

# tterra

DISCOVERY | CREATIVITY | INNOVATION • Fall 2016




## LESSONS IN RESILIENCE

Students find strength in global connections

**Oregon State**  
UNIVERSITY





Queen Anne's lace, common in Oregon and across much of the country, is thought to have originated in southwest Asia. See "Our Floral Commons," Page 16.  
(Photo: Nick Houtman)





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Oregon State is Oregon's leading public research university with more than \$336 million in research funding in FY2016. Classified by the Carnegie Foundation for the Advancement of Teaching in its top category (highest research activity), OSU is one of only two American universities to hold the Land-, Sea-, Sun- and Space-Grant designations. OSU comprises 11 academic colleges with strengths in Earth systems, health, entrepreneurship and the arts and sciences.

*Terra* is published by University Relations and Marketing. It is printed by a Forest Stewardship Council-certified printer with vegetable-based inks on paper with 55% recycled content (30% post-consumer).

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**On the cover**

TERREWODE, a social justice organization in Uganda, counsels women, such as Akello Loy, about the risks and treatment of fistula. Loy, the mother of four children, lives in Ogweto Village in the Amuria district of Uganda. She suffered paralysis and a fistula while giving birth to her fourth child. Oregon State students and faculty are working with TERREWODE to learn from and to empower women like Loy. (Photo: Joni Kabana)

## Innovation with Heart

One of the perks of interviewing researchers for *Terra* is the chance to get a front-row seat on the occasional surprise. Last summer, when I walked into engineering professor Kendra Sharp's office, her computer screen displayed a rash of red pins across a worldwide Google map. Each pin marked the location of a person who had contacted her about software that she had developed to analyze the potential for small-scale electrical power generation in rivers.

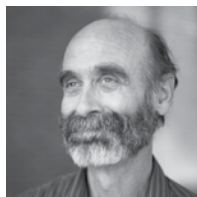
Local hydropower isn't the kind of thing to go viral on Facebook or Twitter. These queries were prompted by an Oregon State University news release, which had been publicized by news media in India, China, Europe and Mexico as well as Canada and the United States. The response wasn't all that surprising to Sharp who participates in the International Development Innovation Network, a movement to bring scientists and engineers together with community organizers. She and her colleagues apply technology to solve problems in health care, agriculture, energy and other fields.

At Oregon State, Sharp also leads the growing humanitarian engineering program, which provides students the chance to apply technical skill to human need. In the process, they gain invaluable insight into what it takes to make meaningful change. Technology is a powerful force for social good, but realizing that goal takes a willingness to listen and learn from the people whose lives are at stake. I think of it as innovation with heart.

The impact could go well beyond specific projects, such as Oregon State's work with Ugandan women suffering from obstetric fistula as described in "Lessons in Resilience" in this issue of *Terra*. A 2014 Princeton University study found that scientists and engineers are generally seen by Americans as smart and competent but not particularly warm or caring. That could lead, the researchers said, to a willingness among people to distrust or even to resent experts who offer science-based information, new technologies or innovative approaches to problems.

When I talk to students about their work, I frequently hear them express a strong desire to solve problems and make the world a better place. They know that technical skill is essential but not enough. Understanding and sharing through language, history, art and other disciplines are also necessary.

In every college at Oregon State, students are working with nonprofits, government agencies and businesses across Oregon and the world. Sharp's efforts are just one example of the opportunities that give OSU students deep experience at the outset of their careers.



*Nick Houtman*

Editor

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# Fearless Faculty

Hats off to Oregon State researchers for another record year

BY CYNTHIA SAGERS, VICE PRESIDENT FOR RESEARCH



It seems only moments ago that I assumed my post as the vice president for research at Oregon State University. The last year has been a time of onboarding and acclimating to OSU. I had the opportunity to learn much about the university's research enterprise and to be inspired by the work that takes place here every day.

There is an evolving story here at

Oregon State — nestled in this national treasure of the Willamette Valley between the grandeur of the Pacific and the majesty of the Cascades. OSU draws strength from this place, its productive farms, can-do ethic and practical, get-it-done culture. The OSU faculty, the people at the heart of this story, garnered \$762 million in economic and societal impact last year, according to a 2015 assessment by the consulting firm ECONorthwest.

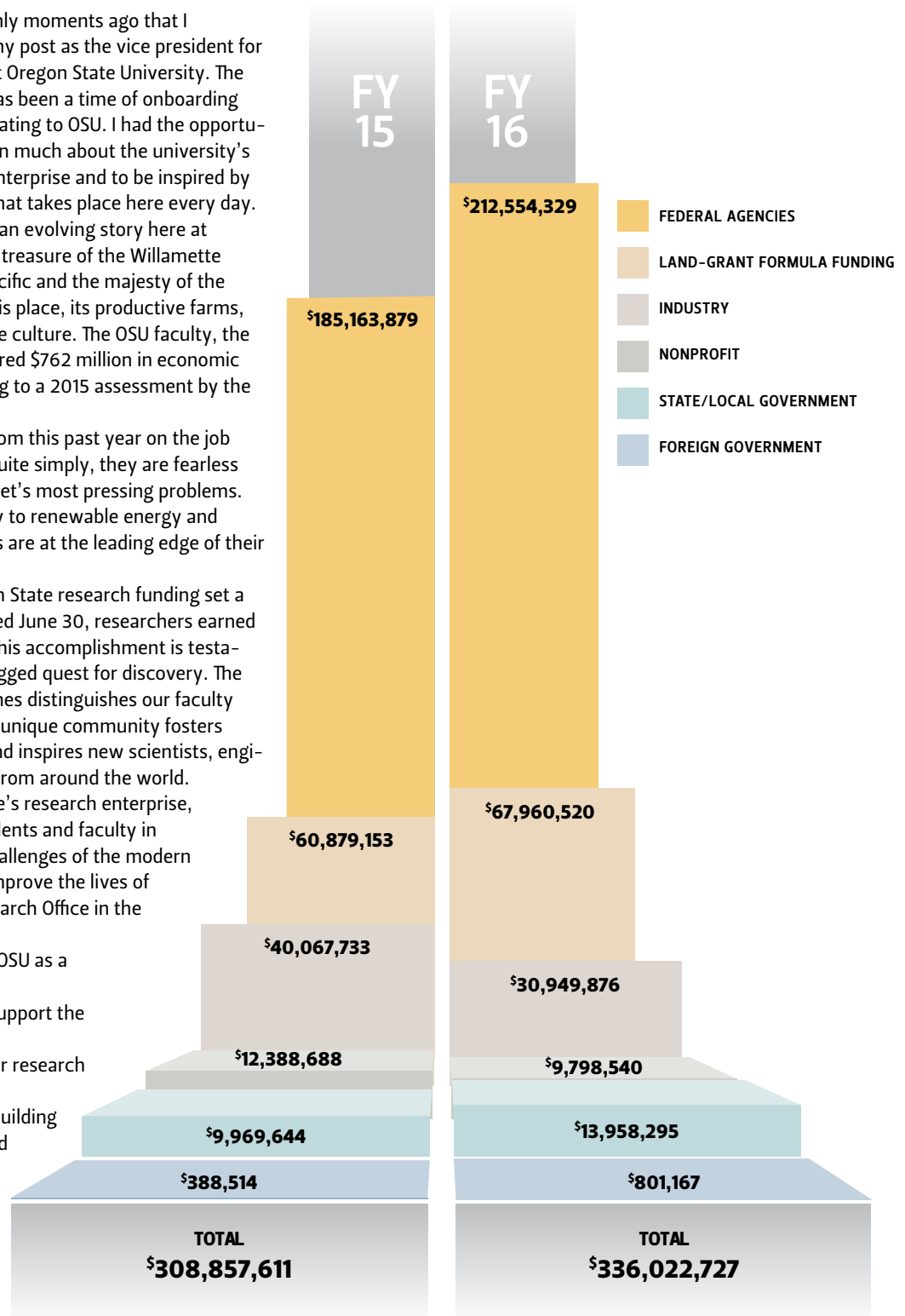
My first and strongest impression from this past year on the job centers on our Oregon State faculty. Quite simply, they are fearless — fearless in tackling some of our planet's most pressing problems. From climate change and food security to renewable energy and earthquake resilience, OSU researchers are at the leading edge of their respective fields.

For the second straight year, Oregon State research funding set a new record. In the fiscal year that ended June 30, researchers earned \$336 million in grants and contracts. This accomplishment is testament to our faculty's expertise and dogged quest for discovery. The culture of collaboration across disciplines distinguishes our faculty and contributes to OSU's success. This unique community fosters discovery, creativity and innovation and inspires new scientists, engineers and teachers who come to OSU from around the world.

As the chief steward of Oregon State's research enterprise, I am committed to supporting our students and faculty in their drive to better understand the challenges of the modern world and to use their knowledge to improve the lives of all. These are my priorities for the Research Office in the coming year:

- » Raise the international profile of OSU as a research institution
- » Generate additional revenue to support the research enterprise
- » Advance a climate of inclusion for research programs at OSU
- » Support emerging programs by building closer ties to federal agencies and national laboratories

The challenge for Oregon State is to do even better. I am committed to finding the resources and the support our faculty needs to continue their exceptional pursuit of knowledge.





# *E Pluribus Unum?*

Democratic ideals demand a different vision

BY JOSÉ-ANTONIO OROSCO, ASSOCIATE PROFESSOR IN THE SCHOOL OF HISTORY, PHILOSOPHY, AND RELIGION



In 1908, a Broadway premiere changed the way Americans understood what it means to belong to this country. At the time, the United States was experiencing one of the biggest waves of immigration in its history. In language that mirrors today's campaign slogans, nativists raged that immigrants were criminals, illiterates, carriers of disease, and that their cultural traditions were not compatible with the American way of life.

The play, *The Melting Pot*, provided the nation with a metaphor for imagining how diverse people from all around the world could transform into American citizens. *The Melting Pot* told the story of David and Vera, two children of immigrant parents who fall in love. Their families were at odds in their home country, separated by fear and prejudice. But instead of being a tale of star-crossed lovers, the play revels in the fact that here, the couple can forge a new relationship that is not weighed down by religious intolerance. In the U.S., the baggage of the Old World disappears, and a new race of liberty- and equality-loving people can be born.

The metaphor of the melting pot captured the imaginations of millions — and it still does. In a poll conducted in 2010, a majority of Americans agreed that the melting pot is the ideal way to think of the requirements of immigration: Immigrants who want to live in the United States ought to give up certain parts of their cultural identity.

But starting in the 1920s, a group of American philosophers, including Horace Kallen, John Dewey, W.E.B Du Bois, and Jane Addams started to question this ideal. Was it ethical to expect immigrants

to shed their culture and traditions to assimilate into the United States? Was it compatible with the democratic ideals of the nation to force newcomers to alter their ways of life and abandon their heritage? Their answers were “no” to both of these questions. Instead, they attempted to topple the melting pot and to envision a democratic society that welcomed immigrants for the unique contributions they might make to our social and political life.

The alternative they sketched out was based on different principles. First, immigrants and other minority cultures should have the right to maintain their traditions, languages and practices. Second, we should learn not just to tolerate differences, but to be open to and affirming of them. Finally, we ought to think about how to establish spaces for ongoing dialogue in our communities on how our traditions and policies affect different communities, so that we can avoid harm and misunderstanding.

These ideals, the philosophers argued, were truer to our founding values and strengthened American democracy. Several of these ideals later found their way into social movements, including labor organizing and Cesar Chavez's effort to unionize farmworkers. Yet the struggle continues to imagine what role immigrants should play in building a culturally pluralistic democracy.

*Editor's note: José-Antonio Orosco's new book, Toppling the Melting Pot: Immigration and Multiculturalism in American Pragmatism, is due to be published in October 2016 by Indiana University Press.*

Photo: Hannah O'Leary







# A Market for Barnacles

Undergraduate researcher launches study of barnacle biology and culture

BY NICK HOUTMAN

In Spain, a plate of gooseneck barnacles will set you back more than the cost of a lobster dinner. Known as *percebes*, goosenecks “set the palate in ecstasy,” a Barcelona chef recently told a reporter. Nevertheless, Julia Bingham winced a little last spring when asked if she had ever tried the tube-shaped delicacies while she was studying them as an undergraduate at Oregon State University.

“I get that question a lot, and it kills me to say ‘no,’” says Bingham, who had gingerly navigated the wave-tossed shore of Cape Perpetua to collect barnacle samples for her Honors College thesis. “It’s supposed to be sweeter than crab or lobster and taste like the ocean.”

In Spain and other parts of the world, that reputation has been the barnacles’ downfall. Harvesters go to extremes to scrape the crustaceans from the rocks. Populations of *Pollicipes pollicipes* collapsed as prices reached as high as \$50 per pound.

During a summer 2015 field course at Oregon State’s Hatfield Marine Science Center in Newport, Bingham learned about the gooseneck problem. She also discovered that a similar species, *Pollicipes polymerus*, grows abundantly on the West Coast. She wondered if this animal could pose an opportunity for fishermen. And if so, how could Oregon avoid overharvesting local populations?

Last winter and spring, as a student in assistant professor Mark Novak’s marine

ecology lab, Bingham launched the first systematic evaluation of gooseneck barnacle biology in Oregon. She “chased the low tide,” she says, meaning that she sometimes got up in the middle of the night to arrive at her Cape Perpetua field site before dawn when the tides were out far enough for her to safely do her research.

Over the summer, she expanded on her results with support from Oregon Sea Grant. In a collaboration with University of Oregon professor Alan Shanks and with Tom Calvanese, director of Oregon State’s Port Orford Field Station, she surveyed populations on jetties — rock walls built to enhance navigation — where commercial harvesting would likely start. She also tested methods to encourage goosenecks to reproduce and grow.

“The barnacles need specific conditions to colonize and settle,” Bingham says. “As they settle and develop as juveniles into adults, there’s a lot of mortality along the way. It takes a long time for them to reach harvestable size.”

As part of the project, Calvanese and Port Orford Sustainable Seafood, an organization that supports local fishers, began exploring the possibility of developing a West Coast market for goosenecks. By encouraging collaboration between scientists, fishers and the public, Bingham and her team aim to foster a sustainable approach to management.

Shelby Walker, Oregon Sea Grant director, says she was deeply impressed by Bingham’s persistence and enthusiasm. “This is exactly the type of work that Sea Grant strives to support, a project that truly integrates research and community engagement,” she says.

In Spain and Portugal, scientists and fishers have worked to restore gooseneck populations without closing the fishery. Oregon has a chance to learn from that experience and get ahead of a new opportunity before problems arise, says Bingham.

It may be well worth the wait, she adds. “I finally tried the barnacles. Members of our research team boiled up some goosenecks from the rocks at one of our field sites. I can confirm that they are sweeter than crab with a distinctly salty ocean taste.”

In 2015, her work earned a “best undergraduate paper” award at a meeting of the Western Society for Naturalists in California.



Julia Bingham. (Photo: Nick Houtman).

Below left: A gooseneck barnacle projects its stalk. (Photo courtesy of Oregon State Parks). Right: Low tide gave Julia Bingham the chance to measure

goosenecks at her Yachats study site. (Photo courtesy of Julia Bingham).



# Lessons in Resilience

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In Africa, students learn how fistula survivors turn tragedy into hope

By Nick Houtman | Photos by Joni Kabana



Gentle support comes through dance for a fistula survivor and advocate in Soroti, Uganda.



When three Oregon State students signed up for a project in the university's new humanitarian engineering program, the first question was, Have any of you made soap? Nervous laughter broke out when each one said "no."

"Ok, this will be fun," Brianna Goodwin recalls thinking.

But a year and hundreds of bars of goat-milk soap later, Goodwin, one of the students and a mechanical engineering graduate from Seattle, and her teammates — Grace Burleson of Beaverton and Brian Butcher of Portola Valley, California — took their expertise and curiosity to Africa. They learned how the act of making this simple product can smooth the way for social justice and empowerment.

Under the guidance of professor Kendra Sharp, the Richard and Gretchen Evans Professor of Humanitarian Engineering (see "Humanitarian Engineering Grows at Oregon State," Page 9), the students completed their capstone project for their degrees by working with a nonprofit organization, TERREWODE in Uganda. Last summer, they travelled to the East African country to conduct additional field research on a soap-making operation.

As engineers, they focus on process, technology and cultural communication. But their efforts are part of a larger relationship between Oregon State and TERREWODE. In 2011, Bonnie Ruder, a midwife from Eugene and now an Oregon State Ph.D. student in medical anthropology, met Alice Emasu, the group's founder. Ruder traveled to Uganda that fall, and others followed: Lauren Caruso (then Lauren Baur) in public health in 2012 and students in the College of Business in 2015 and 2016.

### Extended Labor

Based in Soroti, Uganda, TERREWODE aims to improve the lives of women suffering from a medical condition known as obstetric fistula. This devastating problem occurs when, during prolonged childbirth and without adequate medical care, tissue in the birth canal is damaged. The resulting fistula, or hole, allows urine or feces to leak uncontrollably. Victims may be shunned by family members and reduced to a life of poverty and isolation.

Globally, the World Health Organization estimates that more than 2 million women live with untreated obstetric fistula, most of them in Asia and sub-Saharan Africa. Fortunately, effective medical treatment is available.

With support from the Worldwide Fistula Fund, TERREWODE educates women about the risks and

raises money for medical care, which is often out of reach in rural areas. In the course of several trips to Uganda, Ruder interviewed health-care providers, fistula survivors and representatives of the Uganda Ministry of Health. In 2014, she created the nonprofit Uganda Fistula Fund for TERREWODE to raise money for a new fistula hospital in Soroti.

For her Ph.D. in medical anthropology, Ruder is delving into more complex and persistent problems in fistula treatment — residual incontinence after surgery. "There are estimates that between 7 to 60 percent of women suffer from ongoing urinary incontinence even after a successful fistula repair, but the problem has not been well studied," she says.

While grants and donations can help women rebuild their lives, Ruder and TERREWODE aim to establish a source of income for the women that is sustainable. "Women who have suffered from fistula need meaningful, locally appropriate work that can lift them out of the circumstances they have endured," she says.

Through their work with TERREWODE, Oregon State students are learning firsthand about the strength and determination it takes to recover from such a life-changing medical condition. In return, they are working side-by-side with fistula survivors to prevent other women from suffering the same fate. They strive to improve health-care access, to understand women's needs and to create sustainable, locally based businesses.

### Market Access

When they visited Uganda in 2015 and 2016, students and faculty in the OSU College of Business aimed to learn more about TERREWODE and contribute to its success. They met with survivors and with Emasu and her colleagues and asked them what would be most useful in assisting the Ugandan women's endeavors to become financially independent.

"This year, we've focused on other markets for their handcrafts," says Lauren Caruso, outreach and civic engagement coordinator for the college. "We worked with them to design beadwork for an American market, and we're developing an online retail presence." That website, [terrewodemarket.com](http://terrewodemarket.com), offers an opportunity to purchase a variety of products made by fistula survivors.

With the help of generous gifts from alumni, the College of Business has provided support through a student group, 16xOSU, a social-venture club that provides startup funds for student-led businesses. In an academic program known as Innovation Nation,



Saanen goats from Ireland provide milk for soap makers in Uganda.

first-year students create their own businesses and contribute the profits to a shared fund that is managed by the student community to benefit humanitarian organizations like TERREWODE.

That approach to social entrepreneurship resonated with Taryn Lowes, a business student from the Douglas County town of Yoncalla. She traveled to Uganda and was inspired by the positive energy shown by many of the women she talked to. “A lot of them have gone through so much — their heart-breaking stories, their past. But they are so happy and excited, they didn’t let it get them down. They are working with TERREWODE and getting their lives back on track.”

As students, Lowes and her peers had started their own businesses and contributed funds to the microloan program. On her own initiative, Lowes continued to run her home-cleaning business and raised enough money to pay her way to Uganda.



### Trip to Soroti

Last June, after a 48-hour trip from Seattle via Dubai, the three OSU engineering students — Goodwin, Bursleson and Butcher — arrived at Entebbe, Uganda’s largest airport, where they were met by a TERREWODE representative. The road trip to Kampala, the capital, had its anxious moments as drivers “like playing ‘chicken,’” Goodwin wrote in her blog. “There are cars, people, and bota botas (motorcycle taxis) on the road, all trying to get to different places as fast as possible.”

The students had come to Uganda to learn more about what it would take for TERREWODE to help fistula survivors launch a goat-milk soap business. The initiative had begun a year or so before, when Oregon photographer Joni Kabana visited Uganda. She devotes part of her creative work to humanitarian organizations such as Oregon-based Mercy Corps and had come to Uganda to take photos for TERREWODE. In her luggage, she had brought a gift of soap made by a friend in Spray, Oregon. Alice Emasu, the director, wondered if





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Obstetric fistula...occurs when, during prolonged childbirth and without adequate medical care, tissue in the birth canal is damaged.

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local women could also make the soap as a commercial product.

One problem that had to be overcome was a source of milk. Goats in Uganda are typically raised for their meat and do not produce much milk, so Emasu worked with Heifer International to bring Saanen goats from Ireland and to instruct fistula survivors in taking care of them.

### Making Soap

The students had three objectives for their stay in Africa: identify a practical, local source of electricity so soap makers wouldn't have to worry about periodic interruptions to Uganda's power grid; find ways to improve efficiency and scale-up the soap-making process; determine if enough locally available ingredients were available to increase soap production.

"The more the soap is made by the women with local ingredients, the more sellable it will be as a humanitarian product," says Burleson.

The previous year, back in Corvallis, as they first pondered their task, the students assumed they would need to create a device to make soap. "We didn't understand at first how the cultural context would affect our design process, but it's relevant with anything you're designing," Goodwin says. "We had to understand who we're designing for. The cultural context is huge.

You can't just bring something from America and expect them to use it."

To put themselves into the shoes of soap makers in Uganda, the students decided they had to make goat-milk soap. They interviewed Ruder and got instructions from Kabana and her colleague Dardi Troen, soap-making trainer during a pilot project in Uganda and now the packaging and branding coordinator. The students bought goat milk and fragrances at the local food co-op and other supplies online — shea butter (made from nuts produced by the African shea tree), sunflower oil, lye.

One cold November night, outside Butcher's garage, they hunched over two small cook stoves, the kinds commonly used in households in developing countries, and set to work mixing and heating the ingredients. In the light of their headlamps, they watched for the liquid to reach a critical stage at which it gains a consistency like whipped cream. The frothy liquid could then be poured into molds and aged for about two months, but the students wanted to speed things up. By keeping the soap mixture at a constant temperature of 155 degrees Fahrenheit for two hours, they could cut the aging process to one day.

"We sat outside for about three hours collecting temperature data to decide if it would work," Burleson says. "But in the end, we decided that was impossible."



### Humanitarian Engineering Grows at Oregon State

"The most educated person in the room," says Kendra Sharp, "is not necessarily the one with the most relevant knowledge for that problem." So Sharp, the Richard and Gretchen Evans Professor in Humanitarian Engineering, nurtures a culture of engagement in students.

Communications, she says, is key. She works with colleagues in public health, economics, anthropology, public policy, engineering and education to provide students with experiences that help them understand other points of view.

When it comes to solving problems, "that means appreciating diversity, understanding that your point of view is not the only point of view, relating to people who are different," she adds.

With more than \$1.5 million in support from Oregon State donors, the Humanitarian Engineering program has awarded Evans Family Fellowships to 14 graduate students to conduct field research or otherwise support humanitarian engineering-related projects at OSU.

Students are delving into cook-stove design in Guatemala, earthquake engineering in Nepal, science education in Uganda and renewable energy systems in Alaska.

See [humanitarian.engineering.oregonstate.edu](http://humanitarian.engineering.oregonstate.edu).

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TERREWODE staff provided support to this woman struggling with obstructed labor at a health post near Soroti.

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The students had three objectives for their stay in Africa: identify a practical, local source of electricity; find ways to improve efficiency and scale-up the soap-making process; determine if locally available ingredients can be used for increased soap production.

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In subsequent trials, they refined their approach, experimented with other mixing methods and even hooked up a mixer to a solar-charged battery. Solar panels are available in Uganda, they reasoned, and might provide the solution for a sustainable source of power.

The students produced a lot of soap. While only some of it was useable, they chalked up the rest to experience. But more importantly, they understood what it might take to produce a product with commercial potential.

### Learning on the Ground

As they learned how TERREWODE operates and what it takes for a new business in rural Uganda to succeed, the Oregon State business and engineering students fulfilled their own educational goals. Each student is committed to making a positive difference in the world. Working with TERREWODE “allows me to do what I love but have an impact on peoples’ lives,” says Goodwin.

Burleson lived in Egypt for five years and studied drinking water treatment in Uganda for her undergraduate thesis in mechanical engineering. She worked briefly with TERREWODE in 2015 during an internship with an Oregon-based nonprofit, MAPLE Microdevelopment of Eugene, which was co-founded by

Ron Severson, an instructor at the University of Oregon. She entered Oregon State’s mechanical engineering master’s program this fall with a humanitarian emphasis.

Before attending Oregon State, Butcher traveled to Bolivia and Chile where he volunteered for community organizations. Last summer, after he returned from Uganda, the mechanical engineering graduate interned with the firm CH2M.

Goodwin aims to combine engineering with biology. She wants to develop biomechanical systems that can assist people with practical, everyday tasks and is starting her master’s at the University of Washington this fall.

“Our program aims to inspire students to do work that they feel makes an impact on society,” says Kendra Sharp, a leader in developing Oregon State’s humanitarian engineering program. “We stress the importance of learning collaboratively in community to solve real-world problems. This is a skill these students will take away no matter where their careers take them.”

Students also take away lasting memories of the people they met. “When you see TERREWODE interact with the fistula survivors, it’s pretty incredible,” says Caruso. “We would come to a village and pull up to a field under a tree, and there would be this group of people who would start singing and dancing when we arrive.” (See back cover.)

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Goat-milk soap making supplies include (from top) shea butter, sunflower oil, goat milk, water and lye.





When Taryn Lowes returned to Uganda last summer, a friend she had met the previous year traveled an hour by bota bota to greet her. “Seeing everyone’s smiling faces and embracing them with hugs really let me know the impact of our partnership,” she adds. “I’ll never forget the people I’ve met and the friendships I’ve made.”

TERREWODE is in the process of seeking government certification as a soap-making business and has a commitment from one customer. Through MAPLE Microdevelopment, the Portland-based vacation home rental company Vacasa (vacasa.com) has agreed to buy 1,000 bars of goat-milk soap for distribution through its homes in Italy. **terra**

Working on their soap-making method, TERREWODE staff and fistula survivors are developing their business in partnership with OSU and MAPLE Microdevelopment of Eugene.

*Editor’s note: Students interested in doing an internship with TERREWODE can contact Bonnie Ruder, [bonnieruder@gmail.com](mailto:bonnieruder@gmail.com).*





# GRAND STRATEGY





# GLOBAL PURPOSE

**Historians explore breadth and impact  
of past U.S. leadership**

BY NICK HOUTMAN  
ILLUSTRATION BY SANTIAGO UCEDA

The United States has never been more connected to the global community than it is today. The federal government negotiates multilateral trade agreements, conducts military operations across borders, spies on friend and foe and enters into complex environmental pacts. As war and poverty drive people from their homes on practically every continent, politicians propose starkly different paths to a secure future.

These events may feel chaotic or, to those who remember recent history, simply reflective of the last half century. Either way, it's worth stepping back to take the long view. "I argue that World War I was the crucible for all this," says Christopher McKnight Nichols, Oregon State University historian. "The world had become so interconnected that the future of war and conflict was devastation. Everyone coming out of what they then saw as The Great War had grand strategies because they knew that the next war was going to be worse. Whoever it was; wherever they were. And that's only amplified today."

Last spring, Nichols hosted the Rethinking Grand Strategy Conference at Oregon State to bring together experts who are looking at evidence for the development of a broad vision to guide foreign relations, aka "grand strategies." Before the meeting, he sat down with *Terra* to discuss the lessons we can glean from this scholarship. Here are excerpts from that conversation. (For a longer version, see the *Terra* website, [terra.oregonstate.edu](http://terra.oregonstate.edu).)

*Terra: What is the origin of the term "grand strategy"?*

**Nichols:** In political science, "grand strategy" is language that comes from the Prussian general and theorist Carl Philipp Gottfried von Clausewitz and British military theorist Basil Liddell Hart. It refers to a long-term intellectual framework of the relationship between means and ends that, taken together, forms a big, capacious foreign policy worldview. Not small things.

One of the classic examples from the 20th century is containment, which was articulated by George Kennan (American diplomat and political scientist) as an intellectual foundation for the containment — that is, prevention of the spread — of Soviet communism. Its strength was that it was adaptable yet specific. Even so, Kennan later recanted some of the ways it was used and developed, particularly in terms of rejecting so-called proxy wars. But a grand strategy like containment is useful as a broad way of understanding relations between countries, setting objectives and defining diplomacy over time and under changing conditions.

*Terra: Does grand strategy have relevance beyond diplomacy and the military?*

**Nichols:** We'll explore that in the book coming out of this conference. What was the civil rights grand strategy? It wasn't just domestic. There was a global civil rights strategy. You can go back to W.E.B. Du Bois (African-American writer and co-founder of the National Association for the Advancement of Colored People) within the context of the global color line. The color line "belted the world," as Du Bois memorably argued; it was much bigger than just achieving equality at home. We'll also have a public health scholar from Yale who directs their grand-strategy program. What does a public health global grand strategy look like? For example, was the President's Emergency Plan for AIDS Relief (PEPFAR) — as begun under George W. Bush to combat global HIV/AIDS, tuberculosis and malaria — a grand strategy?



"In political science, 'grand strategy' is language that comes from the Prussian general and theorist Carl Philipp Gottfried von Clausewitz and British military theorist Basil Liddell Hart. It refers to a long-term intellectual framework of the relationship between means and ends that, taken together, forms a big, capacious foreign policy worldview. Not small things."





Christopher McKnight Nichols, Oregon State University historian (Photo: Jeff Basinger)

*Terra: Where are scholars going with this? Why does this matter?*

**Nichols:** The first grand strategists were only talking about war. In this scholarship, as well as in terms of training and military history, generally there is a three-part sequence: strategy, tactics and operations. The first wave of writing on grand strategy really emanated from political science and military analysis. Part of our motivation as historians is to do serious historical analysis from the 18th century to the present to, first, construct a new history, and, second, critique and recast ahistorical uses of the concept of grand strategy.

For example, some of the scholarship has argued that Harry Truman and Dean Acheson were poor grand strategists but that they had a grand strategy. My reading of that era (1940s, early 1950s) is that they were developing an ad hoc framework for the unfolding Cold War that was absolutely not a grand strategy, because it was inherently flexible and fluid at the moment.

The relevance of grand strategy made a major impact in the 1990s, which was when the Clinton administration did this initiative called the Kennan Sweepstakes. It was an

attempt to bring all these policy-makers together to come up with a name that would represent the Clinton Doctrine, nothing less than a new U.S. grand strategy for the post-Cold War world. The process was incredibly successful in that it helped the Clinton administration to develop a guiding doctrine. It was incredibly unsuccessful in the naming process. The term became “democratic enlargement.”

By that was meant a political philosophy of the U.S.’s proper role in the world being to help promote globalization, global interdependence and U.S.-led free trade economics. It wasn’t about hard power use at all. This term and this moment in the 1990s, then, is a great way to understand the rise and search for grand strategy. It’s actually something that policy-makers think a lot about. It’s about their legacy.

There’s a rhetorical element at work here too, about how to refine those core principles down to a clear idea that we can trot out to a broader public to show why something like a humanitarian intervention in a place like Rwanda mattered. “Democratic enlargement” didn’t help with that and Bill Clinton often remarks that

his biggest policy regret of his presidency was not intervening to stop the genocide in Rwanda. The rhetoric of democratic enlargement via economics did help with getting more McDonald’s into China, that is, more trade overall, and pushing back a little bit on human rights, but only a little post Tiananmen through the 1990s.

*Terra: How do today’s populist movements on the right and left affect the development of a modern grand strategy?*

**Nichols:** The history of foreign relations generally is the history of elites. They are the people who are most often in power and often the most cosmopolitan in their thinking about cross-border relations. One thing that is disheartening to me is that, according to most polls, Americans today are so poorly versed on the world, from geographies to languages to the presidents of countries with whom we’re allied. It should be no surprise that foreign relations still remains a bastion of elites, especially for Americans. Poll after poll concludes that Americans don’t care much about it.

One of the things that somebody like Donald Trump is actually pretty good at doing is articulating a robust, straightforward foreign policy view. Not one that all people are getting behind, but I think there is a core of consistency to it. It’s a protectionist, punitive, unilateral, isolationist position that is really appealing to many people. Still, it reflects a vague, reactionary populism, rather than a more thorough grand strategy along the lines of Cold War containment or doctrines articulated by presidents Monroe, Wilson and Truman.

My sense is that we see similar patterns on the American political left, too, related to a less interventionist and less hubristic U.S. presence in the world in the wake of the Iraq War and now 15 years after 9/11.

**terra**





# Our Floral Commons

Scientists and amateur botanists join forces in the Oregon Flora Project

PHOTOS AND STORY BY NICK HOUTMAN





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irsten Hill cares for the plants on her 25-acre Cascades foothills farm with the knowledge and sensitivity that most of us reserve for our closest friends. She nurtures skullcap, borage, calendula and other herbs and yanks out Timothy grass by the handful. In her Douglas-fir woodlot, she fells trees to carve out openings for ocean spray, huckleberry and blackberry. She watches over marshmallow, California poppies, hyssop, stinging nettle and sorrel that survive nestled in a field under towering stalks of Queen Anne's lace (aka wild carrot), grasses and thistle.

Every species has a role to play and a story to tell, and like a teacher with her students, Hill wants each one to fill its niche. "Take thistle, for example. It's nasty for a reason," she says. "It's a massive toxin-removal plant. Its main job is to restore damaged systems. With its thorns, it's telling you to leave this place alone. It goes in there with its tap root, breaks the soil up and brings up minerals from deep below."

In 2013, when Hill bought the farm ("My family has always enjoyed that saying," she laughs), she wanted to learn more about the plants that had become what she views as her co-conspirators in restoring the land. So she reached out to the state's top-seeded source of botanical knowledge, the Oregon Flora Project at Oregon State University. This two-decades-long effort to monitor and catalog botanical biodiversity has produced — in print and online — an unparalleled resource for people who manage farms, ranches, forests, roadways, public green spaces and other lands. Key to this accomplishment is a network of more than 1,000 volunteers like Hill, people with a passion and curiosity about the natural world.

Twice a month, Hill makes the one-hour drive from Holley down the valley of the Calapooia and across the Willamette to Corvallis. She hunkers in the OSU herbarium, the state's largest collection of dried specimens of plants found within its borders (see sidebar, Page 21), and pulls out volumes of plants meticulously arranged and annotated like books in a library. Under the supervision of Stephen Myers, Oregon Flora Project taxonomic director, she uses plant samples submitted by other volunteers, whether they be weekend hikers or professional scientists, to confirm or edit the plant identification keys created for the project. Rarely, after she has exhaustively evaluated the color, shape and structure of petals, stems, seeds and other plant parts, she may suggest reassigning the identification of a specimen.

"I literally go character by character," she says. "Plants are like people. You can bunch them together, but you may not want to say they're all the same."

Along the way, she is gaining insight into her land in Holley. "I read about these plants and go, 'Wait, I've got that one. Where did I see it?' I start looking around at home," she says, "and when I see it, I say 'That's you; I know you now.' It's helping me get on a higher level and learn about my property."

*Tsuga heterophylla*



*Taxus brevifolia*

## Keys to the Planet

In fact, says Linda Hardison, director of the flora project and an assistant professor in the Oregon State Department of Botany and Plant Pathology, knowing what plants are in our midst is key to understanding the environment. “Everything on this planet hinges around plants,” she says. “They make the air we breathe. They are the primary sources of food, from phytoplankton to grasses for cattle. Plants are the lynchpin for the whole planet.”

For people charged with managing a landscape, she adds, not knowing what plants are present would be like making dinner in the dark. “You can fumble around and try things, but without knowing what’s there, you can’t appreciate what options you have.”

The flora project’s roots go back to 1994 when Scott Sundberg acutely felt the need for an accurate, accounting of Oregon’s floral landscape. The Eugene native and graduate of the University of Oregon had just been hired at Oregon State to oversee the integration of herbarium collections from both institutions. By then, the last published assessment of Oregon’s plant diversity was more than 30 years old. He founded the Oregon Flora Project to create an up-to-date resource. He sought advice and contributions from fellow scientists and the public.

“Scott developed a lot of personal relationships to get this program going because he had deep respect for the knowledge that amateur plant enthusiasts possessed,” says Hardison, who was married to Sundberg. “Good examples are the partnership he formed with the Native Plant Society of Oregon and the decade-long exchange of information with Douglas County amateur botanists. Four ladies who met at the Glide Wildflower Show got together and botanized most of Douglas County.” They exchanged plant lists with Sundberg and painstakingly confirmed identifications. Their annotated samples were housed in the county museum. Others became part of the herbarium at Oregon State.

Plant by plant, county by county, Sundberg worked with citizens and professional botanists, such as OSU’s Ken Chambers. Sundberg created a database to organize the hundreds of thousands of plant samples that are glued to sheets of stiff, acid-free paper and stored in cabinets in the OSU herbarium.


One of his goals was to put the complete collection online, where it would be widely available to anyone with an internet connection. With financial support from the National Science Foundation and the federal Bureau of Land Management, Sundberg and a small team of experts developed interactive maps and other digital resources that enable citizens to visualize where and what kinds of plants occupy every nook and cranny of the state (see [oregonflora.org](http://oregonflora.org)).

“Scott was 6 feet, 5 inches, over 200 pounds; he was a big guy, and he loved little duckweeds,” says Hardison. “There he is, this behemoth of a man crawling around in the pond scum, and he’d be so excited. He had a sharp eye for recognizing all the plants in an area, but he really enjoyed discovering the little things.”



*Fritillaria affinis*





Sundberg's efforts were cut short when, in 1999, he was diagnosed with multiple sclerosis. Having earned her Ph.D. in botany at the University of Washington, Hardison gradually assumed responsibility for the project and became its director after Sundberg's death in 2004.

### *Flora of Oregon, Volume 1*

In 2015, Hardison and her team reached a milestone. They published *Flora of Oregon, Volume 1*, part of the first comprehensive treatment of the state's floral communities in more than a half century. Dedicated to Sundberg, this celebration of Oregon's remarkable landscape reflects more than 340,000 observations of plants contributed by members of the Native Plant Society of Oregon, Oregon State scientists, government researchers and individuals. It describes plants from the rain forest of the north coast to the arid Columbia basin, from the Siskiyou in the southwest to the Owyhee Uplands in the east.

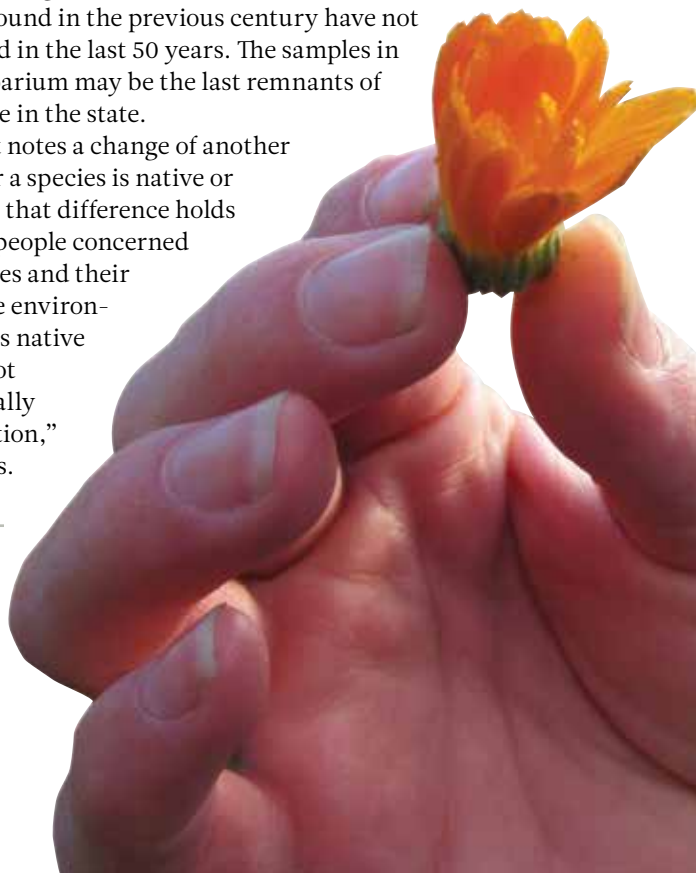
In addition to laying out grasses, sedges, lilies, ferns, conifers and other plants in exhaustive technical detail, the volume includes a history of botanists in Oregon, including pioneering Oregon State professor Helen M. Gilkey. Color photos highlight plant communities in the state's 11 major ecoregions. Hikers can use an annotated list of 50 mapped locations to explore Oregon's botanical heritage (see sidebar, Page 22).

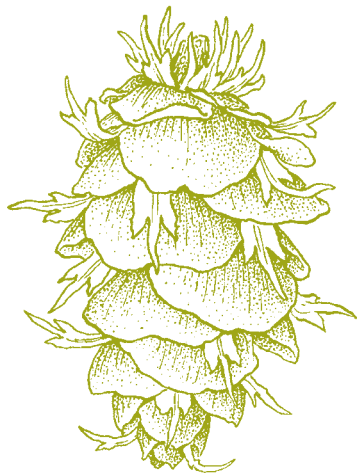
While *Flora of Oregon* comprises a snapshot in time, it also marks an ongoing transition. Its roughly 4,700 species, subspecies and varieties include about 15 percent more than were recorded in the 1961 assessment. Some have moved into the state from Nevada and California, possibly reflecting the influence of a warming climate. And, notes Hardison, another 159 found in the previous century have not been collected in the last 50 years. The samples in the OSU herbarium may be the last remnants of their presence in the state.

The project notes a change of another sort, whether a species is native or exotic. While that difference holds meaning for people concerned about invasives and their impact on the environment, "what's native and what's not becomes a really squishy question," Hardison says.

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Calendula is among the herbs Kirsten Hill cultivates in her garden.





*Pseudotsuga menziesii*  
var. *glauca*

“‘Native’ is an intersection of time and place. You have to consider native over what time period and in what place. You can talk about what’s native to North America, which will be different from what’s native to the Willamette Valley. Some exotic plants can become troublesome, weedy things,” she adds, “because they don’t have the checks and balances of indigenous pests or pathogens to keep populations in equilibrium.”

The Oregon Flora Project uses habitats and ecosystems as a frame of reference. “So when you look at where we are, whether it’s the Willamette Valley, the Columbia Basin or the high lava plains, what plants would you find in undisturbed habitats and plant communities? That can serve as an expression of what’s native,” says Hardison. “Making people aware of the frames of reference is an aha! moment. It’s technical information, but it’s really graspable.”

### Plants in Our Future

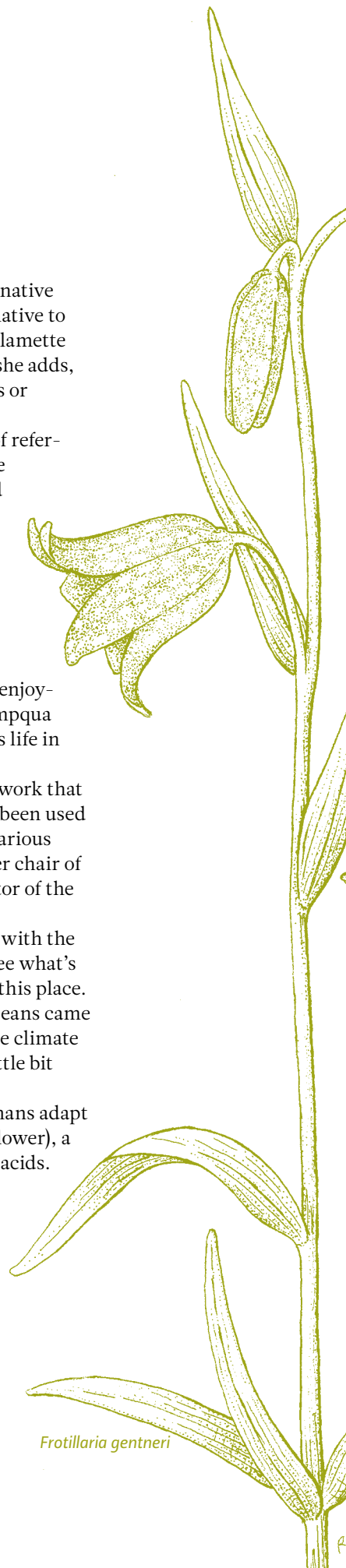
By providing an outlet for sharing personal interests, the project has inspired people. One woman wrote to Hardison to tell of her father’s enjoyment in finding new flowers on hikes at Crater Lake and along the Umpqua River. They were “the soul-feeding endeavor that gave meaning to his life in retirement,” she said.

For others, *Flora* has become a useful reference. “The background work that the project has done, and now the book that has been published, has been used by natural resource managers, master gardeners and especially the various native plant societies around the region,” says Russ Karow, the former chair of the Crop and Soil Science department at Oregon State and now director of the Agricultural Research Foundation.

For Kirsten Hill, the notion of what’s native on her farm intersects with the past and her own vision of a diverse, functioning ecosystem. “I can see what’s there now, but I can also see what was there before. I want to restore this place. I want to find a happy medium between what was there before Europeans came over and what we’ve done. We can’t restore to what it was because the climate is warming and plants are moving. I have a 50-year plan, and I’m a little bit bullheaded,” she says with a grin.

The herbs she is planting have another purpose: They can help humans adapt to the stresses of a changing planet. One example is borage (aka starflower), a Mediterranean native that provides dietary micronutrients and fatty acids. Some people have found it to be useful for handling stress. In Hill’s vegetable garden, borage has spread with abandon.

Knowledge of plants is critical to her hopes for the future. “If you don’t understand the environment around you, you’re vulnerable,” she says. “That’s our reason for being here, understanding who we are and how we fit.” **terra**



*Fritillaria gentneri*





The Oregon Flora Project has given Kirsten Hill a deeper understanding of the environment on her farm.

## More than Leaves of Grass

The OSU Herbarium provides a critical resource for scientists

Established in 1886, only about 20 years after the university's founding, the OSU Herbarium contains more than 450,000 specimens from Oregon and around the world.

A little more than a third, about 160,000, are included in the database of Oregon vascular plants (vascular refers to the "plumbing system" that most land plants use to transport water). In addition, the herbarium provides a repository for fungi, algae and non-vascular plants such as mosses and liverworts.

Located in Cordley Hall on the Corvallis campus, Oregon State's collection comprises the largest portion of the herbarium. Plant specimens originally housed at Willamette University and the University of Oregon are also archived with the OSU collection.

Through the Oregon Flora Project, about 90 percent of the Oregon specimens have been reviewed and annotated with up-to-date plant classifications.

See more at [oregonstate.edu/dept/botany/herbarium/](http://oregonstate.edu/dept/botany/herbarium/).



# HIKES FOR PLANT HUGGERS

## 11 places to see Oregon's stunning floral diversity

Adapted from "Exploring Oregon's Botanical Diversity," *Flora of Oregon, Volume 1*, Page 51, by Edward R. Alverson

Oregon is blessed with an extensive network of lands designated to promote the conservation, research and exploration of our native flora and fauna. The sites briefly summarized here in each of the state's 11 ecoregions provide good examples of native habitats and plant communities, support a diverse native flora, host endemic or rare species or have impressive wildflower displays. The best times of year to visit vary greatly, but native plants can be seen blooming somewhere in the state from February through October. Field trips led by the Native Plant Society of Oregon and other conservation organizations are also an excellent way to learn more about Oregon's flora.

*Editor's note: The Sutton Creek summary below shows the full listing as it appears among the 50 locations described in Flora of Oregon. Subsequent listings have been shortened for space.*

### 1 Estuarine Coast Ecoregion

#### Sutton Creek, Lane County

Just north of Florence, Sutton Creek flows out of the Coast Range into Sutton Lake and then winds its way through the dunes to the Pacific Ocean. Much of the landscape is stabilized dune forest dominated by shore pine (*Pinus contorta* var. *contorta*), often with a dense understory of rhododendrons and many other species of broadleaf evergreen shrubs. Closer to the ocean, a range of open, early successional dune and deflation habitats are found and are home to several rare pteridophytes (ferns). An unusual northern population of carnivorous California pitcher plant (*Darlingtonia californica*) is found at the Darlingtonia Wayside, and the rare moss *Limbella fryei* grows at Sutton Lake.

### 2 Coast Range Ecoregion

#### Valley of the Giants Outstanding Natural Area, Polk County

The 51-acre forest remnant is a classic example of Coast Range old-growth forest with trees over 400 years old. It is located at the confluence of Warnicke Creek and the North Fork Siletz River.

### 3 Willamette Valley Ecoregion

#### Willamette Narrows, Clackamas County

The area immediately above and below Willamette Falls in Oregon City supports a number of both common and uncommon habitats.

### 4 Siskiyou Mountains Ecoregion

#### Rough and Ready Creek, Josephine County

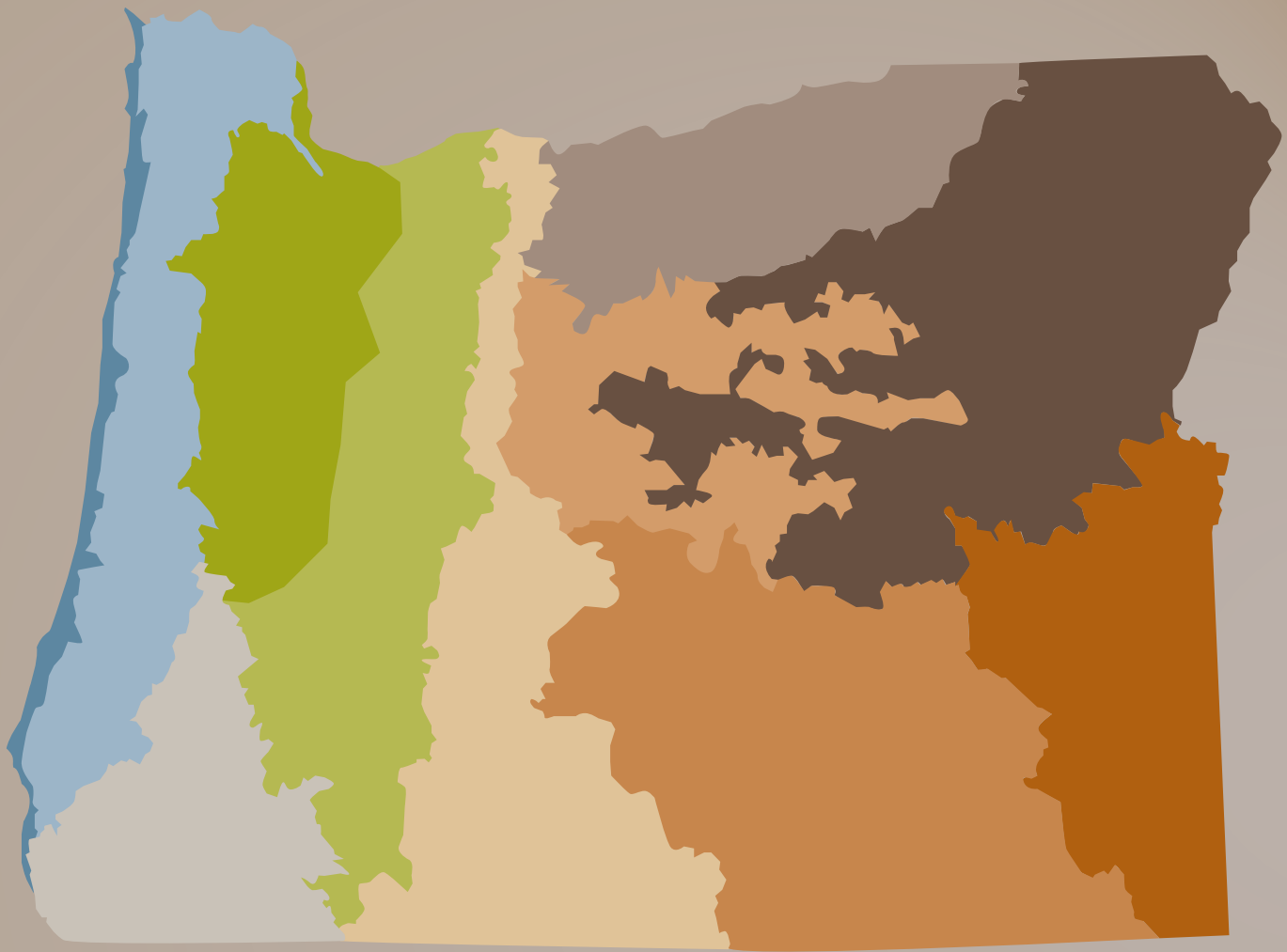
One of the easiest and most rewarding places to experience the serpentine country of the Illinois Valley is along Rough and Ready Creek south of Cave Junction. The alluvial terrace comprised of boulders washed down from the adjacent serpentine slopes supports a xeric shrubland of *Arctostaphylos*, *Ceanothus* and *Garrya* interspersed with diverse native grasses, spring bulbs and wildflowers.

### 5 Cascades Ecoregion

#### Iron Mountain and Cone Peak, Linn County

Iron Mountain, along with nearby Cone Peak and Tombstone Prairie, is well known as a botanical hot spot due to the diverse habitats present, from moist forest to dry meadows and rock outcrops, with significant disjunct species from east of the Cascades as well.





#### 6 Eastern Cascade Slopes and Foothills Ecoregion

##### Gearhart Mountain, Klamath and Lake Counties

Gearhart Mountain is the highest point in this ecoregion, rising to 8,360 feet. Both rocky habitats and wet meadows here are floristically rich, with good representation of genera such as *Eriogonum*, *Leptosiphon*, *Lupinus*, and *Penstemon*, including the endemic blue-leaved penstemon (*Penstemon glaucinus*).

#### 7 Columbia Basin Ecoregion

##### Cottonwood Canyon State Park, Gilliam and Sherman Counties

Cottonwood Canyon State Park is a good central location for exploring the canyon country of the Columbia Basin. This is a landscape for sagebrush and bunchgrasses and is a hot spot for certain genera of the dry interior.

#### 8 Lava Plains Ecoregion

##### Painted Hills, Wheeler County

The Painted Hills are named for the colorful sedimentary deposits associated with the Oligocene John Day Formation and are protected by a unit of the John Day Fossil Beds National Monument. At a relatively low elevation of 2,000 feet, sagebrush and other shrub-steppe communities dominate the vegetation.

#### 9 Basin and Range Ecoregion

##### Fort Rock and Christmas Valley, Lake County

This remote, arid region of northern Lake County has much of interest, particularly in a wet spring. Sagebrush and juniper dominate the vegetation, but an isolated ponderosa pine stand is found in the Lost Forest Research Natural Area.

#### 10 Blue and Wallowa Mountains Ecoregion

##### Skyline Road, Umatilla and Union Counties

Following along the crest of the Blue Mountains at about 5,000-foot elevation, the 40-mile drive along Skyline Road provides easy access to the high country. Try to find the locally restricted *Lupinus sabinianus*, a yellow lupine discovered here by David Douglas during his botanical explorations of the 1820s.

#### 11 Owyhee Uplands Ecoregion

##### Leslie Gulch, Malheur County

Amid Leslie Gulch's canyons and rock pinnacles, ancient volcanic ash deposits with unusual soil chemistry support an array of interesting plants.



# Democracy by Smartphone

Dan Faltesek analyzes the rising influence of social media in election campaigns

By Annie Athon Heck | Illustration by Oliver Day

When he was 16, Dan Faltesek would sit at home in an unfinished basement chatting with a friend through AOL Instant Messenger on the family's Acer computer. It was 1999, before Facebook, Twitter, YouTube and Instagram. The conversation, he recalls, was about "nerdy stuff," Clinton administration politics of interest to him and his partner in a high-school debate class.

Little did Faltesek, now an assistant professor in New Media Communications at Oregon State University, realize that his youthful foray into social media would launch his career.

Today's online landscape has changed drastically. Faltesek immerses himself in the study of social media across all platforms. When he was a teenager, this field didn't even exist, and now it occupies an increasing share of the focus for him and other communications researchers. That's a strong testament to the rapidly expanding role that social media play in a global society.

"Social networks are the next evolution of TV networks," Faltesek says. "People like 'flow media' and streams of news stories, personal stories, ads and a wide variety of content."

From daily news feeds to personal updates and crisis communications, social media are changing the way

people around the world create, share and engage with stories and information. Falsetek refers to this space as the "public sphere." Through his work, he has gained insights on how social media affect election campaigns and are changing the way Americans process news and opinions about candidates — all through engagement in the public sphere.

During this election cycle, for example, Twitter has become a dominant place for people to talk about candidates, debates, primary elections and conventions. "In some respects, this is a new Golden Age for political communications," he says. "People can have political conversations through social media without having to have a screaming match with a drunk uncle at a family gathering."

"As media events unfold, such as the debates during the primaries this year, Twitter can become just like network TV 20 years ago. All the politicians were on Twitter commenting on the candidates and the debates."

Nearly a year before Donald Trump and Hillary Clinton garnered enough delegates to move on to the general election, Faltesek's analysis of hashtags — those "#" symbols used to compile Twitter posts by topic — led him to predict that Trump and Clinton would become





their respective party's "presumptive nominees." In the summer of 2015, Faltesek began collecting and studying large numbers of campaign tweets from all the candidates. At that time, the Republican field was crowded with more than 15 candidates, and Bernie Sanders was beginning his slow rise as a viable candidate for Democrats.

"Trump was getting 12 times the numbers of other candidates in terms of retweets and engagement on Twitter," Faltesek says. "It became clear to me that the candidates' social media activity, or lack of it, was tracking to campaign success. It was just obvious at that point that Trump was winning the nomination."

Damien Pfister, an associate professor of communication at the University of Maryland, has known Faltesek and followed his emerging work. He believes that social media has given populism a stronger foothold in the electoral process.

"Republicans and Democrats are in different universes," he says. "This is amplified by social media as well as traditional media. The media ecosystem is really complicated right now, and that's why we need different takes on it and why Dan's research is so interesting. Looking at how discourse evolves over time, through data analysis of hashtags, for example, can help us understand these different patterns of communication."

This progressive approach to communication research is just beginning to emerge, and Faltesek is on the leading edge. He is convinced that the prevalence of social media, which he believes will only grow and evolve, will continue to change the way Americans navigate the country's increasingly complex political and electoral landscapes.

"New technologies have expanded both the number of channels for reaching voters as well as the capacity to evaluate the effectiveness of those messages," Faltesek says. "Instead of buying national time for a single ad, candidates can focus on very narrow advertisements for different constituents."

In addition to more targeted and personal advertising, which will occur online rather than on television, Faltesek envisions that political work will become more interesting as mobilization efforts and policy communications increase through social media.

"Candidates will be reaching out on social media about the policies they're pursuing instead of running attack ads," he says. "An attack ad is not democracy. People talking to each other on social media, that's democracy."

And we can participate wherever we happen to be, whether in a convention hall in the heat of a campaign or at home in an unfinished basement. **terra**



# Interrogating

Mothers' stories stilled by poverty, bias and war

BY THERESA HOGUE

When Patti Duncan was growing up, her mother rarely spoke about the past. Born and raised in South Korea, Patti's mom spent her younger years working in Seoul next to a U.S. military base. It was there she met Duncan's father, a white American soldier. The two married and later moved to the United States, where they raised their two daughters, Duncan and her older sister.

While towns near military bases are often associated with violence and the sex industry, Duncan's mother never spoke of her experiences in Korea. Her silence left a large gap in Duncan's knowledge of her family history.

Duncan is now an associate professor at Oregon State University and coordinator of Women, Gender, and Sexuality Studies in the School of Language, Culture, and Society. In her research, she explores the ways in which motherhood reflects gender roles, race and culture. Most recently, she has delved into the circumstances surrounding the transnational and transracial adoption of children.

Her journey has been guided by deep, sometimes disturbing questions. How and why are the voices of birth mothers often erased from these stories? Why have so many women been silenced? Do they use silence as a form of resistance? Who

else's stories haven't been heard? Why are some peoples' narratives driven into the shadows?

"I think there were always these questions I had about the context of (my parents') meeting and the history of the circumstances that brought them together, shaped by unequal relationships between their two countries," Duncan says. "A lot of my work was informed by wanting to go back to that and think through the questions of my own origins. For so many mixed-race Asian Pacific American people, there are questions about the ways in which our belonging or not belonging is structured in the U.S. through histories of colonialism and militarism, violence and war."





# the silence

## A Literature of Silence

Duncan's first book, *Tell the Silence*, focused on Asian American women writers who were asking questions about nation and gender, race and sexuality. Her literary analysis looked at how these questions are asked, which discourses are enabled and which are silenced.

While her motivations were rooted in her mother's experiences, her mother has not read Duncan's work or been spurred through the research to open up about the life she led in Korea. But Duncan thinks of herself as writing, in part, to her mother. That approach has helped shape her writing and made it more accessible to a wider audience.

Her second book, *Mothering in East Asian Contexts: Politics and Practices*, offers narratives about the politics of motherhood and analyzes the ways in which it is shaped by race, sexuality and class, and impacted by globalization, transnationalism and capitalism.

While driven by personal experience, Duncan was also inspiring other scholars. "Patti is a pioneer in the scholarship on mixed-race Koreans," says Grace Cho, author of *Haunting the Korean Diaspora: Shame, Secrecy, and The Forgotten War* and a contributor to *Mothering in East Asian Contexts*. "As a biracial Korean American and a product of U.S. military intervention, I found it

incredibly meaningful to get to know Patti and her work, and it gave me the encouragement to move forward with my own research."

Cho's view is echoed by colleagues at Oregon State. "Duncan's work is an outstanding example of how feminist analysis by scholars of color can uncover and explain the invisibility and silences of marginalized populations in dominant discourses," says Susan Shaw, director of the School of Language, Culture, and Society at Oregon State and a scholar of feminist studies in religion.



## Feminist Analysis

Duncan's most recent research project has expanded on that theme by delving into the world of transracial and transnational adoption and its impact on birth mothers of color. The project took root a dozen years ago on her first trip to her mother's homeland.

In 2004, while Duncan was teaching at Portland State University, she and a graduate student visited South Korea. Duncan was doing preliminary research on why feminist organizations were rallying around "comfort women," who had been taken from Korea and other countries to be used as sex slaves in Japanese-occupied countries before and during World War II. She was contrasting that attitude with the stigmatization of women who worked in camps near military bases in Korea. Those women, Duncan thought, suffered under similar forms of militarized sexual victimization.

To many South Koreans, women having sexual relations with American military men was a betrayal of their country and of the racial purity emphasized in South Korean culture, regardless of how economic and social forces may have placed them in the role of sex workers.

The Korean War separated families and displaced more than 10 million people from their homes. In its wake, American military bases became places that accentuated the economic disparities between the two countries, says Duncan. While people in camp towns were poor and had spotty access to clean water and electricity, life on the bases was more affluent. This imbalance is one of the many complex factors that led to the

thriving if publically discouraged practice of South Korean women and American military men engaging in prostitution.

## Give Away Your Child

During the trip, Duncan's research took an unexpected turn when her graduate student, who was adopted from South Korea as a child by American parents, began searching for information on her birth mother. The more they learned about the history and politics of adoption in South Korea, the more Duncan realized there were ties to her research on camptown women. Many of those

"When we look at transnational adoption, we should consider questions like 'Who benefits?' and 'Who gets completely rendered invisible and why?'"

adopted children were the product of relationships between American men and South Korean women working near military bases.

Following the Korean War, Korean women who had relations with U.S. military men and had children were often pressured to give up those children, Duncan says. "Early on they were warned mixed-race children would be rounded up and set on fire. That rumor reached a lot of women who gave up their children, not because they didn't want them but because they didn't want them to die." As a result, a large number of mixed-race children were adopted out to white American parents.

More than 200,000 children from Korea eventually came to the United States. The first wave (1955-1965) were mostly mixed-race children fathered by U.S. soldiers. Since then, adoption has been increasingly linked to women living in poverty, as

well as to the stigma associated with single motherhood in Korea.

"If the system had been such that they could have remained with their mothers, they wouldn't be put up for adoption," Duncan says. "We've seen similar stories in Vietnam and Cuba, and we've seen it more recently with Haiti. If all of the money and resources put into transnational adoptions could have instead been put into supporting mothers and families, that would have been a really different outcome."

## Politics of Motherhood

Duncan began to realize that her experiences of disconnection with her mother's homeland in some ways connected back to experiences of Korean adoptees.

"There were all these similarities in the politics. I'm not an adoptee, and I don't want to appropriate that experience, but I feel like my relationship to a white father and a lot of white family members is very similar to some of the experiences my adoptee friends feel about their adopters," she says. "We have a sense of loss of language, cultural identity and knowledge about our background, and the subtle racism we can face from our own communities and family members."

Duncan admits her trip to Korea, while providing a rich ground for research material, was also profoundly disconcerting. "For many of us, Asian Americans raised in the U.S., you never quite feel at home here," she says, "and you think you're going to go there and it's going to all make sense, and it doesn't at all." Eventually, she started taking those ideas and crafting them into her latest book project, *Saving*



*Other Children from Other Women: Narratives of Rescue, Migration, and Illegitimate Motherhood.*

Duncan relies on a research method called qualitative content analysis. She reviews texts, films and other media as a set of discourses and cultural narratives. She is interested in how these “rescue narratives” are embedded into and actually describe colonialist frameworks and logics.

“There’s something really problematic about a focus on children that negates the experience of

the mothers and fathers and local communities,” she says. “I’m not saying children don’t need resources or help. But there’s often not an understanding that the conditions creating poverty or war or genocide are systemic and are conditions our own government and military are complicit in. And the mothers are then seen as no longer worth saving or even naming, and they drop out of the picture completely.”

Duncan doesn’t ignore the real and necessary need for adoption. Nor

does she broadly criticize Americans who adopt children transracially or transnationally. “I don’t think adoption is going to end, and my point is not that children should not be adopted, but to figure out how and why it’s become a global transnational industry that has harmed some communities more than others,” she says.

“When we look at transnational adoption, we should consider questions like ‘Who benefits?’ and ‘Who gets completely rendered invisible and why?’” **terra**



Left: In this portrait taken about 1974, western outfits worn by Patti Duncan and her sister contrast with their mom’s traditional Korean hanbok. Below: Patti Duncan (Photos courtesy of Patti Duncan)





## Seed Funding for Science

### Promising OSU faculty receive a boost from the NSF CAREER program

Starting a research lab can be like launching a small business. Funding must be secured, space arranged, equipment purchased and staff and students hired. While institutional startup funds give an initial boost, ongoing support is crucial. That's where the National Science Foundation's Faculty Early Career Development Program comes in. In the last fiscal year, based on proposals approved over the previous five years, 11 Oregon State researchers received funding to jump-start studies in computer science, engineering, robotics, mathematics, physics and other fields.



#### **ANITA SARMA, COMPUTER SCIENCE**

##### **Networking for software development**

Computer software may be written by individuals, but it takes a community to successfully implement it. Sarma works at the interface of the technical and social details that underlie new software code. Her goal is to ensure that new features work smoothly within existing programs and that software developers can leverage the social and communication networks to achieve success.



#### **STEPHEN RAMSEY, COMPUTER SCIENCE AND BIOMEDICAL SCIENCES**

##### **Genetic regulation in disease**

Teasing out the tangle in the body's genetic machinery can help researchers find new treatments for diseases from cancer to the flu. Ramsey uses bioinformatics, a powerful combination of molecular biology and computer modeling, to understand how genes are activated. His goal is to understand the regulatory networks that underlie chronic diseases and inflammation.



#### **DANIEL DIG, COMPUTER SCIENCE**

##### **Improved smartphone apps**

As smartphones have proliferated, so have mobile apps, but these software programs can become unresponsive and "freeze." By analyzing more than 1,000 apps, Dig has found two main problems: underuse and misuse of a technique called asynchronous programming. Asynchrony is at the heart of keeping apps running smoothly, says Dig. Dig's team has sent hundreds of patches to programmers to fix problems in their code.



#### **MICHAEL ROSULEK, COMPUTER SCIENCE**

##### **Data security**

Cryptography conjures notions of spies, secret codes and international intrigue. However, data security has become a matter of standard practice in business, social media and other spheres as well as government. Rosulek develops computational tools that can be used to protect data in use as well as information stored in archives.



#### **KARL SCHILKE, CHEMICAL, BIOLOGICAL AND ENVIRONMENTAL ENGINEERING**

##### **Surface coatings for biomedical devices**

Treating diseases such as sepsis (blood poisoning) and diabetes means processing biological fluids like blood through filters and other devices. Schilke is developing methods to modify the interior surfaces of such devices to make treatments safer and more effective. Technologies under investigation in his lab include surface coatings that provide desirable biological function (pathogen capture) while also being nontoxic, stable, inexpensive and compatible with blood and other fluids.





## **DEVLIN MONTFORT, CHEMICAL, BIOLOGICAL AND ENVIRONMENTAL ENGINEERING**

### **Engineering education**

Our assumptions about how we know something and what counts as knowledge — aka, our epistemologies — affect our ability to collaborate and solve problems. Montfort works with engineering faculty and students to explore and evaluate their own epistemologies against the demands of engineering practice. His work will lead to the development of new educational methods to produce more agile, effective engineers in the future.



## **RAVI BALASUBRAMANIAN, MECHANICAL ENGINEERING**

### **Body and machine**

Balasubramanian seeks to design implantable, miniature, passive mechanisms — such as soft tendon networks and pulleys — for attaching muscles to tendons and bone in orthopedic surgery. These mechanisms, inspired by their use in robotic devices, will enable re-engineering the human body through surgery to provide customized force and movement transmission based on a patient's desired manipulation and locomotion function.



## **ARUN NATARAJAN, ELECTRICAL AND COMPUTER ENGINEERING**

### **Expanding data networks**

An exponential increase in wireless network capacity is required over the next decade to enable existing and emerging applications centered around wireless-capable devices such as smartphones and Internet-of-Things networks. Natarajan's research focuses on techniques for two purposes: increase the amount of data that can be packed in densely utilized spectrum bands; demonstrate high-capacity wireless networks operating at high frequencies where a large amount of spectrum is still underutilized. These techniques are also being translated to radar and wireless imaging systems for sensor applications



## **XIULEI JI, CHEMISTRY**

### **Batteries for renewable energy**

Carbon-based materials have the potential to increase our ability to store energy and convert it from one form, such as solar or wind, to another, such as electricity. Ji is investigating the atomic-scale structure of advanced electrode materials in order to develop new approaches that can be beneficial for renewable energy systems. Among the applications under study in his lab are new batteries and configurations of devices for energy storage and conversion.



## **ETHAN MINOT, PHYSICS**

### **Carbon nanotubes**

Minot investigates two forms of carbon — graphene and nanotubes. These nanoscale materials offer opportunities for more efficient solar energy harvesting, medical diagnostics and chemical sensing. The CAREER Award focuses on the photovoltaic properties of carbon nanotubes, while other ongoing projects delve into biosensing applications of graphene.



## **DEBASHIS MONDAL, STATISTICS**

### **Statistical methods for spatial information**

Spatial data — information about where something is located in a two- or three-dimensional space — are used to solve problems from groundwater contamination and medical diagnostics to the distribution of galaxies. Mondal is developing new statistical theories and methods to analyze spatial data in ways that lead to new models and computations in a wide range of disciplines.



## Coral Reefs Hit by One-Two-Three Punch

Stress amplifies impact of warming water

A combination of factors – overfishing, nutrient pollution and pathogenic disease – is affecting coral reefs around the world and ultimately becomes deadly in the face of higher ocean temperatures.

Last summer, Oregon State microbiologist Rebecca Vega Thurber and researchers at seven other institutions published the results of one of the largest and longest field experiments done on this topic in the journal *Nature Communications*.

“This is grim news, but at least it will help settle the argument over why

corals are dying,” says Vega Thurber, an assistant professor in the College of Science.

“This makes it clear there’s no single force that’s causing such widespread coral deaths,” she adds. “Loss of fish that help remove algae, or the addition of excess nutrients like those in fertilizers, can cause algal growth on reefs. This changes the normal microbiota of corals to become more pathogenic, and all of these problems reach critical levels as ocean temperatures warm.”



## Researchers Produce Sterile Poplar Trees

Advance could reduce concerns over gene flow

Forestry scientists have found a way to arrest the development of flowers in poplar trees, paving the way for control of the unintentional spread of engineered or nonnative tree species.



With this method, researchers raise the possibility of developing trees as crops for biofuel and other industrial purposes while preventing them from becoming established in nearby forests.

“Our goal isn’t to make reproductively modified trees just to have that trait,” says Amy Klocko, postdoctoral scientist in the College of Forestry. “It’s to prevent genetically modified or nonnative trees from spreading, either to wild forests or to other plantations. This would help alleviate concerns over gene flow, whether for scientific or ethical reasons.”

Klocko works in a lab directed by Steve Strauss, distinguished professor of forestry. She and her colleagues used a technique known as RNA interference to suppress a gene that is known to play a central role in the development of flowers in poplars and many other plants.

The gene, which scientists call LEAFY, is still present in the trees, but RNA interference acts like a brake to slow down the gene’s activity. Scientists grew trees containing the gene-slowing technology in experimental field trials authorized by the U.S. Department of Agriculture in the Willamette Valley.

## New Treatment Goal: Control Cancer

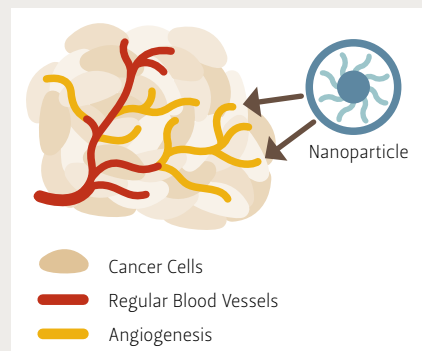
Low-dose replaces maximum tolerable therapy

Researchers have created a new drug delivery system that could improve the effectiveness of an emerging concept in cancer treatment – to dramatically slow and control tumors on a long-term, sustained basis, not necessarily aim for their complete elimination.

“This new system takes some existing cancer therapy drugs for ovarian cancer, delivers both of them at the same time and allows them to work synergistically,” says Adam Alani, an associate professor in the Oregon State University College of Pharmacy and lead author of a report in the journal *Chemistry of Materials*.

“Imagine if we could manage cancer on a long-term basis as a chronic condition, like we now do high blood pressure or diabetes. This could be a huge leap forward.”

The approach uses significantly lower doses of chemotherapeutic drugs but at more frequent time intervals. This would have multiple goals of killing cancer cells, creating a hostile biological environment for their growth, reducing toxicity from the drug regimen and avoiding the development of resistance to the cancer drugs being used.



Further testing is needed in both animals and humans for safety and efficacy. In prior work with related systems in animal tests, OSU and collaborating researchers have been able to completely eradicate tumors.





## THE OREGON STATE UNIVERSITY ADVANTAGE

Connects business with faculty expertise, student talent and world-class facilities, and helps bring ideas to market and launch companies.



### Musical Openings

#### A flying disc may prompt new form of therapy

It started out as a “fun toy,” a flying disc that plays music. But when Alex Dassise, one of the inventors, tossed it to his brother Stefan, their connection fundamentally shifted.

As a child, Stefan was diagnosed with autism; he doesn’t speak. His interaction with Alex had always been severely limited. “The first time we threw it, it was amazing,” says Alex. “It was the first time of interactivity between us. We were engaged. We got to laugh, smile and dance. It was a whole new relationship.”

Alex was a senior at Lakeridge High School in Lake Oswego when he and a friend, Logan Insinga, came up with the idea of the music-playing disc. When he came to the College of Business at Oregon State, Alex entered the Austin Entrepreneurship Program. With help from director Sandy Neubaum and program manager Dale McCauley, he began turning his idea into a product. He spent hours using the 3-D printing and other resources in the Weatherford Hall “maker space.” He created a company, DiscJam, pitched his idea at a venture conference in Bend and sold 50 discs to other students. He

Alex Dassise and Spencer Kleweno have formed a company, Seiji’s Bridge, to produce programmable flying discs. (Photo: Nicki Silva courtesy of the *Daily Barometer*.)

won first place and \$1,000 in a “Shark Tank” competition organized by OSU and the University of Oregon.

But then Dassise discovered that the disc may offer a new avenue of communication for autistic people. “There aren’t other products that have all these features. It’s visual, because there are lights. It’s engaging and kinetic because you can throw it back and forth. It has audio,” says Alex.

Last summer, with help from the Accelerate program in the Oregon State University Advantage Accelerator, the company, now known as Seiji’s Bridge (Seiji is Stefan’s middle name), is exploring the potential for the disc to serve as a therapy tool. Dassise and his partner, Spencer Kleweno, a senior in the College of Business, are giving prototypes to therapists (speech, occupational and physical) who are testing the potential for the disc to open new avenues for communication with their clients.

“I hope this becomes a basic learning tool,” says Alex. “You could learn a language with it or learn to count. The market is anyone who needs to develop skills. There’s a lot of potential.”

To discover what the **Oregon State University Advantage** and the **Advantage Accelerator program** can do for your business, contact Brian Wall, assistant vice president for research, commercialization and industry partnering, 541-737-9058, [brian.wall@oregonstate.edu](mailto:brian.wall@oregonstate.edu). [oregonstate.edu/advantage](http://oregonstate.edu/advantage)



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An enthusiastic welcome greets TERREWODE staff in the rural villages of Uganda. Oregon State students in business, engineering and medical anthropology are assisting the nonprofit organization and learning about multicultural partnerships. See "Lessons in Resilience," Page 6. (Photo: Joni Kabana)

