those problems and concerns that are global,” Kollin said.

Kollin’s study of fiction and non-fiction literature about the American West “through a more analytical lens” is also the foundation of her work in the classroom, where she teaches different interpretations of place, identity and belonging through the perspectives of past and present writers.

Linda Karell, an associate professor of English, also examines identity, place and belonging in her current scholarship.

“Everything we write is in some way inflected by the autobiographical,” said Karell, who is researching and writing a book about women’s memoirs within Western American literature.

Karell said one of the questions that intrigues her is, “How can we separate our personal story from the scholarly?”

For Karell, her current book project is deeply personal. Although the Livingston, Mont. native includes the study of personal memoirs in her courses on American literature and Western American literature at MSU, her own interest in them piqued in 2005, after the death of her mother.

As part of her grieving process, Karell consumed memoirs by women who had lost their mothers. In addition to seeking comfort, the scholar in Karell became intrigued by examining her own interpretation of memoirs through her own personal experiences.

This led to what Karell calls a “hybrid scholarship” project in which she is “trying to use the personal as a type of analysis to critique and understand memoirs.”

Karell’s research considers women’s perspectives of the West through the eyes of women from different ethnic and racial backgrounds, as well as women representative of diverse age groups, locales, sexual identities and socio-economic perspectives.

Understanding women’s memoirs old and new—and looking at her own interpretations of the memoirs through personal experience—breaks molds for the historical identities once prescribed to women in the American West, said Karell. The critiques also reveal the gaps within theories of Western women’s identity.

Melding the personal with the scholarly is “fun and exciting and horribly hard,” Karell laughed.

“My writing and research focus on pushing against those boundaries of identity that make us feel comfortable and safe,” she said. For Karell, as for her colleague Susan Kollin, “celebrating the fluidity of identities” not only helps individuals better understand themselves and their place within the American West, but also the ever fluid and evolving places and spaces that Westerners inhabit and share in common, together.
A
s the West emerges from another summer of record-breaking heat, prolonged drought and catastrophic wildfires, scientists, land managers and the region’s residents are left to contemplate the impacts of climate change yet to come. Jia Hu, an assistant professor in the Department of Ecology and fellow in the Montana Institute on Ecosystems, is leading a team of researchers who are examining the impact climate change, and resulting changes in global air temperature and precipitation patterns, has on both plant and ecosystem-level water and nutrient use.

Concerned about the productivity of mountainous forests across the American West, the U.S. Department of Agriculture’s National Institute of Food and Agriculture (NIFA) recently awarded Hu a four-year grant totaling $466,000. The grant will allow her team to sample streams, snow, soil and plants in the Lubrecht Experimental Forest near Missoula, Mont. over the next three years. During the fourth year, they will analyze their data and submit their findings to NIFA. The goal is to provide baseline information about nitrogen availability and forest productivity. Nitrogen is the most important nutrient in plant growth. Forest managers will be able to use their information to make decisions leading to healthier forests across the West.

“In order to implement sound nitrogen management strategies across Western forests, we need to first understand the nitrogen cycle and then identify the mechanisms responsible for the spatial and temporal patterns of nitrogen availability,” said Hu.

Collaborating with Hu are two faculty members, one specializing in soils and the other in water. Yuriko Yano is a research associate in soil ecosystems and processes at MSU. Kelsey Jencso, who earned his Ph.D. in ecology and environmental science at MSU, is a state climatologist and watershed hydrologist at the University of Montana.

One graduate student and possibly two undergraduates will help with fieldwork, Hu said. Another grad student will take time-lapse photos of the changing snowpack.

Hu said the Lubrecht Experimental Forest is an ideal location for answering their questions because it contains a variety of elevations, slopes, trees and plants in one watershed. The 28,000-acre forest in the Blackfoot River drainage has 23 types of soil, six main types of rock and four major types of timber. Western larch and Douglas fir grow on the north-facing slopes. Ponderosa pine dominates the south-facing slopes and bottomlands. Lodgepole pine grows throughout the eastern part of the forest. Montana is also a good location for the study because it is still relatively pristine compared to the East Coast and other areas, Hu said.

She added that the high-elevation coniferous forests of the western United States are ideal for exploring nitrogen dynamics. Giving three main reasons, she said, “First, while many nitrogen studies have focused on broadleaf deciduous forests of the eastern U.S., fewer studies have examined nitrogen dynamics in Western coniferous forests, where the trees have relatively high nitrogen-use efficiency.”

“Second, Western forests offer a unique opportunity to examine nitrogen dynamics in ecosystems where nitrogen deposition from human activity is still relatively low. Third, given the heterogeneous landscapes of western U.S. forests, it is imperative to establish the relationship between topography, water and nitrogen dynamics so that we can accurately model future species composition and productivity of forests under changing climate and nitrogen deposition scenarios.”

Hu has investigated a variety of ecological questions over the years as a plant ecophysiologist who studies the link between water and carbon on scales that might be as small as a leaf or as large as a forest.

In one project, she helped research the movement of water through the redwood trees that grow in northern California and southern Oregon. The trees that grow more than 300 feet tall transfer millions of gallons of water a day from their roots to their crowns. In another project, Hu spent four months in Tibet where she studied the effects of climate change and land-use policies on grassland productivity.

Before coming to MSU in 2013, Hu spent two years teaching and conducting research at the University of Sydney with support from a $375,000 Australian Research Council Early Career Fellowship. Hu also received a $130,000 postdoctoral fellowship to conduct research at the National Center for Atmospheric Research in Boulder, Colo. from 2010 to 2012.

Excerpted from Evelyn Boswell, MSU News Service
When Gail Small was a young girl growing up on the Northern Cheyenne reservation near Lame Deer, Mont., her father would wake her and her brother early in the morning before the sun rose. Together, they would ride horseback to the Cheyenne high country to watch the magnificent spectacle of the greater sage-grouse mating dance.

The sage-grouse population has declined since then, and their dance is rarely seen by the Cheyenne people today. Small still rides horseback to the backcountry and felt tremendous loss when she could not show her grandson the sage-grouse mating dance. A solemn symbol of the complex web of climate change, industry, indigenous culture and sustainability—the bird’s gradual disappearance may say a lot about Indian people living in today’s American West.

Small, whose Cheyenne name is Head Chief Woman, joined the faculty of the Department of Native American Studies in 2013. She has an impressive background in Indian policy and law, as well as being an internationally recognized advocate and expert on indigenous rights. In 2015, Small received a Leopold Leadership Fellowship from Stanford University’s Woods Institute for the Environment for her research on the “intersections of land and resource management, culture and the environment within the broader context of the sovereign rights of indigenous peoples and contemporary climate change.”

At MSU, Small says she’s committed to bringing the intersections of native people, economies, land management and tribal policy to the forefront in the field of Western American studies through her research and teaching. Her students benefit from her vast knowledge and experience in courses such as “Native American Belief and Philosophy,” “Montana Indian Culture, History and Current Issues” and “American Indian Policy and Law.”

“People of the land view everything as very interrelated,” Small said. “You can’t take one component out, like the sage-grouse, and not look at how one species affects the network of plants, animal, humans and spirituality. We look at the broad picture; we look at life as it really is.”

What’s unique about the connectivity embedded in native life, Small said, is that it has the potential to influence a contemporary understanding of what it means to be a sovereign people in the American West—particularly in places with large native populations, like Montana.

The Northern Cheyenne people are surrounded by coal strip mines. Small grew up seeing her homeland constantly threatened by the consequences of coal strip mining, power plants, compressor stations, railroads and methane wells. Tribal members could be very wealthy if they agreed to mine Cheyenne coal, an issue that she says is always dividing the tribe. “Have we reached an assimilation point where we view our homeland as a commodity and if so, what impact does that have on our cultural beliefs and philosophy?”

Tribal elders came to her office when they started seeing dead beaver and the disappearance of sweetgrass along the Tongue River, both critical staples in Cheyenne cultural ceremonies. They were worried that deer and elk migrations were changing and some of their native foods no longer grew to harvest. Small noted that the economy of the Cheyenne Reservation is subsistence-based, and with high unemployment and poverty, people depend on the land for their food.

According to Small, tribal elders have their own traditional ecological knowledge and they carry the knowledge of generations before them who lived on this land. The elders don’t feel like they have to fit into Western science paradigms, including climate change. “However, these changes directly affect a culture of people and their access to food, religion and indigenous sovereignty,” she added. Head Chief Woman sums up this contradiction by saying that “this is what my research is about.”

In addition to her Leopold Fellowship, Small was honored with Ms. Magazine’s Gloria Steinem Women of Vision Award and received a Jeanette Rankin Award. Montana Magazine recognized her as one of Montana’s most influential leaders in the past 25 years. She received a Rockefeller Foundation Next Generation Fellowship and a Kellogg National Leadership Fellowship. Her work was featured in the 2005 documentary, “Homeland: Four Portraits of Native Action,” which profiled Native American leaders who confront powerful energy companies and government agencies to protect the environment for all Americans.
Women attending Montana State College (MSC) during World War I signed a pledge that they wouldn’t eat more than six pieces of candy a week. When they did eat, the candy would be no larger than one-inch square and half-inch thick.

In the rest of Montana, coffee drinkers cut back on sugar. Children weeded “war gardens.” Women baked bread with rye and barley, so the United States could sell wheat, their premier grain, to Europe. The building superintendent planted potatoes on the University of Montana campus and filled 200 sacks with his 1917 harvest.

According to Mary Murphy, professor of history in the Department of History and Philosophy, all of those food-related war efforts supported the United States and its allies during World War I.

Known for her engaging books on Montana history, 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. Murphy is now 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.

“From the war’s beginning, food was a critical issue,” Murphy said.

The U.S. Food Administration printed the motto “food will win the war” on posters and encouraged Americans to increase food production, preserve food, and reduce their consumption of food. In Montana, MSC and the MSU Extension Service, which was founded the same year the war began, played an integral role in the wartime food effort, Murphy said.

In 1917, the year that the United States entered the war, at least 12 new county Extension agents “spread the gospel of canning throughout Montana,” Murphy said. MSC Dean of Women Una Herrick was behind the candy-eating pledge on campus, and the school encouraged home economics students to use more peanut butter in recipes.

A two-act play written by MSC faculty contrasted women before and during the war. Women in the first act, which took place in 1908, played cards and nibbled on elaborate refreshments. The same women in 1918 worked in a food lab, participated in Red Cross meetings, talked about food conservation and wore “Hoover aprons.” The ubiquitous aprons were named after Herbert Hoover, whose name was synonymous with conservation, Murphy said. Hoover, the 31st president of the United States, was head of the U.S. Food Administration during World War I.

“Dr. Murphy’s research on food, gender and politics in Montana during World War I is important because it shows how a seemingly nonpolitical issue like control over food and food production could serve to engage Montana women’s political consciousness in the period immediately after they obtained suffrage in 1914,” said David Cherry, associate dean in the College of Letters and Science and former chair of the Department of History and Philosophy.

Excerpted from Evelyn Boswell, MSU News Service
Working within a larger study concerning the keystone species whitebark pine, associate professor Liz Shanahan and assistant professor Eric Raile, of the Department of Political Science, conducted a tri-state survey earlier this year in order to understand how the general public values the tree species. Their findings, to be distributed in the spring, will inform policy decisions about the care and treatment of whitebark pine within the Northern Rockies as pine beetles and disease increasingly affect the tree population.

The larger study, funded through the North Central Climate Science Center, includes sophisticated climate modeling of the presence and absence of whitebark pine given particular climate conditions. These model projections are of great interest to entities such as the Greater Yellowstone Coordinating Committee.

“Whitebark pine trees cross jurisdictions,” Shanahan said. “They don’t mind political boundaries we put on the landscape.” She went on to explain how different public lands entities have different management protocols, so the question becomes, “How do you manage a species across political jurisdictions?”

Managers don’t necessarily have a good understanding of how the general public feels about these trees,” Raile added.

To get answers, Andrew Hansen, a professor in the MSU Department of Ecology and the principal investigator for the study, asked Shanahan and Raile to conduct the project’s social science aspect. In conjunction with associate professor Helen Naughton of the University of Montana, the political scientists put together a series of survey questions that focused on attitudes about different management philosophies, willingness to pay for whitebark pine management, and beliefs about the presence of and reasons for climate change. These questions were distributed to residents of Montana, Idaho and Wyoming.

While the study concerns whitebark pine, Shanahan explained that their analysis of an ecosystem’s intrinsic value is an important part of project. “To what extent do people value what they don’t interact with?” Shanahan asked. The survey results will help answer this question, reflecting values placed upon a tree by the general population, which may include people who have never seen the species.

This information is important, Raile added, as climate change becomes more evident and the country is posed with decisions about which species to try to preserve and restore.
Palid sturgeon come from a genetic line that has lived on this planet for tens of millions of years, yet it has been decades since biologists have documented any of the enormous fish successfully producing young that survive to adulthood in the upper Missouri River basin.

Earlier this year, fisheries scientists in the MSU Department of Ecology and colleagues at the U.S. Geological Survey (USGS) and the U.S. Fish and Wildlife Service, published a paper in the journal *Fisheries* describing how oxygen-depleted dead zones between dams in the upper Missouri River are directly linked with the failure of endangered palid sturgeon hatched embryos to survive to adulthood.

“We certainly think this is a significant finding in the story of why palid sturgeon are failing to recruit in the upper Missouri River,” said Christopher Guy, the assistant unit leader with the USGS Montana Cooperative Fishery Research Unit and MSU research professor who was the lead author on the paper.

“We’re basically talking about a living dinosaur that takes 20 years to reach sexual maturity and can live as long as the average American. After millions of years of success, the palid sturgeon population stumbled and now we know why. From a conservation perspective, this is a major breakthrough.”

The study is the first to make a direct link among dam-induced changes in riverine sediment transport, the subsequent effects of those changes on reduced oxygen levels and the survival of an endangered species, the palid sturgeon.

“This research shows that the transition zone between the freely flowing river and reservoirs is an ecological sink—a dead zone—for palid sturgeon,” Guy said. “Essentially, hatched sturgeon embryos die in the oxygen-depleted sediments in the transition zones.”

Guy said fisheries biologists long suspected that the Missouri River’s massive reservoirs were preventing hatched embryonic palid sturgeon from surviving to the juvenile stage. But early attempts to tie the problem to low levels of dissolved oxygen were unsuccessful.

“The reason for that is we hadn’t sampled deep enough,” Guy said. “It wasn’t until we sampled water down at the bottom, where those sediments are being deposited, that we found there was no dissolved oxygen. Because hatched palid sturgeon embryos are negatively buoyant, they tend to sink into that hostile environment.”

The paper details the factors at work in the oxygen depleted transition zones. Eric Scholl, a doctoral student at MSU and
Hilary Treanor, an MSU research associate working with Guy, said they were able to show just how hostile these transition zones between riverine environment and reservoir could be to hatched sturgeon embryos.

In experiments at the U.S. Fish and Wildlife Fish Technology Center in Bozeman with co-authors Molly Webb, Kevin Kappenman and Jason Ilgen, Treanor said different aged hatched embryos were treated with water of varying levels of dissolved oxygen. The lowest level they could recreate—1.5 milligrams of oxygen per liter of water—was still higher than samples pulled from the bottom of the upstream end of Fort Peck Reservoir.

At those depleted levels, the hatched embryos suffered almost immediately.

“We saw changes in their behavior fairly quickly. They became disoriented and weren’t able to move the way they should have,” Treanor said. “Within an hour we started to see mortality. By the end of the experiment they were all dead.”

Pallid sturgeon, native to the Missouri and Mississippi rivers, were listed as an endangered species in 1990. The species can have a lifespan of more than a century.

According to the U.S. Fish and Wildlife Service, fewer than 175 wild-spawned pallid sturgeon—all adults— live in the free-flowing Missouri River above Lake Sakakawea. Since 1990, not a single wild-spawned pallid sturgeon is known to have survived to a juvenile, despite intensive searching.

Given what the new research shows about how no oxygen is available to hatched pallid sturgeon embryos, the authors of the paper propose that officials will need to consider innovative approaches to managing Missouri River reservoirs for pallid sturgeon conservation to have a chance. It also could provide some guiding principles for the construction of new dams around the world, Guy said.

Excerpted from Sepp Jannotta, MSU News Service

“We’re basically talking about a living dinosaur that takes 20 years to reach sexual maturity and can live as long as the average American.”

– CHRISTOPHER GUY

**MSU-LED RESEARCH FINDS CAUSE FOR DECLINE OF MISSOURI RIVER PALLID STURGEON**

**LEFT:** A Montana State University-led study has determined that oxygen depletion where the Missouri River enters Fort Peck Reservoir, pictured, has created a dead zone that kills off hatched pallid sturgeon embryos. The pallid sturgeon has been listed as a federally recognized endangered species since 1990. Photo courtesy of USGS. **RIGHT:** Young pallid sturgeon. Photo courtesy of Christopher Guy/USGS.
THREE L&S STUDENTS RECEIVE PRESTIGIOUS GOLDWATER SCHOLARSHIPS

In 2015, three students majoring in the College of Letters and Science received the prestigious Goldwater Scholarship, the nation's premier scholarship for undergraduates studying math, natural sciences and engineering.

Brigit Noon, a junior from Fairbanks, Alaska, is majoring in biochemistry and plans to pursue a medical degree as well as a Ph.D. so she can conduct research. Riley Shearer, a junior from Lake Oswego, Ore., is majoring in chemical engineering, biochemistry and economics. He plans to pursue a career in research at a major university. Anna Scott, a sophomore from Los Alamos, N.M., is majoring in chemistry and hopes to pursue a Ph.D. in biomedical engineering or economics.

All three recipients, who are also MSU Honors College students, will receive up to $7,500 a year for tuition, fees, books, and room and board.

“Anna, Brigit and Riley are extraordinary scholars who are most deserving of this prestigious award,” said Ilse-Mari Lee, dean of the MSU Honors College.

MSU has now produced 64 Goldwater scholars, keeping the university one of the nation’s top institutions for number of recipients. Of MSU's Goldwaters, 43 (67 percent) have gone to students majoring in the College of Letters and Science.

Excerpted from MSU News Service

ECONOMICS MAJOR AND ACTIVIST RECEIVES TWO PRESTIGIOUS AWARDS

Alexander Paterson, an economics major from Salt Lake City, Utah and a local activist for lesbian, gay, bisexual, transgender and queer-identifying people, was the recipient of a 2015 Truman Scholarship, a highly competitive and prestigious scholarship given to college juniors with demonstrated leadership potential and commitment to public service. The scholarship, which is a living memorial to the late U.S. President Harry S. Truman, provides $30,000 towards graduate school and the opportunity to participate in professional development programming to help prepare them for careers in public service leadership.

In 2014, Paterson also received a Newman Civic Fellows Award, which goes to student leaders who have demonstrated their commitment to finding solutions for challenges facing communities across the country.

Paterson has served as president and mentor to MSU’s Queer-Straight Alliance. In 2014, he successfully lobbied the student government to throw its voice behind a City of Bozeman ordinance protecting people from discrimination based on sexual orientation and gender identity. He led fellow students on a door-knocking campaign to rally support for the ordinance, helping to collect 5,000 signatures from Bozeman residents.

Ariel Donohue, program manager for MSU’s Diversity Awareness Office, said Paterson truly exemplifies the dedication to social change that these awards champion. “He has always been willing to stand up for social justice issues,” Donohue said. “His actions really speak to what he stands for.”

Paterson plans to use his Truman Scholarship to earn a master’s degree as well as an LGBTQ health certificate at the Trachtenberg School of Public Policy and Public Administration at George Washington University in Washington, D.C. His future plans include opportunities to write policy to end discrimination for the LGBTQ community.

Excerpted from MSU News Service
MSU’S THURINGER WINS TRIFECTA OF MAJOR SCHOLARSHIP AWARDS

Cara Thuringer, a double-major in liberal studies (environmental studies concentration) and photography from Sioux Falls, S.D., won three major scholarships in one year.

In April 2014, she received an Udall Scholarship in the environmental category. The award provided her with a $5,000 scholarship, and the opportunity to gather and discuss issues with the other 2014 Udall Scholars in Tucson, Ariz. Then, in spring 2015, she received a Truman Scholarship, a highly competitive and prestigious scholarship given to college juniors with demonstrated leadership potential and commitment to public service.

Last spring, Thuringer was also awarded a Boren Scholarship, a federal initiative designed to build a broader and more qualified pool of U.S. citizens with foreign language and international skills. She will use the $20,000 scholarship to spend her senior year at the University of Ghana, completing a research project on the effect of water scarcity on the emergence of violent conflict.

“To be recognized by three national foundations as an exceptional student and leader is a testament to Cara’s dedication to a career in public service focused on protecting the environment,” said Ilse-Mari Lee, dean of the MSU Honors College.

Thuringer will graduate this year and then spend the summer in Washington, D.C. as part of the Truman Scholarship. Thuringer plans to defer her graduate study in a joint program on the environment and sustainable development at Harvard and Brandeis Universities for a few years while she continues to work on climate change issues.

Thuringer said she believes that her trifecta of major scholarships may not have happened had she not enrolled at MSU.

POLITICAL SCIENCE MAJOR REPRESENTS MSU STUDENTS IN STATE CAPITOL

Garrett Lankford, a junior from Great Falls, Mont., majoring in political science, served as the Associated Students of MSU (ASMSU) student lobbyist during the 2015 Montana legislative session. Lankford lived full time in Helena, the state capitol, during the four-month legislative session, which ran from January 5 to April 28.

Lankford was part of the Montana University System’s lobbying team, which consisted of top campus administrators and three students. He represented all of MSU’s 15,421 students on issues such as a tuition freeze for Montana students, wage increases for state employees, funding to boost scientific research, and funding to renovate MSU’s obsolete Romney Hall.

Before going to Helena, Lankford had gained experience with the legislative process through a 2013 summer internship working in the office of New York’s junior senator in Washington, D.C.

“Garrett did an amazing job representing MSU students to the Montana legislature, and through this experience he learned how to be skillful in drafting policy, negotiating and collaborating,” said Linda Young, department head and professor in the Department of Political Science. “Not only did his skills increase, his aspirations did as well. I predict that this experience will be pivotal in how he envisions and achieves new opportunities.”
MSU SCIENTIST WINS INTERNATIONAL PRIZE FOR PIONEERING WORK ON NEUTRON STARS

Sachiko Tsuruta, a professor in the Department of Physics, received a 2015 Marcel Grossmann Prize for her pioneering work on neutron stars. The prestigious international prize is given every three years to recognize achievement in the fields of gravitation and general relativity.

The other individual winners this year are astrophysicists at Princeton University, Trinity College-Cambridge and the University of Tokyo. Previous winners included several Nobel Laureates, as well as famed cosmologist Stephen Hawking.

“We’re all thrilled for her,” said MSU solar physicist David McKenzie. “To be recognized for a fundamental discovery is awesome.”

Tsuruta, who has been at MSU since 1989, has investigated a variety of topics during her career that deal with dense stellar objects, such as neutron stars, black holes, white dwarfs, supermassive black holes and early universe problems such as first stars, gravitational waves and gamma ray bursts.

Her most important contribution to astrophysics is said to be her prediction that neutron stars existed. She made that prediction as a doctoral student and before pulsars were discovered in 1967. Pulsars are highly magnetized rotating neutron stars. Tsuruta also made predictions about the cooling and heating of neutron stars. The Hubble Space Telescope, ground-based telescopes and telescopes in X-ray satellite missions have since proven her predictions true.

Tsuruta’s findings have been published in more than 230 papers and shared in more than 330 lectures at national and international conferences.

Excerpted from Evelyn Boswell, MSU News Service

EARLY CAREER AWARD GOES TO MSU SCIENTIST WHO INVESTIGATES SOLAR CELL MATERIALS

Erik Grumstrup, an assistant professor in the Department of Chemistry and Biochemistry, received a five-year, $750,000 early career award from the U.S. Department of Energy.

The grant will allow Grumstrup and students working in his lab to continue their work examining the optical, electronic and chemical properties of materials important for advanced solar energy and electronics technologies, with the goal of understanding materials that may reduce the cost of solar cells and make them more efficient.

Grumstrup came to MSU in 2014 to join the new Materials Science Ph.D. Program, a Montana University System collaboration involving MSU, Montana Tech and the University of Montana. He is also teaching “College Chemistry I” and “Quantum Mechanics” in the Department of Chemistry and Biochemistry.

Chemistry department head Mary Cloninger said, “Erik’s research is very much on the cutting edge for materials science and spectroscopy. We are very fortunate to have such a talented, dedicated scientist as Montana State University’s first new hire for the new statewide Materials Science Ph.D. Program. The recognition of receiving a DOE early career research grant speaks to the outstanding quality of the research program that Erik Grumstrup is establishing at MSU.”

Grumstrup was born in Bozeman and moved away when he was about five years old. Noting that his return is a dream come true, Grumstrup earned his bachelor’s degree in 2006 from the University of Minnesota Twin Cities. He earned his Ph.D. in 2011 at the University of Colorado Boulder.

Excerpted from MSU News Service
MSU ASTROPHYSICIST RECEIVES PRESTIGIOUS INTERNATIONAL AWARD FOR YOUNG SCIENTISTS

Nicolas Yunes, an assistant professor in the Department of Physics, was the 2015 winner of the Young Scientist Prize administered by the International Union of Pure and Applied Physics (IUPAP), the world’s most prestigious award for young scientists conducting gravitational research.

The prize—which gives Yunes a medal, certificate and approximately $1,000—recognizes outstanding achievements of scientists who are in the early stages of their career. Recipients can work in any area of relativity and gravitation, but must have a maximum of eight years of research experience after earning their doctorate. They are expected to have shown significant achievement and exceptional promise for future achievements in relativity and gravitation.

The first IUPAP prize, given in 2013, went to an astrophysicist at the Massachusetts Institute of Technology (MIT). The second prize, given last year, went to an astrophysicist at Stanford University and Cambridge University.

“It’s truly a great honor,” Yunes said. “It’s rewarding to know that the work you do is appreciated by people outside of your university and outside of your group, by people that you don’t know and you have never met. It says that what you do matters, especially when it comes from people so well-respected in your field.”


Excerpted from Evelyn Boswell, MSU News Service

EARTH SCIENCES PROFESSOR GETS NATIONAL RECOGNITION AS INSPIRING WOMAN IN STEM

Julia Hobson Haggerty, an assistant professor of geography in the Department of Earth Sciences, was selected by INSIGHT Into Diversity magazine as one of its 100 Inspiring Women in STEM (science, technology, engineering and math). The award is presented to 100 women nationally whose work and achievements not only encourage others in their fields, but also inspire a new generation of young women to consider careers in STEM.

Haggerty also holds an appointment with the Montana Institute on Ecosystems. The institute is a community of Montana scholars studying Western landscapes to understand complex ecosystems, including their interconnectedness with people and nature.

In the past year, she received a U.S. Department of Agriculture grant to study how local communities can maximize benefits from energy development, co-authored a study published in the April 24 edition of Science on oil and gas development’s impact on North American ecosystems, was an invited speaker at a White House workshop on climate change and created three innovative new courses for MSU.

“I absolutely love teaching and love mentoring young people,” she said. “That’s where you really make a difference. Only a certain number of people will read your academic papers, but when you instill skills in future generations it has a real impact.”

Excerpted from Jodi Hausen, MSU News Service
MSU PALEONTOLOGISTS COAUTHORS PAPER ON ORIGIN OF BIRDS

MSU paleontologist David Varricchio and colleague Xing Xu, a professor at the Institute of Vertebrate Paleontology and Paleoanthropology in Beijing, China, published a paper in the journal Science on their findings that birds definitely descended from dinosaurs.

The paper said that recent discoveries of spectacular dinosaur fossils in China and elsewhere overwhelmingly support the hypothesis that birds are descended from theropod dinosaurs and “more important, demonstrate that distinctive bird characteristics such as feathers, flight, endothermic physiology, unique strategies for reproduction and growth, and a novel pulmonary system originated among Mesozoic terrestrial dinosaurs.”

Endothermic refers to warm-bloodedness. The novel pulmonary system is a complex respiratory system that involves air being shifted from air sacs to and from the lungs.

“The transition from ground-living to flight-capable theropod dinosaurs now probably represents one of the best-documented major evolutionary transitions in life history,” the paper continued.

The paleontologists said the origin of birds has been an enduring and dramatic debate. The theory has been that birds developed from a group of dinosaurs, but several issues remained unsolved until the recent discoveries of numerous well-preserved feathered dinosaur fossils from Jurassic and Cretaceous sediments. The fossils showed a wide variety of feathers that demonstrated a trend toward increasing complexity.

There were five co-authors of the paper. Xu, who is credited with revolutionizing ideas about the development of dinosaurs and for helping to make China into a paleontological powerhouse, was the lead author.

Varricchio is an expert on dinosaur reproduction and his contribution to the paper shows that many reproductive features associated with modern birds first evolved among carnivorous dinosaurs, particularly those close to the ancestry of birds.

Want to know more?
www.montana.edu/lettersandscience/2015/dinosaurs/

Excerpted from Evelyn Boswell, MSU News Service
Alayna Caffrey, a doctoral student in the Department of Microbiology and Immunology, has discovered a molecule that’s critical for the immune system and reducing the number of people dying from lung infections. She was the co-author of a paper describing her findings that was published in the January online issue of *PLoS Pathogens*, one of the top scientific journals in microbiology. Also in January, she presented her research at the Gordon Research Seminar on Immunology of Fungal Infections in Galveston, Texas. She was one of about 10 people who were selected to address the group, and she won first place for her presentation.

“This is a tremendous honor for her work, especially this early in her Ph.D. studies,” said immunologist Josh Obar, Caffrey’s thesis adviser.

Caffrey researches the early immune response against *Aspergillus fumigatus*, a common mold that can be found in soil or compost piles. The mold causes severe lung infections in people with weakened immune systems, perhaps compromised by leukemia, chemotherapy or organ transplants.

The death rate from *Aspergillus fumigatus* ranges from 30 to 90 percent, depending on the population, Caffrey said.

To help lower that percentage and understand what goes wrong in weakened immune systems, Caffrey looked at healthy immune systems to see how they respond to *Aspergillus fumigatus*. She discovered that a molecule called IL-1α is critical for recruiting white blood cells to an infection site.

“If you don’t have proper cell recruitment, mold is able to invade lung tissue and grow,” Caffrey said.

MSU co-authors on the paper in *PLoS Pathogens* were Margaret Lehmann, Julianne Zickovich, Christopher Watschke and Kimberly Hilmer. Co-authors from elsewhere were Vanessa Espinosa and Amariliz Rivera from the Center for Immunity and Inflammation at Rutgers University; Kelly Shepardson, Arsa Thammahong, Obar and former MSU researcher Robert Cramer from the Geisel School of Medicine at Dartmouth College; and Bridget Barker from TGen North in Flagstaff, Ariz. *PLoS Pathogens* is published by the Public Library of Science (PLoS).

Excerpted from Evelyn Boswell, MSU News Service

This image shows lung tissue that has a high level of germination for *Aspergillus fumigatus*. The tissue lacks a molecule that’s important for summoning white blood cells. Image courtesy of Alayna Caffrey.
ECOLOGY GRAD STUDENT RECEIVES NASA FELLOWSHIP TO EXPAND WHITEBARK PINE RESEARCH

Tony Chang, a doctoral student in the Department of Ecology, received a prestigious Earth and Space Science Fellowship from NASA that will allow him to expand his research into the die-off of whitebark pine.

In 2014, Chang and two collaborators published their findings about the impacts of climate change on whitebark pine in the Greater Yellowstone Ecosystem in *PLoS One*, an international scientific journal featuring research from all disciplines within science and medicine. The $30,000 renewable fellowship from NASA will allow him to do additional research that adds mountain pine beetles to his previous work on climate change.

“This is highly relevant to understanding and managing whitebark pine under climate change,” said Andrew Hansen, a professor in the Department of Ecology and Chang’s adviser.

Chang has already developed state-of-the-art climate models for whitebark pine in the Greater Yellowstone Ecosystem, Hansen said. The NASA fellowship will allow him to build on that work by adding another level of realism and incorporating information about the impact of mountain pine beetles. Using information gathered by satellites is a major component.

Want to know more?
www.montana.edu/lettersandscience/2015/chang/

Excerpted from Evelyn Boswell, MSU News Service

MSU INSTRUMENT TO STUDY SUN TAKES FLIGHT

An MSU-built experiment to study the sun was launched aboard a NASA-funded mission on Aug. 27, from White Sands Missile Range in New Mexico. The experiment, the Multi-Order Solar EUV Spectrograph, or MOSES-2, will give researchers insight into the transition region of the sun, the layer of material where the photosphere—the layer of the sun we see and which is about 10,000 degrees Fahrenheit—becomes the corona, which can reach millions of degrees. The fact the sun’s atmosphere is some 1,000 times hotter than its surface is one of the biggest mysteries in solar physics.

Within the transition region, many small explosive events occur at any one moment. Charles Kankelborg, associate professor and principal investigator for MOSES-2, doubts those explosions account for the extraordinary temperature of the corona, but he believes the underlying mechanism that drives the explosions may hold some answers.

Developed by faculty and students in the Department of Physics, MOSES-2 made a 15-minute journey into space on a Terrier-Black Brant IX suborbital sounding rocket. During its trip, it soared 187 miles high to take images of the Sun, and then parachuted back to Earth and was retrieved. The experiment, which is roughly 10 feet long, 22 inches in diameter and weighs 500 pounds, has been in in the works for more than nine years.

“For about one percent of the cost of a satellite mission, you can spend five minutes taking data in space. It’s a great way to demonstrate cutting-edge instruments and new ways of doing science,” said Kankelborg. “In a university setting, it’s easier to run a research program based on sounding rocket missions than satellite missions. You can get students involved in building instruments hands-on.”

The MOSES-2 launch is supported through NASA’s Sounding Rocket Program.

Want to know more?
www.montana.edu/lettersandscience/2015/MOSES/

Excerpted from MSU News Service
MSU, BOZEMAN SCHOOLS INVOLVED IN NATIONAL MATH STUDY

Seventy-two Bozeman teachers are participating in a groundbreaking national study led by researchers in the Department of Mathematical Sciences and collaborators in Virginia and California.

Funded by a $1.3 million grant from the National Science Foundation, the three-year IMMERSION project will examine how intensive training can affect teachers’ use of mathematical modeling in the classroom. The Common Core State Standards for Mathematical Practice, recently adopted by Montana and most other U.S. states for their K-12 curriculum, identify mathematical modeling as one way that students should use mathematics to solve problems encountered in the workplace and life. Mathematics education research has shown that students who work on such real-world problems feel less anxiety about mathematics and are more likely to see mathematics as relevant and useful.

To be considered mathematical modeling, a classroom task may have more than one possible solution, and the methods required to solve it may not be obvious in the problem. It’s usually up to the students to decide how to gather information needed for a solution and how to express that information mathematically, giving students more creativity and choice than they may be accustomed to in a math class. Once students develop their own working models for a solution, they can test and refine the models for an even more accurate solution.

Elementary teachers may not be prepared to teach mathematical modeling. The project leaders said IMMERSION will help K-8 teachers incorporate modeling into their mathematics teaching by providing intensive professional development training during the summer, followed by support and collaboration during the school year.

Want to know more? www.montana.edu/lettersandscience/2015/IMMERSION/

Excerpted from Evelyn Boswell, MSU News Service

PARTNERING WITH TRIBAL COMMUNITIES TO ADDRESS HEALTH DISPARITIES

Monica Skewes, an assistant professor in the Department of Psychology, is partnering with the Assiniboine and Sioux tribes of the Fort Peck Indian Reservation in northeastern Montana on a collaborative research project to address health disparities related to substance abuse. The project is funded by the National Institutes of Health through MSU’s Center for Health Equity in Rural Montana. The project aims to merge local cultural knowledge with established evidence-based practices to minimize substance abuse and associated physical and mental health consequences.

Substance abuse and mental health problems frequently co-occur and disproportionately affect rural and American Indian communities in Montana. Striking disparities in substance abuse, and associated problems such as suicide, accidents and cancer, have been documented in many reservations and are priority areas of concern. Poverty, underemployment and lack of opportunity are underlying social determinants of disparities in health outcomes.

“At the same time, every community has stories of resilience and recovery, sometimes despite formidable obstacles and in the absence of professional treatment,” said Skewes.

The Fort Peck Substance Abuse and Resilience Project is a first step toward building a community-based, culturally grounded public health intervention to reduce harm from substance abuse. The project examines both risk and protective factors to identify strategies people use to maintain or restore health and balance to their lives. Skewes uses a Community Based Participatory Research (CBPR) framework and mixed qualitative and quantitative methods. By examining the ways in which people of reservation communities support recovery from substance abuse and mental health problems, communities may be empowered to harness resilience and nurture wellbeing.

Monica Skewes. Photo by Nathan Norby.

Elizabeth Burroughs is an associate professor of mathematics education and co-principal investigator for the IMMERSION project. MSU photo by Amy Shertzer.
MSU ALUMS RECEIVE FULBRIGHT PROGRAM AWARDS TO PURSUE INTERNATIONAL RESEARCH PROJECTS

Megan Rothstein, a 2015 graduate with a degree in cell biology and neuroscience from Billings, Mont., won a 2015 Fulbright research fellowship to Germany to continue her research on Parkinson’s disease at the University of Bonn’s Institute for Reconstructive Neurobiology.

While at MSU, Rothstein worked in the lab of Renee Reijo Pera, MSU’s Vice President of Research and Economic Development and an internationally known stem cell researcher, on cells linked to Parkinson’s disease.

Reijo Pera said that Rothstein is someone people should not underestimate, pointing out that, as an undergraduate, she stepped right into the Parkinson’s-related research, working on delicate techniques to grow neurons, essentially brain cells, in vitro. The process of taking a stem cell and turning it into a very specific brain cell—a mid-brain, dopaminergic neuron—can take up to 50 days.

Rothstein, who will be doing similar research in Bonn, said she became interested in medical science after working as a nurse’s aid and in elder care while attending MSU. It was there that she came face-to-face with what Parkinson’s disease could do to a person.

“For a while I waffled between patient care and research,” she said. “But after working in Renee’s lab and seeing that there is this real potential that we can make some of these diseases obsolete, it became really clear. I really like the lab experience. It just happens that I’ve been really fortunate in having this chance to work with someone doing groundbreaking research at MSU. I’ve been really lucky.”

Brent Zundel, a 2013 graduate with duel degrees in Spanish and engineering, also from Billings, received a 2015 Fulbright research grant, which will allow him to spend up to nine months at the University of Concepción in Chile studying water resource issues facing the Patagonia region. Zundel will take a sabbatical from his job as a water resources specialist with the Montana Department of Natural Resources and Conservation (DNRC).

The stay in Concepción, which is Chile’s second-largest city and located near its geographic center, will mark Zundel’s second visit to the elongated South American country. He did a study-abroad program at Austral University in 2010.

With its modern infrastructure and once-again robust democratic institutions, Chile is the second largest economy in South America behind Brazil. Much like Montana, natural resources and tourism are major economic drivers for the Patagonia region. While timber and mining often come to mind, Zundel said water is an increasingly important resource.

“I’ll be looking at ways the Chileans administer water rights, which will be interesting given that I’ve been working on water resource issues for DNRC,” Zundel said.

The Fulbright Program is the flagship international educational exchange program sponsored by the U.S. government. Established in 1946, the program operates in more than 155 countries, and has given more than 318,000 students, scholars, teachers, artists, scientists and other professionals the opportunity to study, teach and conduct research, exchange ideas and contribute to finding solutions to shared international concerns.

Excerpted from MSU News Service
MONTANA PROJECT ARCHAEOLOGY PROGRAM WINS PUBLIC OUTREACH AND EDUCATION AWARD

The Montana Project Archaeology (MTPA) program received a 2015 Historic Preservation Award for Outstanding Preservation Education and Outreach from the State Historic Preservation Office. The MTPA program, which is coordinated by Crystal Alegria, began in 2003 and is housed within the Department of Sociology and Anthropology. The MTPA program hosts a variety of professional development courses, institutes and workshops for instructors in Montana to teach archaeology in K-12 classrooms and promote a preservation ethic. The program also works with Montana teachers to provide hands-on archaeological experiences for elementary students throughout the state.

MTPA is part of the national Project Archaeology program, which is also housed in the Department of Sociology and Anthropology at MSU. The national program is sponsored by the Bureau of Land Management as a response to widespread looting and vandalism of archaeological sites. Since its inception, more than 7,000 educators have participated nationwide in Project Archaeology workshops. These educators use Project Archaeology materials to instruct an estimated 180,000 students of all ages annually.

In Montana, the MTPA program has developed archaeological curricula for teachers specifically about our state, such as their most recent publication about the Anzick archaeological site, entitled “Investigating the First Peoples: The Clovis Child Burial.” Another recent project centers on the archaeology of historic mining in Montana and is called “Investigating Garnet, a Historic Mining Town.” All of the curriculum they develop, and the workshops and courses they host, have a place-based focus, bringing educators and students out to the places where history has happened and archaeology is preserved, including Virginia City and Fort Parker near Livingston, the home of the first Crow Agency.

WRITING STUDENTS VOLUNTEER FOR THE “DON’T FENCE ME IN” PROJECT

Writer and poet Carl Sandburg wrote, “Love your neighbor as yourself, but don’t take down the fence,” but MSU writing students are not listening. For five years, the students have partnered with the National Parks Conservation Association (NPCA) to tear down old, dilapidated fences and put up non-barbed fencing to allow elk, deer and pronghorn populations to safely reunite with other herds, migrate without harm in the Yellowstone Basin and to expand grazing habitats.

English instructor Jill Davis uses WRIT 101, her community-engaged writing class, to explore the natural world and how it impacts identity, specifically how issues related to wildlife, natural resources and habitats in the Greater Yellowstone Ecosystem directly impact our lives. The pronghorn fencing project allows students to tangibly connect with the landscape while providing safe spaces for humans and wildlife.

“To be honest, I didn’t even know what a pronghorn was until a week ago,” says Francesca Townsend, one of Davis’ WRIT 101 students. “But it’s awesome that we can come down to Paradise Valley on weekends and change their future by tearing down old fencing and building new non-barbed and more accessible fence lines to help these beautiful creatures get to crucial habitats.”

“The Northern Yellowstone herd dwindled to a mere 190 individuals in the 1990s,” noted Stephanie Adams, Yellowstone Program Manager for the NPCA. “Since 2010, the NPCA and its volunteers have modified around 18 miles of fence to pronghorn-friendly standards to bring the herd’s population up to 400 and the animals are expanding their range north. A good part of that is due to volunteers like our MSU students who are modifying fence lines in this beautiful region.”


“Investigating Garnet, a Historic Mining Town” by Stephanie Adams.

“Don’t Fence Me In” by the National Parks Conservation Association.

www.montana.edu/lettersandscience
COLLEGE OFFERS NEW ASIAN STUDIES PROGRAM

In order to educate students to be competitive in the “Pacific Century,” a term some use to describe the 21st century in recognition of the growing economic and geopolitical influence of the Asian-Pacific region, MSU is launching an interdisciplinary Asian studies major and minor. Pending final approval by the regional accreditation agency, the program will go into effect in spring 2016. This new program will replace the existing Japan studies major and minor options currently offered in the Department of History and Philosophy.

The interdisciplinary Asian studies options incorporate an array of academic disciplines in several MSU departments, including History and Philosophy, Modern Languages and Literatures, Sociology and Anthropology and Earth Sciences. The program will be housed in the Department of Modern Languages and Literatures and Hua Li, associate professor of Chinese, will be the interim director during the first year.

The program should appeal to students within the College of Letters and Science, as well as other colleges such as engineering and business. Besides taking core Asian studies courses, students can choose between a Japan Focus and China Focus. These options reflect shifting U.S. strategic concerns in the Asia-Pacific region in recent years, as well as significant geopolitical and economic changes in Asia, changes that have resulted in students’ desires to learn the languages and to study the cultures of China, Japan and other Asian countries.

The new program will enable students not merely to learn about single nations within Asia, but also to gain some basic knowledge of Asia as a whole, and to understand how these nations’ histories, cultures, politics and environments have been and are increasingly intertwined. In addition, the Asian studies options at MSU will reflect the interdisciplinary culture of Montana’s land-grant institution, and better prepare MSU students for employment in a host of international fields and occupations.

MSU ACQUIRES PAPERS OF RENOWNED AUTHOR IVAN DOIG

The papers of the late Ivan Doig, called “a presiding figure in the literature of the American West,” will return to the writer’s native state, finding a home in the MSU Library’s Special Collections and Archives.

“Ivan’s archive is coming home,” Carol Doig said in announcing the commitment of her husband’s manuscripts, file cards, drafts, slides, tapes and other materials to MSU.

Doig, who grew up in White Sulphur Springs and Dupuyer, Mont., was a writer of international acclaim who published 16 volumes of fiction and non-fiction. His first book, This House of Sky: Landscapes of a Western Mind, a poetic memoir published in 1979, was a finalist for the National Book Award. Doig then turned to writing fiction that perennially hit best-seller lists. His final book, Last Bus to Wisdom, was published in August.

Although he had lived in Seattle for many years, the lives of his characters more often than not shared Doig’s Big Sky roots. In his obituary, the New York Times wrote that Doig “created a body of work that helped shape our understanding of rural working-class life in the postwar American West.”

The College of Letters and Science, which partnered with the MSU Libraries in the bid to bring the archive to MSU, will integrate the papers into several teaching, research and scholarly activities.

Nicol Rae, dean of the MSU College of Letters and Science, said the college plans a scholarly conference on Doig’s legacy to be held in 2017. He added that the arrival of the Ivan Doig Collection at MSU, following the appointment of Rick Bass as the college’s first Western Writer-in-Residence earlier this year, cements MSU’s standing as a major center of excellence for teaching and scholarship on the American West.

“The arrival of the Doig collection will have a transformational impact on teaching and scholarship on the American West at MSU,” Rae said.

Excerpted from MSU News
**AGRICULTURAL ECONOMICS AND ECONOMICS**

Gregory Gilpin, associate professor in the Department of Agricultural Economics and Economics, studies crime and punishment disparities within U.S. public schools, including the unintended effects of public policies such as compulsory schooling laws, school discipline guidelines and government mandates. This research is of particular interest due to schools’ disciplinary decisions significantly limiting certain students’ access to education by removing those students from the familiar learning environment of their schools.

The unintended effects of good public policy are explored in “Compulsory Schooling Laws and School Crime” authored by Greg Gilpin and Luke Pennig (former DAEE graduate student) and published in *Applied Economics*. Extensive literature demonstrates that compulsory schooling laws improve educational attainment, wellbeing, civic involvement and labor market outcomes. However, denying at-risk youth access to schools for disciplinary reasons may negatively impact the learning environment and school safety. The empirical analysis indicates that raising the minimum dropout age requirement above 16 increases crime committed within U.S. public high schools by 18.5 percent, and that these effects persist for at least four years after passage and are more intensive in metropolitan areas. Analysis by category of crime reveals schools incur more physical attacks, but no change in illegal drug and property crimes.

Gilpin joined the Department of Agricultural Economics and Economics as a general economist in fall of 2009. His primary focus is on the economics of education, the teacher labor market and the economics of information.

**CELL BIOLOGY AND NEUROSCIENCE**

Matthew Byerly, M.D., a psychiatrist and scientist whose research focuses on improving treatments for individuals living with mental illness, was selected as the new director of MSU’s Center for Mental Health Research and Recovery, or CMHRR. He succeeds interim director Frances Lefcort, professor and head of the Department of Cell Biology and Neuroscience.

Byerly’s research interests have included clinical effectiveness research, a type of research that studies the impact, including cost-effectiveness, of different mental health care approaches in real-life clinical settings. He also conducts clinical and translational studies of interventions for people who have fragile X syndrome and Down syndrome, two of the most prevalent neurodevelopmental disorders.

Byerly, who is a member of the faculty in the Department of Cell Biology and Neuroscience, was a professor at the University of Texas Southwestern Medical Center before coming to MSU.

“We are thrilled that Dr. Byerly will be leading our efforts to improve the diagnosis and treatment of mental illness for all of Montana,” Lefcort said. “Montana has one of the highest suicide rates in the country, and Dr. Byerly is especially interested in developing and implementing strategies to address this problem. He brings tremendous clinical research expertise to MSU and to the state and really puts our center on the map as an innovative program that aims to combine excellence in research in both the basic neuroscience and clinical and translational research underlying serious mental illness.”

The CMHRR is an interdisciplinary center that is designed to use research to improve the diagnosis and treatment of mental illness through collaborative efforts between neuroscientists, clinicians, engineers, people affected by mental illness and their families. The center was established in the fall of 2014 and draws on MSU’s research strength in neuroscience, electrical engineering, computer science, biochemistry, psychology and nursing, among other disciplines.
CHEMISTRY AND BIOCHEMISTRY

Tom Livinghouse, a professor in the Department of Chemistry and Biochemistry, and graduate students Bryce Sundahl and Adrian Smith, have developed an inexpensive and environmentally friendly way to sequentially produce carbon-nitrogen and carbon-carbon bonds commonly found in antibiotics and other pharmaceuticals for humans and animals. The results of their research were published in the German journal *Angewandte Chemie*, one of the most select journals in the field of organic chemistry.

Organic chemists often produce a mixture of unneeded products in the process of making the one they want, Livinghouse explained. As a result, they often throw much material away and keep the one they want. It’s a long-standing and intractable problem in organic chemistry.

The MSU team developed a one-step process that largely eliminates waste products. The process is extremely efficient, and it saves time and money. Livinghouse describes it as green chemistry because the process is non-toxic and produces few byproducts. If done right, it minimizes the needs for external solvents.

The MSU team isn’t the first to come up with the idea, but the techniques developed by other groups over the past 15 years have had very limited application, Livinghouse said.

“What we did can apply to a great many pharmaceuticals,” he said.

Livinghouse said he came up with the idea about three years ago, but he praised his graduate students for making it happen over the past year. He said their work in the lab was critical to the success of the project and the newly published paper.

EARTH SCIENCES

Dave McWethy, an assistant research professor in the Department of Earth Sciences, received a Fulbright scholar grant to research fires in central Chile and teach at the University of Concepción. Concepción is Chile’s second largest city and located near the center of the country.

“It’s an important time to look at wildfires,” said McWethy. “There have been some really large fires happening right now that are threatening communities and rare forests throughout central Chile.” Recent large fires near Valparaíso and Santiago destroyed thousands of homes and forced more than 10,000 people to evacuate.

McWethy will start his fieldwork in January, focusing on Araucaria araucana forests and wild fires. On March 1, the beginning of the university’s fall semester, he will start teaching a seminar on global fire ecology and a field course on reconstructing historical conditions. His Fulbright ends June 30.

Araucaria araucana forests grew all over the prehistoric world, but they are becoming increasingly rare, McWethy said. The tree now grows in the central region of Chile, as well as parts of Argentina, Australia and New Zealand, but it is listed as endangered.

Scientists think fire activity is increasing because non-native, more flammable shrubs and tree plantations are replacing native vegetation that is more fire resistant. For example, Eucalypt trees that are native to Australia and pine trees native to the United States grow near the Araucaria araucana forests, as well as near cities and towns throughout much of central Chile. All are highly flammable, McWethy said.
DEPARTMENT HIGHLIGHTS

ECOLOGY

Cheyenne Stirling, a senior in the Department of Ecology from Shelby, Mont., was MSU’s first recipient of a Jerry O’Neal National Park Service Student Fellowship. Stirling received the fellowship for her work inspecting hundreds of buildings in Glacier National Park over the summer for signs of bats.

Discovering where bats roost—or might roost—will help the park prepare for the possible arrival of white-nose syndrome, said Stirling. White-nose syndrome, which is caused by a cold-loving fungus that spreads between bats that are hibernating in close quarters, produces a powdery white fungus on the nose and wings of bats. It has killed more than 5.7 million bats so far in North America, leading to uneaten insects that threaten crops.

“If we know where bats are roosting or potentially going to be, if the white-nose syndrome comes closer to Glacier, we can have this documented already,” Stirling said. “We can go straight to the biggest roost areas.”

Since returning to MSU this fall, Stirling has been compiling and analyzing her data. She will also prepare a presentation of her findings for The Wildlife Society meeting in February. She will graduate in December with a degree in fish and wildlife management and a minor in environmental horticulture. After that, she’s thinking of a career in research, perhaps in Alaska.

“I would really like to continue in the field of researching bats, because I think it’s really interesting,” Stirling said.

The Jerry O’Neal National Park Service Student Fellowship is named for the former deputy superintendent at Glacier National Park, in honor of his dedication to science and research in the National Park Service.

MSU ecology professor Bob Garrott was among the scientists and conservation experts featured in the film Unbranded, which was released in September. The MSU-linked feature-length documentary won the audience choice awards at both the 2015 Telluride Mountainfilm Festival and Toronto’s HotDocs festival, which is the largest documentary film festival in the world.

The visually stunning film traces the epic adventure of four young graduates from Texas A&M University and the string of 16 mustangs that they adopt and train to traverse backcountry stretching from the Mexican desert to the high-country of Glacier National Park. Running 105 minutes, it is an adventure story of the cowboys as they come of age in some of America’s most iconic landscapes. It is also an educational film about the difficulty of managing wild horses in America.

“Unbranded unfurls an incredible story of adventure and self-discovery while spotlighting the plight of wild horses in America,” according to the Telluride Mountainfilm Festival press release.

Garrott’s research includes the population dynamics of wild horses in the American West. In 2013, he published a paper in the journal Science that detailed the issues associated with wild horse overpopulation, and offered solutions to improve conditions for wild horses while protecting Western rangeland from the negative impacts of wild horse overpopulation. The paper, which was coauthored by Mandan Oli of the University of Florida, Gainesville, recommends the use of a contraceptive vaccine combined with changes in herd management and animal sales/adoption to control herd size.

Unbranded, was directed by MSU film graduate Phillip Baribeau and produced by Dennis Aig, director of the MSU film program. MSU graduate Scott Chestnut edited the film. Kathy Kasic, currently a member of the MSU School of Film and Photography faculty and a graduate of MSU’s MFA in science and natural history filmmaking program, did much of the Nevada unit work in the film.
ENGLISH

John Stifter, an alumnus of the Department of English and the editor of Powder magazine, came to MSU in February to participate in a forum on snow science and the human factor in avalanche risk hosted by the snow science program in MSU’s College of Letters and Science.

Stifter, who grew up in Spokane, Wash., transferred to MSU after starting at Syracuse in pursuit of a bachelor’s in journalism. While he was still focused on a career in journalism, Stifter said he chose to swap Syracuse for Bozeman for one reason above all others—skiing. The degree in journalism was swapped for an English degree. He graduated in 2006 with a double major in English and history.

Stifter said his journalism training got its start with an internship at Outside Bozeman magazine. An internship at Powder followed. By 2007, after a stint covering skiing for ESPN, he was back at Powder full time as an associate editor. By the time Stifter was 29 years old he was editor.

From Japan to Europe to South America, Stifter has traveled the world writing about the sport of skiing and the mountain culture that surrounds it. Stifter said his job at Powder is the culmination of pursuing a dream that dawned when he first realized you could make a career out of ski journalism.

HISTORY AND PHILOSOPHY

Faculty in the Department of History and Philosophy have published five books in the past year.

Regent’s professor Brett Walker’s new book, A Concise History of Japan, tackles key themes regarding Japan’s relationships with its minorities, state and economic development, and the uses of science and medicine. The book traces the country’s early history through archaeological remains, before proceeding to explore life in the imperial court, the rise of the samurai, civil conflict, encounters with Europe, and the advent of modernity and empire. The book concludes by describing Japan’s ascension from the ashes of the Second World War into the thriving nation of today.

In Turks Across Empires, James Meyer, assistant professor of history, tells the story of the pan-Turkists, Muslim activists from Russia who gained international notoriety during the Young Turk era of Ottoman history. Today the pan-Turkists are remembered as the forefathers of Turkish nationalism, but in the decade preceding the First World War they were known among bureaucrats, journalists and governmental officials in Russia and Europe as dangerous Muslim radicals.

In her book Cartophilia, assistant professor of history Catherine Dunlop examines mapmaking and map reading during the period between the French Revolution and the Second World War in Alsace-Lorraine, a disputed borderland between France and Germany. The region endured devastating wars from 1870 to 1945 that altered its border four times. Maps were essential tools for border populations whose lives were turned upside down by the French-German conflict.

History professor Michael Reidy published The Correspondence of John Tyndall, Volumes I and II, which is comprised of approximately 8,000 transcribed letters written by John Tyndall. Tyndall was a contemporary of naturalist Charles Darwin, biologist Thomas Huxley and chemist/physicist Michael Faraday, all renowned British scientists of the 1800s. Tyndall published significant works on electro-magnetism, thermodynamics, sound, glaciers, global warming and spontaneous generation.
LIBERAL STUDIES

The online liberal studies bachelor’s degree completion program, developed for students who have completed at least two years of college and would like to earn a bachelor’s degree online, saw its first five graduates in 2015. Since its inception in 2012, more than 90 students have enrolled in the fully online program. Two more students are expected to graduate in December.

The online liberal studies program has been extremely popular with students within Montana and across the country who started college and earned at least 60 credits, but, for a variety of reasons, didn’t finish their degree. The program is also open to students who have an associate’s degree and want to earn a bachelor’s.

The program has provided a new opportunity for students based in rural areas to complete their degree without relocating to Bozeman.

“All of our students started college at some earlier point in their lives but then life, work or family forced them to leave without a degree,” said Tami Eitle, associate dean of the College of Letters and Science and director of the liberal studies program. “Our online program is allowing these students to return to college and they will earn a degree from MSU whether they are in rural Montana, Arizona or Mexico. Completing a college degree may bring better job opportunities, higher earnings and more self-confidence, but for many of our students it is also a dream fulfilled.”

MSU’s degree completion program is interdisciplinary. Students complete credits in four main subject areas: arts, humanities, natural science and social science. Online classes cover a range of subjects, including earth sciences, Spanish, sociology, history, photography, nutrition and political science.

MATHEMATICAL SCIENCES

David Ayala, assistant professor in the Department of Mathematical Sciences, recently received a three-year, $83,000 grant from the National Science Foundation for his project entitled, “Factorization Homology and the Cobordism Hypothesis.” Given the scarcity of federal dollars available to fund pure or abstract mathematics research, combined with the fact that Ayala is in the early stages of his career, this is a very impressive feat.

Ayala’s research program is within the field of algebraic topology, which merges abstract geometry with abstract algebra. His work develops a dictionary of sorts, called “factorization homology,” between geometric notions and algebraic ones. Factorization homology is an algebraic recasting of functional path integrals that arise in quantum physics, the examination of which is notoriously difficult.

“Abstract math offers a deep experience of taking ownership over ideas that are unobstructed by physical materials, can sustain unbounded creativity, and are saturated with intricacies and interacting complexities that are as robust as a mind can allow. These ideas manifest the distillation of extraordinary and creative human thought from millennia prior,” said Ayala when asked about the importance of funding pure mathematics research. “It is important for a community to continue this tradition of human development and offer this experience to students.”

Ayala, who joined the faculty at MSU in 2014, also received a 2015 MSU Faculty Excellence Grant, which decreases his teaching duties providing more time for research and working with graduate students. Ayala earned his Ph.D. in mathematics from Stanford University, and was a postdoctoral research fellow at the University of California, Berkeley and Harvard University before coming to MSU.
MICROBIOLOGY AND IMMUNOLOGY

Eric Boyd, assistant professor in the Department of Microbiology and Immunology, will serve as the deputy director of the “Rock-Powered Life” team led by the University of Colorado and funded with a new five-year, $7 million grant from NASA. Scientists from a variety of disciplines and institutions will work together to understand how rocks and water interact at low temperatures to release energy capable of supporting microbial life.

Their findings will inform our understanding of the processes that fueled early life on Earth, as well as the habitability of Mars and icy satellites like Europa, Boyd said. Their fieldwork will take them to an observatory in Oman and the California Coast Range. It will also involve drilling deep into the North Atlantic Ocean to obtain samples. These environments were chosen because they have exposed iron-rich ultramafic rocks that at one time were part of the Earth’s upper mantle, Boyd said.

“Rocky planets store enormous amounts of chemical energy that can power living systems when this energy is released through the interaction of rocks with water,” Boyd said. He added that chemical energy released when ultramafic minerals interact with water is thought to have fueled early primitive forms of life.

“We suspect these environments will still harbor ancestors of these early primitive forms of life,” Boyd said. “Identifying what primitive forms of life look like and what minerals are formed as a result of their activity will help inform our search for life outside of Earth.”

Mark Quinn, a professor in the Department of Microbiology and Immunology, was the senior author of a paper detailing a chemical compound that shows potential for treating rheumatoid arthritis. The paper was published in the June issue of the Journal of Pharmacology and Experimental Therapeutics (JPET).

Rheumatoid arthritis is a chronic autoimmune disorder that affects an estimated 1.3 million people in the world, Quinn said. Characterized by stiff, swollen joints, it’s a progressive disease that occurs when the body’s immune system attacks its own cells. Inflammation in the lining of the joints leads to loss of bone and cartilage. People who have rheumatoid arthritis lose mobility and joint function without adequate treatment.

New kinds of drugs have been developed for treating the disease, Quinn said. Called biological drugs, or “biologics,” they are made from genetically engineered proteins or antibodies that act on substances in the immune system. When used to treat rheumatoid arthritis, they interrupt signals that fuel the inflammatory process. Two such drugs are ENBREL and HUMIRA. Biologics can be expensive, however, and some people don’t respond to them, Quinn said. Some people respond at first, but not forever.

Quinn’s research team conducted a new study on a previously discovered chemical compound, called IQ-1S, to understand how the small-molecule compound works against rheumatoid arthritis. They found that IQ-1S significantly reduced the severity of collagen-induced arthritis, which is a model for rheumatoid arthritis, and inhibited the destruction of cartilage and bone. The compound worked because it targeted kinase proteins that send out signals for destructive and inflammatory activities. Since IQ-1S inhibited the kinase activities, it suppressed inflammation in joint tissue and lymph node cells.
MODERN LANGUAGES AND LITERATURES

During summer 2015, the Department of Modern Languages and Literatures, in collaboration with the Department of Cell Biology and Neuroscience, offered its first healthcare-focused study abroad trip in León, Nicaragua. Patricia Catoira, associate professor of Latin American studies, coordinates the program.

Twelve students in health-related fields participated in the first year, volunteering at a public hospital and taking a one-on-one medical Spanish class. The healthcare-focused program mirrors an ongoing six-week summer program in León, which includes MSU students from all fields and provides the option of volunteering at a youth center, that Catoira has coordinated for the past three years.

Surrounded by volcanoes and 20 kilometers from the Pacific Ocean, León is the intellectual center of Nicaragua and home to most of its universities. As the traditional stronghold of Sandinism in the country, the city is rich in political history as well. The scarcity of foreigners, due to the lack of tourism infrastructure and services in the area, maximizes the students’ cultural and linguistic immersion. Students further enhance this immersion by staying with Nicaraguan families.

At the only local public hospital in León, MSU students get to experience the Nicaraguan healthcare system first hand. The system is free but underfunded and understaffed, so the hospital welcomes help from the MSU students. Depending on their skills, students get to perform medical tasks such as checking vital signs, running blood screens and performing EKG tests. They also learn about common third-world and tropical diseases such as insect-born dengue and Chikungunya. Above all, students get to practice and enrich their Spanish skills and cultural attunement through their daily interaction with Nicaraguan patients and healthcare providers.

With the success of this year’s trip, the department hopes to offer the program every summer.

NATIVE AMERICAN STUDIES

A national diversity publication named MSU one of the nation’s top 100 institutions for awarding degrees to Native American students. MSU shared the 96th spot for the number of undergraduate degrees awarded to Native American students, while it shared the 91st spot for the number of graduate degrees awarded to Native American students. For master’s degrees awarded to Native American students, MSU was ranked 63rd.

The rankings are from Diverse Issues in Higher Education, a national news magazine devoted to matters of access and equity for all in higher education. They use the most recent available data from the U.S. Department of Education to identify higher education institutions from around the country that confer the most degrees to minority students each year.

The university’s long history of supporting Native American students dates back to at least 1967, when the first Native American student adviser was hired, according to Walter Fleming, head of the Department of Native American Studies, or NAS. In 1974, the position became part of NAS. Since then, the Office of American Indian and Alaska Native Student Success in NAS has provided important services to Native students, such as tutoring and short-term loan assistance, Fleming said.

Rita Sand, one of the NAS student advisers, won the MSU Outstanding Academic Advising Award in 2015.

“IT’s also important to note that the American Indian Council—the Native student organization on campus—provides a sense of belonging and brings to campus and the Bozeman community cultural enrichment by sponsoring, along with Native American Studies, the annual Pow Wow,” Fleming said.
PHYSICS

When a total solar eclipse occurs in 2017, college students from all over the United States will monitor it by sending weather balloons to the upper edge of the Earth’s atmosphere. Faculty and students at MSU will be leading and coordinating this nationwide effort.

Angela Des Jardins, director of NASA’s Montana Space Grant Consortium and an associate research professor in the Department of Physics, came up with the idea for the balloon project and presented it at a national conference last year. She then got the job of implementing it. Realizing that Aug. 21, 2017, the date of the eclipse, isn’t as far off as it seems, Des Jardins recently encouraged MSU students and faculty to become involved. A variety of teams, even a team for organizing teams, will be needed for success, she said. Schools in 42 states have already signed up.

Excited about the opportunities ahead, Des Jardins said the balloon network will engage the public by allowing them to follow the eclipse from anywhere in the world. The network will also advance science and technology and help develop the work force by engaging thousands of students.

She added that viewing an eclipse is amazing in itself. The last total solar eclipse that could be seen in the continental United States occurred in 1979.

The 2017 eclipse will only be partial across Montana, so the MSU balloon team will launch its high-altitude balloons from Rexburg, Idaho, it’s the closest spot to Bozeman to see the total eclipse. The eclipse there will last two minutes, compared to 25 seconds at the edge of the eclipse’s path.

Last March, the National Science Foundation (NSF) awarded a $14.5 million grant to the North American Nanohertz Observatory for Gravitational Waves (NANOGrav) to establish a Physics Frontiers Center (PFC) for detecting gravitational waves, an achievement expected to offer radical new insights about the universe. MSU astrophysicist Neil Cornish is a senior member of the center, and his research group will receive $403,000 under the award.

“The funding from the NSF to Dr. Cornish and his colleagues is well-deserved,” said Renee Reijo Pera, MSU’s Vice President of Research and Economic Development. “This funding supports the establishment of the Extreme Gravity Institute at MSU, which is one of our key research priorities. We are most pleased to be a part of the project.”

The NANOGrav PFC will be a virtual center that will look at black holes so huge that they take months to years to complete their orbits, Cornish said. It will provide a unique opportunity for astronomers and solar physicists to work together.

According to the research team, the NANOGrav PFC will address a transformational challenge in astrophysics: the detection of low-frequency gravitational waves. Gravitational waves are elusive ripples in the fabric of space-time, which theories predict should arise from extremely energetic and large-scale cosmic events. Examples of such events include orbiting pairs of massive black holes found at the centers of merging galaxies, phase transitions in the very early universe, or as relics from cosmic inflation, the period just after the Big Bang when all of the universe that we can see expanded rapidly from a minuscule volume in a tiny fraction of a second.
MSU student Maurisa Bell signs a peace wall in the Protestant neighborhood of Shankill Road in Belfast, Northern Ireland. It is customary to write on the walls. Photo courtesy of David Parker.

POLITICAL SCIENCE

Last spring, David Parker, an associate professor in the Department of Political Science, accompanied 17 MSU students on a study abroad trip to the United Kingdom where they spent three weeks studying the British political system. Their goal was to use the United Kingdom as a window to better understand our own political system. They travelled to London, Edinburgh, Belfast and Derry to meet with academics and political leaders.

They learned firsthand about the devolution of powers to regional legislatures, how active and retired legislators viewed their roles as representatives, and whether Scotland could ever become independent after the defeat faced by pro-Independence forces in September 2014. They also experienced the horrors of The Troubles—the common name for the ethno-nationalist conflict in Northern Ireland—and witnessed how the Northern Ireland Assembly still struggles to bring peace to a region long divided by religion and violence.

Students learned other important lessons, including how to survive rush hour on the London Tube, the proper way to put jam on a scone, that haggis is not as horrible as it sounds and that fried candy bars are a divine culinary experience. They visited the Magna Carta on its 800th anniversary, toured thousands of years of the human experience via the British Museum, and watched Prime Minister David Cameron and Labour Party leader Harriet Harmon tousle at the opening of the new Parliament in the Queen’s Speech debate.

It was a whirlwind adventure where everyone developed a deeper appreciation for the value of travel, the special relationship America enjoys with the United Kingdom, and the real (yet wonderful) differences between the U.S. and British political experience and culture that exist despite our common language and history. Parker plans to repeat the experience in spring 2017.

MSU students pose at the top of Edinburgh Castle. Front row, from left to right: Devlyn Gogan, Meghan Bailey, Madison Hanson, Ashley Finley, Caitlyn Richter, Maurisa Bell, Charlie Bernstein and Dean Kayler. Back row, from left to right: Shane Lavers, Ben Walker and Matt Bussey. Photo courtesy of David Parker.

MSU students head to the Imperial War Museum on the south side of the River Thames in London. Photo courtesy of David Parker.
PSYCHOLOGY

Professor Jessi Smith was selected for the Champions Board of the National Girls Collaborative Project (NGCP). NGCP is a national effort that brings together organizations throughout the U.S. that are committed to informing and encouraging girls to pursue careers in science, technology, engineering and mathematics (STEM). NGCP’s Champions Board includes representatives from industry, museums, national organizations like the Society of Women Engineers and the National Center for Women in Information Technology, and universities, including Stanford, Yale and the Massachusetts Institute of Technology.

“It’s always wonderful when Montana can be represented at the national level as a STEM champion,” said Suzi Taylor, co-leader of the Montana Girls STEM Collaborative. “Jessi brings energy, passion and research-based knowledge to a situation we strive to change, the under-representation of women in STEM careers.”

At MSU, Smith is also the director of the ADVANCE Project TRACS program, a National Science Foundation-funded effort to broaden the participation of women faculty in STEM and underrepresented areas of social and behavioral science. Smith is also an accomplished researcher whose work has been published in several national scientific journals.

The Montana Girls STEM Collaborative is an outreach program of Montana’s Experimental Program to Stimulate Competitive Research (EPSCoR), a NASA-funded program designed to establish partnerships with government, higher education and industry to create lasting improvements in Montana’s research infrastructure, R&D capacity and national R&D competitiveness.

SOCIOMETRY AND ANTHROPOLOGY

Assistant professor Kaylin Greene joined the faculty of the Department of Sociology and Anthropology in 2015. Greene’s research crosses traditional disciplinary boundaries to explore health behaviors, daily activities and well-being during adolescence and the transition to adulthood. An author of more than 10 peer-reviewed publications, her previous work has appeared in a variety of scholarly journals, including Addictive Behaviors, Journal of Youth and Adolescence and Children and Youth Services Review.

Informed by life course and ecological frameworks, Greene’s ongoing work highlights the risk and protective factors associated with substance use, substance use-related harms and risky sexual behaviors among young people. Greene is currently collecting data for a project examining alcohol use, and driving after drinking, among young adults in rural Montana. With seed funding from the Center for Health Equity in Rural Montana, this project uses mixed methodologies (i.e., focus group discussions and surveys) in order to uncover the reasons that young people drive after drinking alcohol, and the characteristics of rural environments that facilitate or protect against this behavior. The long-term goal of this project is to advance science and build applied knowledge that can be leveraged to improve the health-related behaviors of young adults in Montana.

Greene received her Ph.D. in human development and family studies, as well and demography, from the Pennsylvania State University in 2013.
WHAT IT TAKES: THE CAMPAIGN FOR MONTANA STATE UNIVERSITY

This fall, MSU launched What It Takes: The Campaign for Montana State University. This is the university’s first comprehensive fundraising campaign with a goal of raising $300 million in private philanthropic support for the people, places and programs that are at the heart of MSU.

Here in the College of Letters and Science, we are committed to world-class teaching and research, and will proudly participate in the What It Takes campaign by rolling out several initiatives, beginning with our Western Lands and Peoples Initiative.

WESTERN LANDS AND PEOPLES INITIATIVE

In 2015, the College of Letters and Science launched the Western Lands and Peoples Initiative, a series of programs, projects and events highlighting interdisciplinary research within the college that is focused on the places and peoples of the Western United States and Canada. The college draws upon an extensive base of scholarship in research areas such as the history, literature and culture of the West; ecological studies of issues affecting the wildlife and fisheries of the region; and studies on the West’s geography, geology and resources. In coming years, we plan to build upon this impressive and established base of knowledge, to develop and organize the college into an international center for scholarship and research as it pertains to the North American West.

Within the larger context of our Western Lands and Peoples Initiative, we have two exciting and unique fundraising priorities: Voices of the West and Wild Montana.

Voices of the West: Western Writer-in-Residence

The college is committed to supporting writers whose voices tell authentic stories of the past, present and future of the American West. Voices of the West will allow the college to attract a distinguished author, who is from the Western region or who writes on the subject of the American West, to MSU on a visiting basis for a period of one to three years to serve as the Western Writer-in-Residence. This position, which is housed in the Department of English, will raise MSU’s profile in the field of creative writing and as a research and educational hub in the study of the region.

The college is very proud of the fact that we were able to bring award-winning author Rick Bass to MSU as the first Western Writer-in-Residence. Bass is the author of four novels, five collections of short stories and 16 books of nonfiction. He is the winner of dozens of awards and prizes, including O. Henry Awards and Pushcart Prizes, and he has received Notable Book of the Year honors from the Los Angeles Times and the New York Times, as well as Best Book of the Year from the New York Times.

Since coming to MSU, Bass has participated in a community-wide reading and discussion about writing in and about the West, and is putting the final touches on his latest book which is expected to be published next spring. He is currently teaching a creative writing course through the Department of English, and MSU students are directly benefitting from his expertise.

With your support of Voices of the West, we can make the Western Writer-in-Residence a permanent position at MSU and continue to mentor the writers of tomorrow.

Wild Montana: Preserving Montana’s Ecological Heritage

MSU’s location in the heart of the Northern Rockies and its proximity to Yellowstone National Park make it the ideal home for studying the wildlife, fisheries, habitats, geography and geology of the American West. Our faculty and students engage in world-class research, creating a hub of expertise that links fundamental ecology with wildlife and fisheries conservation and management.

Support for Wild Montana will:

• Enable students and faculty to discover innovative solutions to address increases in wildlife diseases due to evolving ecosystems.
• Empower MSU to continue training the next generation of fisheries, game and natural resource managers to address changing ecological systems.
• Expand opportunities for undergraduate and graduate student research experiences in order to advance our understanding of the interactions between living organisms and their environments.

Your support of the College of Letters and Science plays an integral role in our success. Thank you. To make a gift to the College of Letters and Science, please visit msuaf.org/give-CLS. For more information about giving or the initiatives outlined above, please contact Kelly Meredith, Director of Development, at 406-994-2092 or kelly.meredith@msuaf.org.
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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