CASCADE

WINTER 2014

UNIVERSITY OF OREGON COLLEGE OF ARTS + SCIENCES

THE SLEEPING GIANT

PROBING THE DEPTHS OF THE PACIFIC OCEAN, GEOPHYSICISTS ASSESS POTENTIAL FOR THE BIG ONE

TRANSFORMATIONS AND AFFIRMATIONS OF WHAT WE DO BEST

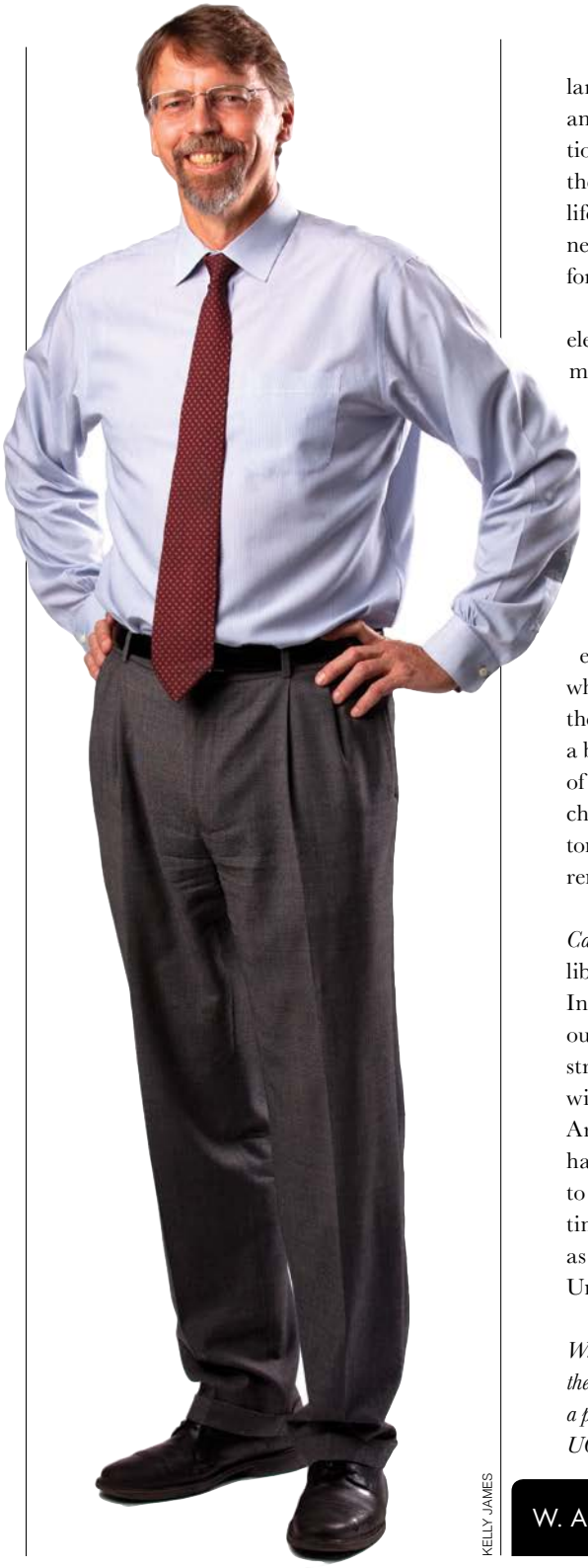
Big changes are afoot at the University of Oregon.

On July 1, 2014, the independent board that the UO administration sought for so long will be invested. This board will bring new opportunities for the UO to seek funding, contain costs and pursue creative solutions to improve education and research. But the new board will also bring increased scrutiny and accountability—rather than one board spreading its efforts over eight Oregon universities, we will have one board focusing all its attention on ways to make the UO ever better.

Another big change—in October 2013, the faculty union ratified a first-time contract for tenured and nontenured faculty members at the university. The new contract regularizes employment practices across the entire university. It also requires immense effort in its early years as we revise or implement policies and practices to be consistent with the bargaining agreement.

These transformations are taking place in a much larger context: the rapidly shifting landscape of higher education in America. Across the nation, we continue to see disinvestment in public higher education and reduced availability of research funds. This disinvestment means that public universities are increasingly competing with one another for limited resources, whether it be research dollars, out-of-state students and the higher tuition they pay, or faculty members who can meet the challenges of this new environment.

And the biggest change? From my perspective, it is the ongoing shift in our student population. This year, the entering class has an average grade point average of 3.60, the highest in the university's history. Our student body is also more diverse than ever, with 27 percent domestic minorities and 10 percent international students. Our university literally has a new face.



KELLY JAMES

Any one of these changes would be large in terms of managing the university and articulating its vision. In combination, they represent a major sea change, the largest any of us are likely to see in our lifetimes at the UO. What occurs over the next several years will set the trajectory for decades to come.

Yet, in the midst of all this change, one element remains constant: our commitment to the liberal arts as the core of what we do. As I travel the country, I hear repeatedly from our alumni that what set them up for their careers and lives was not training in a particular topic, but training in habits of the mind. The ability to question critically, think logically, communicate clearly, act creatively and live ethically is what enables our students to thrive in a world where we cannot predict the social context, the economy or the jobs of tomorrow. Add a bit of the Oregon magic—a strong sense of community, a commitment to social change, a belief in improving the world for tomorrow—and you have the recipe for a remarkable future for each of our students.

As you read through this issue of *Cascade*, you will see the elements of the liberal arts—Oregon-style—highlighted. In fact, in this time of dramatic change, our commitment to this core belief is so strong that we are choosing to celebrate it with our new messaging for the College of Arts and Sciences: "It's Elemental." Never have the liberal arts been more central to the success of our students. Now is the time to celebrate and share that story as we set the course for the future of the University of Oregon.

W. Andrew Marcus was named acting dean of the College of Arts and Sciences on July 1. He is a professor of geography and proud parent of two UO graduates and a current UO student.

W. ANDREW MARCUS, ACTING DEAN

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THE ELEMENTAL STORY

HOW TO DESCRIBE THE IMPORTANCE OF THE COLLEGE OF ARTS AND SCIENCES?

IT'S ELEMENTAL.

MICKEY STELLAVATO

This issue of *Cascade* marks the print debut of the new design theme for the College of Arts and Sciences: It's Elemental.

The design concept emphasizes the fundamental role of the arts and sciences at the UO.

With 865 faculty members, forty-six undergraduate major fields of study and twenty-three doctoral programs, the College of Arts and Sciences (CAS) is the academic hub of the university. Virtually all undergraduates take their core (elemental) courses in the college and about two-thirds of them go on to get a degree in CAS; the college also trains 75 percent of all UO doctoral students.

"Part of the challenge with communicating the value of the College of Arts and Sciences is our diversity and our size," said Acting Dean W. Andrew Marcus, a geography professor.

"The elemental design concept deliberately embraces the size and complexity of CAS," he said. "It gives us the opportunity to show how all of its elements—namely, our forty departments and programs and those forty-six fields of study—can operate as distinct units while also forming a whole that is more than the sum of the parts."

A completely redesigned website, cas.uoregon.edu, now showcases the "It's Elemental" concept in a bold, color-coded design. One of its main features is a design system that creates a symbol for each department and program, much like the elements in a periodic table. These are color-coded: Humanities departments and programs are grouped in shades of blue, the social sciences have green accents and the natural sciences, yellow and red.

The design also enables departments—ranging from anthropology to medieval studies to computer and information science—to emphasize the elemental nature of their field, while also placing them within the larger arts and sciences family. At the same time, the design helps convey how dynamic and flexible the arts and sciences "elements" can be, Marcus said.

In the early phases of the rollout, several departments have already adopted the design for their websites: philosophy, geological sciences, folklore, general social sciences, Romance languages and women's and gender studies, with more to follow.

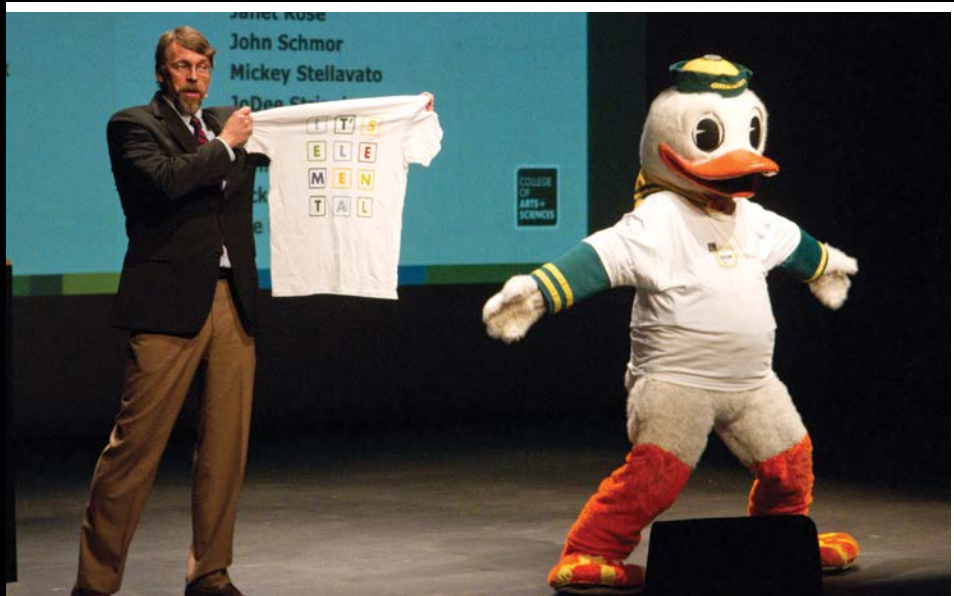
The public debut of the elemental theme was DUKTalks, an annual College of Arts and Sciences event that features the best and the brightest of the CAS faculty, students and alumni who offer presentations styled on the popular TED Talks. (DUK stands for Discovering University Knowledge.)

CAS IT'S ELEMENTAL

The second annual DUKTalks took place on September 27 in the Robinson Theatre. Two hundred guests (alumni, faculty and staff members, students and friends) heard wide-ranging, fast-paced talks by six speakers who shared their individual paths of discovery and their personal connection with the elemental theme. —LR

Watch the videos at duktalks.uoregon.edu

Left: In his DUKTalk, alumnus Tucker Bounds (Political Science, '02), director of communications at Facebook, reflected on his careers in presidential politics and high-tech. Below: The Duck models the official DUKTalks "It's Elemental" t-shirt, ably assisted by W. Andrew Marcus, acting dean. Right: Rossmary Marquez, a native of Venezuela and a first-generation college student, shared how her exploration in the arts and sciences has defined her experience at the UO.



Q+A

Virtue & Vice

IS CHARACTER FIXED OR DOES IT DEPEND ON CIRCUMSTANCE?

INTERVIEW BY LISA RALEIGH

Mark Alfano (right), a new faculty member in the Department of Philosophy, is an experimental philosopher. This is an emerging area in philosophy that uses experiments to investigate philosophical topics, including the ways that moral or ethical behavior are influenced (or not) by circumstances.

One classic study: A group of seminary students were asked to prepare a sermon on the Good Samaritan—and on their way to give the sermon, each of them encountered a person in need of assistance. Would they stop and lend a hand, as the Good Samaritan did? Some stopped to help, others did not.

Presumably all of the students valued the ideal of selfless intervention on behalf of another human being. But there was a factor unrelated to virtue that was most likely to influence whether a student stopped: how pressed they were for time. In general, those who were told they were running late did not stop to help; those who perceived they had more time were more likely to offer assistance.

In his research, Alfano explores scenarios like these that probe the intersection of the internal (belief systems and values) and the external (actual behavior), and the ways that social expectations influence both. In his recently published book, *Character as Moral Fiction*, he argues that virtues such as courage, honesty and open-mindedness are not so much fixed traits as "social constructs" that can be molded and developed through social interactions.

Q Let's start with a character trait like generosity—in your view, does this refer strictly to a pattern of behavior or can it also be an internal trait? In other words, can I only act generously or can I also *be* generous?

A It's both, I think. There are a number of interesting experiments that are relevant. In one, researchers asked people to take what they thought was a personality test and told some of the subjects at random, "It turns out that this personality test says that you're generous." The researchers then gave another group the same test and told them that the test indicated that they were stingy. Later, when the study subjects had an opportunity to give money to a charity, the ones who had been told they were generous gave a lot more money.

The natural question is, "Why are they doing that?" One theory is that, as a result of being told they have this trait, they think to themselves, "Am I going to give? I am a generous person. That's a natural thing for me to do. That sounds right." Whereas those whose self-concept has been moved in the other direction by being told they're stingy, might say, "Well, I guess I am kind of stingy; so, no, I'm not going to give." Of course, you might think it would go in the other direction, where someone might react and say, "No, I'm not stingy. You don't know me like that." But in this experiment and others like it, behavior typically moves in the direction of the attribution.

VIRTUES SUCH AS COURAGE, HONESTY AND OPEN-MINDEDNESS ARE NOT SO MUCH FIXED TRAITS AS "SOCIAL CONSTRUCTS" THAT CAN BE MOLDED AND DEVELOPED THROUGH SOCIAL INTERACTIONS.

On the one hand, this is behavioral because people end up giving or not giving. But on the other hand, it's internal because it appears that self-concepts change among the people in these studies. And then there's a third aspect: it's also social because when I tell you that my personality inventory indicates that you're generous, now you know that I expect certain things of you. I don't think that it's possible to divorce any of these three from the others entirely.

Q Isn't there a danger that this shaping of thought and behavior could be used in manipulative ways?

A This kind of experiment does look sort of manipulative. But the experiment is supposed to just give us evidence for how these things work. The suggestion isn't that we should go around giving people sham personality inventories all the time.

MATT COOPER

In fact, now that we know that telling people that they have certain traits can lead them to act in accordance with those traits, we should be very careful. We should be extremely reluctant to call people stingy or cowardly or otherwise vicious. And we should be generous about attributing virtues.

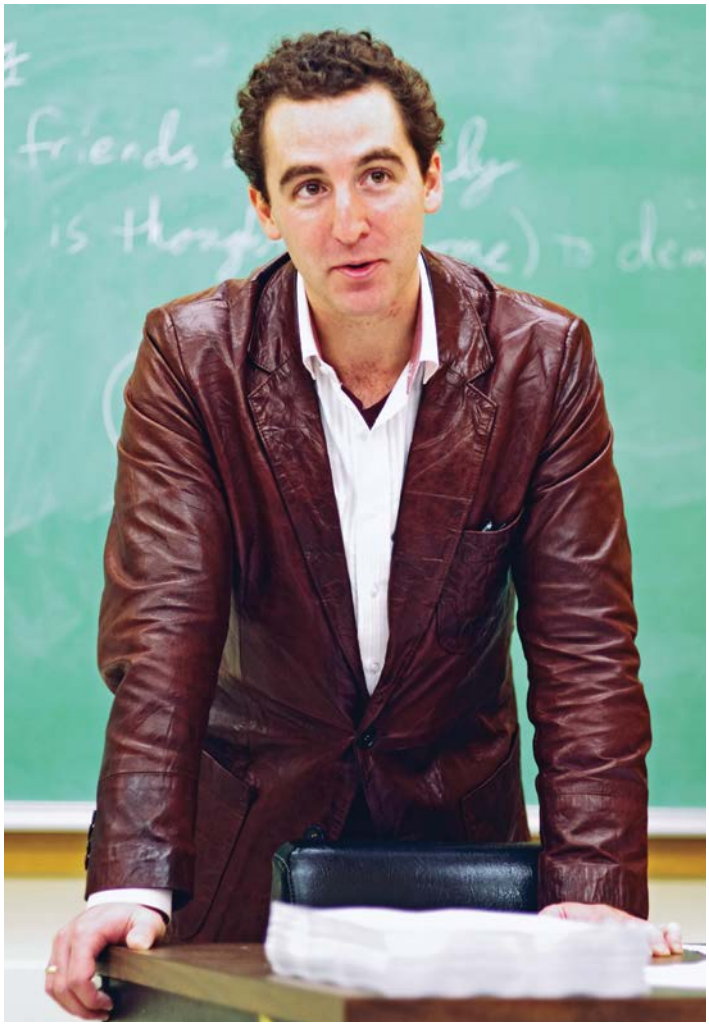
But the findings themselves are morally neutral. You can have a piece of technology and use it to do good things, or you can have the same piece of technology and use it to do bad things. It enables us; it gives us certain powers. That's what technology does. But that doesn't mean that it should just be used willy-nilly. Part of what I try to point out in my book is that we're already doing this all the time without realizing it. It's not like this is something completely foreign to human nature.

One place in particular where we do this all the time is in schools. It turns out that representing someone as having a studious disposition will tend to have exactly the same kind of effect as representing someone as having a particular moral disposition. So when teachers, for instance, unthinkingly say of a student, especially in front of others, "He's not very hardworking" or "She's very studious," they're using this kind of "moral technology," possibly without even realizing it. Part of the idea is to become more aware of what we do and to be more careful and intentional about it.

Q It sounds like a self-perpetuating cycle: someone behaves in a way that is consistent with the way they're perceived (or believe they're perceived), and their behavior in turn reinforces the perception.

A Right. You get a looping effect: If someone is told that they've got a trait and then they act as if they've got the trait, the person who made the attribution in the first place could then say, "Now I have evidence. I was right all along." It's very easy to fail to notice that the person making the attribution is setting this in motion, whether they know it or not.

There's an important longitudinal study of students in Saint Louis, for instance, that showed students were performing worse because they were labeled in a negative way and also treated accordingly, generating a feedback loop that created a self-perpetuating phenomenon.



Q But in this model, how do you account for a student who does well nonetheless?

A That's a very important question because it would be enfeebling to think that there's nothing we can do about this—to think that if someone came along and said, "You're vicious," or "You're lazy," then you're stuck with it. In the studies like the one in Saint Louis, we don't know about the rest of each student's life—an individual might come in having a very strong self-concept; maybe their families were very supportive. It's really hard to know. There could be any number of other social factors, or just individual dispositions, that could lead someone to hold up in the face of negative treatment.

So it's not a deterministic model. The idea is that there are tendencies, based on the labels that we apply to people.

Q What role do motives play? Do good intentions matter?

A Different philosophers put different degrees of emphasis on motives and behavior. For instance, Julia Driver thinks that all that really matters is behavior. But, of course that means that indirectly a person's motives will matter because we tend to achieve what we aim for. Other philosophers will put most of the emphasis on the motives and say, "As long as you're generously motivated, if you turn out not to help people, if your behaviors aren't actually effective in bringing about the alleviation of suffering or the improvement of people's lives, that's sort of neither here nor there."

I personally side more with those who think that behavior is the key component. It's very easy—and it's happened a lot in recent philosophy—to think only about people's intentions and motives and not worry about what happens when they actually act. But if ethics doesn't involve real behaviors, if it doesn't involve what people manage to accomplish or fail to accomplish, then it's sort of a loose wheel; it's irrelevant. That's why I favor more the behavioral approach.

The Good Samaritan experiment helps illustrate why. There, we have people who presumably think they ought to help others—and they're on the way to give a sermon encouraging others to act like the Good Samaritan—but they don't end up helping just because they're in a rush. Given these strong situational influences on behavior, we need to care about those as much as we care about motives. Focusing only on motives leaves out a lot that matters to ethics.

Situational influences can arise very quickly and easily. You might not even notice them; they can seem trivial. And some of them don't even provide a reason to act one way or the other. For instance, if I tell you, "Here's a person in need. Are you willing to donate money to help that person?" And then I tell you, "Oh, by the way, it's really bright in here" or "Oh, by the way, you can smell cinnamon," you'd probably think that's irrelevant. But these factors turn out to matter quite a bit. In numerous studies, these "situational nonreasons" seem to have a pretty strong influence on our behavior. If it's brighter, if it smells good, you're more likely to give.

I try to contrast these with bad reasons and temptations. A bad reason for overeating would be to say, "It tastes so good to have another slice of cake." We already understand how temptations work, to some extent, and it's not surprising that temptations influence our behavior. But if someone eats extra cake because it's on a bigger plate, or if the lighting in the room is pleasing, those are nonreasons.

Q In your book, you talk about how behavior can be influenced by the perception of someone watching—even if it's just a representation of a face. How does that work?

A This goes all the way back to the beginning of the history of philosophy. In Plato's *Republic* there's a story about a character called Gyges who finds a magical ring that, when he puts it on, makes him invisible. Gyges starts out as a simple shepherd, and the first thing he does when he gets the ring is the first thing that anybody would do if they had the power of invisibility: he eavesdrops on his friends. The next thing he does is also something that probably a lot of other people would do: he becomes a criminal. He goes to the royal palace, rapes the queen, murders the king and usurps the throne.

The claim in *The Republic* is that almost anyone, no matter how seemingly virtuous they are, would act in the same way if they had this power of invisibility—namely, the ability to not be seen and held to account and looked in the eye. You have the same theme running through the history of philosophy. You see it in Epicurus, who set up a statue of himself in the garden at his school. That's funny because Epicurus is on the record saying you shouldn't make statues of people to honor them. So either he's just a hypocrite or there's something else going on here. My guess is that the statue in the garden is meant to be sort of a symbolic watcher, which fits nicely with certain fragments that survive from Epicurus, particularly, "You should always act as if Epicurus were watching you."

This same theme comes all the way through to the British philosopher Jeremy Bentham, who came up with the "panopticon" design for prisons, which is basically a house of mirrors. There are windows everywhere; everyone can be seen at all times. He claims that, as long as people know they could be seen, they'll regulate their own behavior and act as the one watching them would prefer them to act. So you don't actually need someone always watching; you just need the possibility of being watched. This has proved to be almost too effective, as the philosopher Foucault describes in *Discipline and Punish*.

And you don't need an actual human. One example of this is the dictator game, which is a game that experimental economists use to look at behavior. In the dictator game, one person—the dictator—gets a pool of money, let's say ten dollars, and is told, "You can give as much or as little as you like to the recipient," and that's the whole game. They just give some, or they give none.

> "ALMOST ANYONE, NO MATTER HOW SEEMINGLY VIRTUOUS THEY ARE, WOULD ACT IN THE SAME WAY IF THEY HAD THIS POWER OF INVISIBILITY."

The most common thing to do is to keep everything. The second most common thing, actually, is to give half. In this experiment, when people played the dictator game on a computer and the desktop had a picture of a face on it, the players gave more to the recipients than when there was just a blank desktop. This has been replicated a number of times. The image can be a robot face; it can be an iconic face; it can even just be three dots arranged in a face-like pattern. This pattern is known to engage the fusiform face area of the brain. It's like we've got a modular face detector and if you set that off, people tend to be more pro-social.

Besides artificial games, this also works in more real-life behavioral settings. Elizabeth Bateson found that people litter half as much when they're eating in a cafeteria where there are images of faces on the walls than when there are images of flowers. Another instance involved honesty. Bateson put out a tea station where people were supposed to make their own tea and then pay a small amount, and they switched the decorations in the room—faces and flowers—every week. People paid 276 percent more for their tea on the weeks when there were faces on the walls than when there were flowers. This is an effect that's been replicated quite a few times now.

Q So much of this crosses the boundary into social psychology, but you're a philosopher. How did you arrive at this juncture?

A It's an interesting question. All of my degrees are in philosophy, but I've always been interested in psychology. I first got interested in the philosophy of Nietzsche. You might think, "Well, he's a nineteenth-century German philosopher, what does that have to do with empirical psychology?" But Nietzsche is extremely insightful, not just about abstract ethics, but about how actual people are motivated, how they behave and the strange twists and turns that lead to their behavior. If you start from this perspective—if you really want to explain people's behavior in moral contexts—then you can't just have the theory of morality, you also have to have the theory of behavior.

The idea that philosophy is separate from psychology is a relatively new phenomenon. The first psychology-philosophy split was tentatively initiated at Harvard by William James in the late nineteenth century and only completed in 1936. So the distinction is only about 100 years old. And now, just over the last couple decades, there's been a movement called experimental philosophy, which involves conducting experiments. Sometimes philosophers conduct them directly, with the guidance of people who are more well-versed in experimental design and interpretation. Sometimes the research is conducted by philosophically savvy psychologists or other social scientists who end up publishing about philosophy because they find it interesting.

Q How do you see yourself fitting into the UO community?

A I feel very at home in the philosophy department here at the UO, a department that is quite unusual because faculty members here approach philosophy from many diverse perspectives—American pragmatism, feminism, Continental (meaning European)— and welcome others who do the same. I was brought in because of my empirical work, but my next book will be on Nietzsche. And I'm delighted that members of other departments have been so welcoming and keen to collaborate. In my graduate seminar last fall, I had guest lectures from Azim Shariff (psychology) and Bill Harbaugh (economics), among others.

THE SLEEPING GIANT

SEISMOMETERS ON THE OCEAN FLOOR HELP UO GEOPHYSICISTS ASSESS POTENTIAL FOR THE BIG ONE

BY MATT COOPER

OFF THE COAST OF THE PACIFIC NORTHWEST, A GIANT SLEEPS.

It lies along the trench where the North American continent is colliding with the Juan de Fuca plate. Along the 700-mile stretch where these earthen masses meet and the Juan de Fuca plate is being pushed under the West Coast, pressure is building. When this area breaks—and it will—the region could experience a magnitude 9 earthquake and tsunami on the order of those that devastated South Asia in 2004 and Japan in 2011.

No one knows the exact characteristics of this "locked zone" called Cascadia. But University of Oregon geophysicists Doug Toomey, Emilie Hooft and Dean Livelybrooks intend to find out. With funding from the White House itself, these UO researchers are part of a national effort to study this zone, to determine its size and shape and to learn how this volatile area will behave when it eventually buckles.

To put a face on the giant, so to speak, before it rises up.

Toomey is leading the expedition team for the Cascadia Initiative, a four-year, $30 million project funded by the National Science

Foundation that features the largest array of offshore earthquake-measuring instruments in history. Hundreds of seismometers are recording vibrations on the ocean floor from the Canadian border to Northern California, including—for the first time—the recording of tremors in shallow water, a critical area that has historically been too difficult to monitor due to the operation of fisheries.

Around the world, wherever tectonic plates collide, there are unstable subduction zones—areas where immense amounts of energy are stored as one tectonic plate is pushed under another or "subducted."

"The project will tell how Cascadia is locked along the coastal area," Toomey said. "The extent to which the locked zone does or does not go onshore dictates the intensity of shaking in that region. It is this intensity that knocks down structures, so knowing how far Seattle or Portland or Eugene are from the locked zone helps estimate risk."

AVERTING DISASTER

It's imperative to get a better understanding of the likely effects of a major earthquake and tsunami because the Pacific Northwest is ill-prepared for such an event. A state commission on seismic safety and policy reported to the legislature last February that Oregon is "far from resilient" to the impacts of a magnitude 9 earthquake.

Without improvements, fatalities are estimated at 1,250 to more than 10,000, with tens of thousands of buildings destroyed or extensively damaged and tens of thousands of households displaced. There would be $30 billion in direct and indirect economic losses, close to one-fifth of Oregon's gross state product.

The NSF is funding the Cascadia Initiative in part with $10 million from the American Recovery and Reinvestment Act for "research to avert disaster . . . and understand the threats posed in this important region," as stated in White House literature describing 100 projects supported under the 2009 economic stimulus package.

A specialist in the seismic structure of plate boundaries, Toomey is overseeing a national group of scientists who are deploying and recovering ocean-bottom seismometers and developing education and outreach programs over the four-year period ending in 2015.

He was chosen for the role not just because of his background and his close proximity to the Cascadia subduction zone, but because he has an excellent command of both the big picture and the details necessary to carry it out, NSF officials said. Toomey has been involved with the initiative since its inception, proposing adjustments such as the use of less-expensive temporary seismic stations to keep the project on track.

> THE $30 MILLION, FOUR-YEAR PROJECT FUNDED BY THE NATIONAL SCIENCE FOUNDATION FEATURES THE LARGEST ARRAY OF OFFSHORE EARTHQUAKE-MEASURING INSTRUMENTS IN HISTORY.

"Doug stepped forward and made the case to parts of the NSF that this really should go forward," said Donna Blackman, a program director with the foundation's Division of Ocean Sciences. "Lots of other scientists in the community agreed with the high priority of this science and societal implications."

FIND AND RETRIEVE

"Jason going over the side. Enable thrusters."

The order came from a pilot onboard the *Atlantis* research vessel—and with it, a boxy, remotely operated vehicle (ROV) about the size of a Mini Cooper—dubbed "Jason"—was lowered into the Pacific Ocean and began scouring its depths, tethered to the ship by a six-mile fiber optic cable that delivers electrical power and commands.

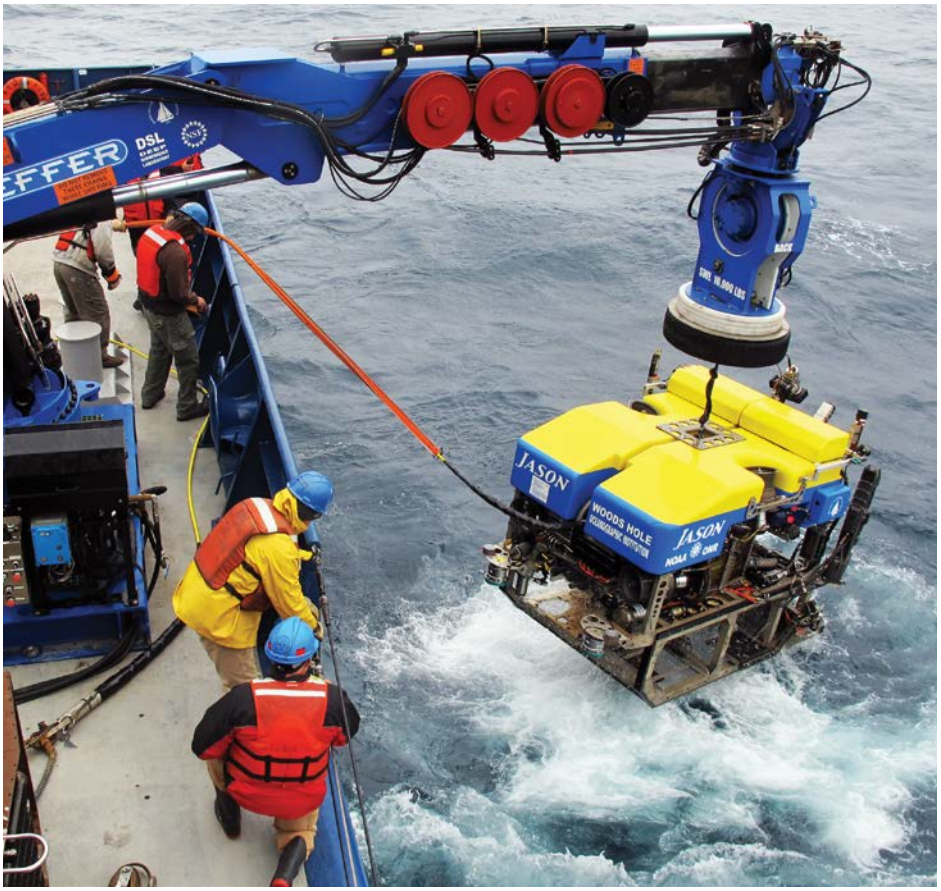
Its mission: Find and retrieve seismometers from the ocean floor.

This operation was repeated many times over during a voyage last summer by a Cascadia Initiative research team that included UO geophysicist Dean Livelybrooks.

During a two-week trip with more than a few ups and downs—read: unusually rough waters—the "Jason dives" were featured attractions for scientists and ship crew alike.

For the uninitiated, life at sea is a study in contrasts: the excitement and anxiety of setting sail, coupled with the boredom of long hours when there is nothing to do; the steady metronome of mealtime (7:30 a.m., 11:30 a.m., 5:30 p.m.), offset by the crew's odd hours (shifts starting at 4:00 p.m., 8:00 p.m. or even midnight); the absence of visible land for days on end, at once both exhilarating and unsettling.

Marine life provided rich experiences for first-time sailors on *Atlantis*. A starfish brought onboard from a Jason dive drew a crowd of



MATT COOPER

***Jason, a remotely operated vehicle used to retrieve seismometers, is lifted onto* Atlantis.**

curious hands to tentatively touch it; images shot from the ROV's underwater cameras also displayed a pink squid, a gape-mouthed lingcod and a lissome brown shark.

Early in the trip, a school of Pacific whiteside dolphins surfaced on the starboard side and raced the ship for a minute or two, merrily showing off their aquatic athleticism as they darted over and under waves. A few lucky observers also saw a humpback whale breach, providing the highlight of the trip even for seismology students who were onboard to study earthquakes.

The weather was no less memorable, if not always pleasant.

The first Saturday was gorgeous: blue skies, a beaming sun and a placid Pacific. Student researchers who had been logging long hours in front of computer screens took the opportunity to sunbathe, read on the ship's bow and even engage in an impromptu squirt-gun fight.

But high winds and heavy seas were the story of the trip. Winds reached fifty miles an hour, generating ocean swells of twelve feet and sentencing the *Atlantis* to a relentless, disorienting rise-and-fall motion that had even seasoned sailors grumbling. For some members of the research team, seasickness was an ongoing concern best managed with fresh air and a focus on the horizon—or by riding out the worst of it while tucked into bed.

Bad wind and waves also made the mission challenging: Tasked with recovering thirty instruments between Astoria, Oregon, and Cape Mendocino, California, Livelybrooks and cochief scientist Anne Trehu of Oregon State University repeatedly reset the ship's course, seeking windows of opportunity where the weather would subside long enough to allow a team to safely deploy the ROV.

A TEAM OF THREE WORKING IN A CONTROL ROOM ON THE SHIP GUIDED THE ROV'S MOVEMENTS WITH A JOYSTICK, SENDING IT AS DEEP AS 7,800 FEET.

JOYSTICK DRIVEN

During these dives, a team of three working in a control room on the ship guided the ROV's movements with a joystick, sending it as deep as 7,800 feet in search of instruments that had been recording vibrations of the ocean floor for more than a year. With Jason's cameras delivering its "view" back to screens in the control room, pilots could move the ROV straight to the devices while observers were treated to rare looks at the ocean floor and marine life.

Upon finding a seismometer, the team would send Jason to collect a device just dropped into that area from the ship—a refrigerator-sized "elevator" used to recover the instrument. After the ROV had attached a line from the elevator to the seismometer, a signal from the ship would send the buoyant elevator hurtling to the surface, where the other end of the line was attached to a crane that would then lift the 1,600-pound seismometer onboard.

It was like an elaborate video game played with equipment costing millions of dollars: Using the joystick, the pilot had to manipulate Jason's huge mechanical arms and pincer-like grapplers to attach a chain to the seismometer and fasten it by screwing a bolt into a shackle. "Like threading a needle with boxing gloves on," as one person described it.

A demanding operation under the best of conditions, Jason dives were off the table when the seas were rough and the deck crew and the equipment were at risk. That said, the research team recovered all thirty seismometers.

"Jason to the rescue!" Livelybrooks exclaimed after one particularly challenging recovery. "These guys are total pros, I tell you."

DATA FREELY AVAILABLE

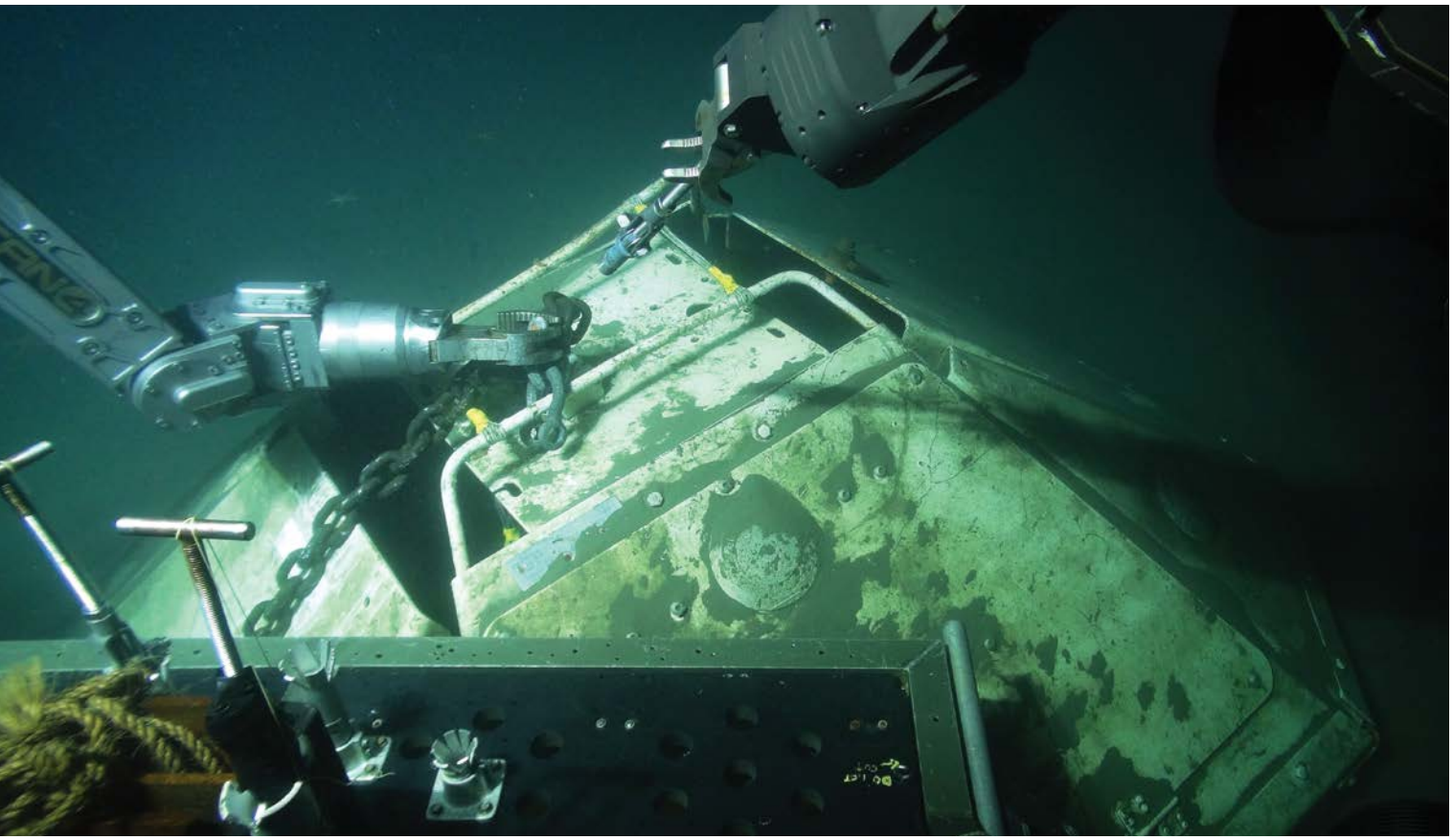
The use of data in the earthquake project promises to be as interesting as the efforts taken to collect it.

Right: Like threading a needle with boxing gloves on—in this underwater image shot from Jason, a remotely operated vehicle, an operator on* Atlantis *maneuvers the ROV's manipulator arms to screw a bolt into a shackle on a shield that is covering an ocean-bottom seismometer. The OBS and the shield, called a "trawl resistant mount," can then be lifted onto the ship.

LIFE AT SEA

Left to right: The crew's interactions with marine life included starfish, dolphins and a lingcod; geophysicist Dean Livelybrooks, with student; the view inside the ROV control room

PHOTOS OF ROV'S ARMS (TOP RIGHT) AND LINGCOD (RIGHT) COURTESY OF NSF, ONR, OREGON STATE UNIVERSITY/ANNE TREHU, UNIVERSITY OF OREGON/DEAN LIVELYBROOKS/ROV JASON 2013 ©WOODS HOLE OCEANOGRAPHIC INSTITUTION; ALL OTHERS BY MATT COOPER



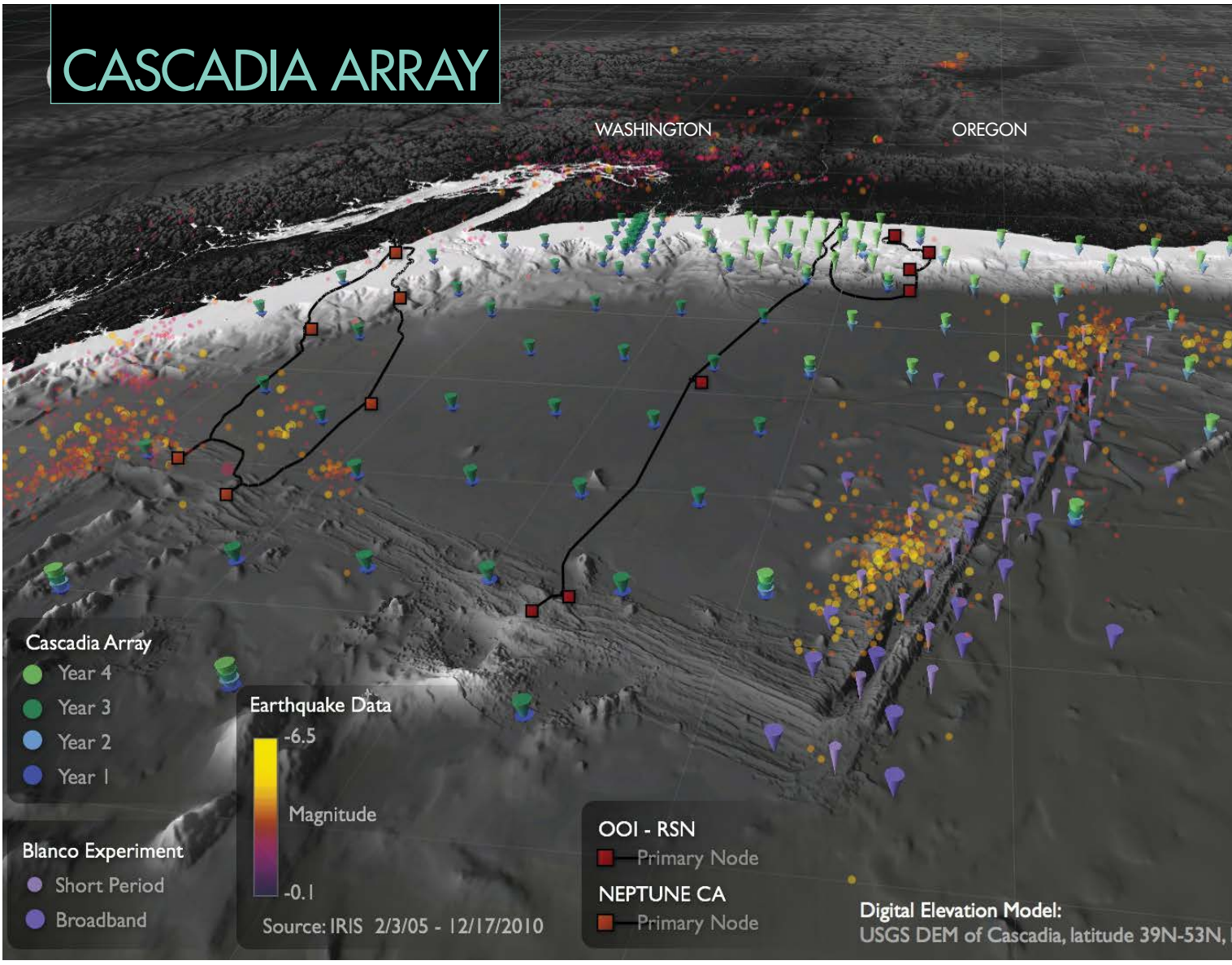
Most research projects are dog-eat-dog. Scientists are inclined to withhold the information they collect for a year or more, lest someone beat them to a breakthrough and publish findings in this intensely competitive environment.

But the Cascadia Initiative is different.

Recordings of vibrations collected from the instruments are made quickly and freely available on the Internet (once they have been scrubbed by the U.S. Navy to protect submarine movements). The project was developed as a true community experiment—serving anyone who wants to use the data—which was imperative in securing the public dollars necessary to carry it out.

The project combines the collection of onshore and offshore data. Using monitors based along the shoreline, scientists will be able to study large earthquakes and almost imperceptibly small ones in real time. Meanwhile, data from ocean-bottom seismometers will, for the first time, provide scientists with images of the physical properties of the tectonic plates offshore that are being slowly forced under the continent.

That data will be used to develop a three-dimensional model of the Cascadia subduction zone, to depths of several hundred miles. It's like taking an MRI of the vast, unstable ocean floor between Canada and California—using seismic waves instead of radio waves—and nothing like it has ever been done before.



Cascadia, a federally funded initiative on earthquake risk in the Pacific Northwest, hinges on data collected by instruments at spots on and off the coast of Washington, Oregon and California. This image shows the amphibious array between Vancouver Island and northern California, and extending from the high Cascades to roughly 350 miles off the coast. This region includes the major metropolitan areas of the Pacific Northwest (Victoria, Vancouver, Seattle and Portland) and numerous smaller coastal and near coastal cities.

With a better picture of the subduction zone, officials will have more information to evaluate risk and assist mitigation efforts such as building-code standards and evacuation routes.

THE EARTH'S HUM

But geophysicists aren't the only ones who benefit from the results. The data will serve researchers studying topics ranging from earthquakes, tsunamis and landslides to seafloor processes and the behavior of marine mammals.

Because the instruments are equipped with devices called "absolute pressure gauges," Doug Luther, an oceanography professor at the University of Hawaii, will be able to analyze rare data on pressure variations at the bottom of the ocean.

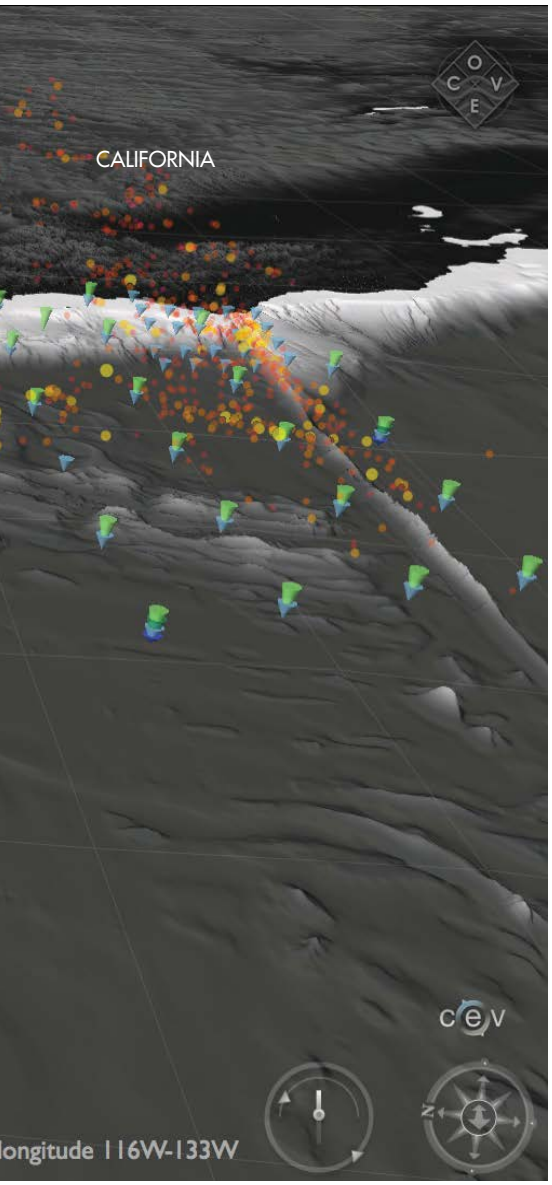
That will aid in the understanding of phenomena such as "infragravity waves" and the flow of cold water and nutrients across the continental slope. Infragravity waves, which differ from normal oceanic waves because they aren't created by wind acting on the surface of the sea, generate seismic tremors described by scientists as "the earth's hum"; the flow of cold water and nutrients plays important roles for local fisheries and climate variability.

"When the Cascadia Initiative was first being discussed, I was just bouncing out of my seat," Luther said, when he realized,"You could use this for oceanography, too!"

Kelin Wang, a research scientist who develops computer models of earthquake systems for the Geological Survey of Canada, said the project will enable him to look deeper into the earth's crust than ever before. "When you a have a large enough network of instruments, it's like a telescope looking into the ground," he said. "You see better."

The data will even contribute to an understanding of some of the world's largest mammals: endangered blue and fin whales.

Both whales call in frequencies recorded by the seismometers. William Wilcock, professor and associate director with the School of Oceanography at the University



NEPTUNE-US PROGRAM AT THE UNIVERSITY OF WASHINGTON AND THE CENTER FOR ENVIRONMENTAL VISUALIZATION (CEV)

of Washington, will use that information to study whale migration patterns and other behaviors.

A fin whale could easily cross an ocean for a meal—following one, therefore, is no small task. "The neat thing about the Cascadia Initiative," Wilcock said, "is that it covers an area of about 1,000 kilometers along the coast and 300 or 400 kilometers off the shore. We'll be in a much better position to see migratory patterns and where the whales are when they're calling. You can potentially monitor a single whale for days."

The Navy is expected to take an interest in funding such research, given its obligation to consider how its operations affect—and are affected by—whale movements.

Said Wilcock: "When you get these big data sets, you can do stuff with them that you haven't imagined." CAS

RARE EXPERIENCE ON A RESEARCH VESSEL PROMOTES STUDENT INTEREST IN SCIENCE

EACH YEAR, about one million U.S. high school freshmen declare interest in a field related to science, technology, engineering or math (also known as STEM fields)—more than one in four. But by the time they graduate, more than half lose interest in a STEM career.

Dean Livelybrooks is helping to reverse that trend. The UO geophysicist is part of a national effort to feed the nation's growing need for scientists and engineers by promoting STEM careers among students in K–12 schools and community colleges. For five years, he has run a program that brings twenty to thirty community college students to the UO each summer to get hands-on experience working in research.

MATT COOPER

Last year was also the third year that Livelybrooks found space for community college students on research vessels in the Cascadia Initiative, under the CC@Sea program. The students work with earthquake data, seismology equipment and telecommunications efforts, all under the eyes of experts in those fields.

"There are a lot of people in community college who have never really met a scientist or engineer and don't know what those jobs are like," Livelybrooks said during an interview on the ship. "Out here, they're witnessing lots of scientists and engineers in action and working as a team. They'll be able to go back to their institutions and say, 'This is what we did out on the *Atlantis*.'"

"My hope," he added, "is that this experience will not only inspire them to go further with science, but also serve to inspire their peers to consider careers as scientists and engineers."

Education and outreach are fundamental objectives of the earthquake initiative, and students on the *Atlantis* enjoyed a rare opportunity to be active participants in reaching out to others. They conducted live broadcasts of the ship's research missions through a program that reaches more than 1.5 million students and teachers around the world.

Ocean Exploration Trust, which engages educators and students in ocean exploration, was founded by Robert Ballard, an oceanography professor at the University of Rhode Island who, in 1985, discovered the wreck of the *Titanic*. Under the program, students on research vessels in Ballard's fleet are connected, by satellite, to audiences in marinas, theaters and other venues; students on the *Atlantis*, for example, narrated the play-by-play of dives by Jason, the ship's remotely operated vehicle (ROV), as a camera attached to the robot displayed underwater images on a screen.

During a recent *Atlantis* trip, Jonás Cervantes of Linn-Benton Community College (above, right, with colleague Haley Domer), discovered an aptitude for telecommunications. The physics major helped work out the technological bugs in broadcasting live from the Pacific Ocean, and he seemed as comfortable in front of the camera as behind it; Cervantes shot other students as they described the action and also provided commentary himself.

As a member of a Linn-Benton team that distinguished itself at an international competition to build an ROV, Cervantes jumped at the chance to join the *Atlantis* mission and see an ROV up close and personal. He plans to use the experience to encourage his peers to get interested in STEM careers.

"I've always wondered how research is actually carried out in the field," Cervantes said, during a break from one of his shifts as a watchstander on the ship. "It's fun; I really enjoy it. One of my main goals is to get more people interested in science." —MC

BY MATT COOPER AND LISA RALEIGH

Human

What does it mean to be resilient? A psychologist might say it's the ability to spring back from adversity or loss, to thrive despite setbacks that seem insurmountable. Communities can be said to be resilient in their response to disaster. Even businesses can be viewed as resilient, evolving with changing market conditions that might cause less nimble competitors to close their doors.

And then there's large-scale human resilience in the face of environmental change.

In this instance, resilience refers to our ability to reassess—and if necessary, adapt—our long-held values, assumptions and habits (like fossil fuel consumption) that may require rethinking and re-envisioning in the interest of sustaining life on the planet.

This topic is of central concern to Stephanie LeMenager, a new professor of English at the UO and a self-proclaimed "environmental humanist."

LeMenager founded and edits a journal called *Resilience*, a forum for experts in literature, art, philosophy and many other humanistic fields "to plot out an evolving conversation about what the humanities contributes to living and thinking sustainably in a world of dwindling resources." She was hired as the new Barbara K. and Carlisle Moore Distinguished Professor in English, a prestigious appointment that underscores her stature.

LeMenager

LeMenager's arrival, meanwhile, builds on the UO's ongoing commitment to the role the humanities play in grappling with environmental issues.

According to Alan Dickman, director of the Environmental Studies Program, "The humanities force us to ask, 'What are the important questions? How did we get here? What's important to us?'"

This line of inquiry is essential for framing the big environmental issues and pursuing viable solutions. "Those are fundamental questions for scientists to ask to do their work properly," Dickman said. "The humanities help identify the questions—they make the science matter."

For more than twenty years, the UO has been home to a thriving interdisciplinary Environmental Studies Program that all along has urged students to consider the human element behind the science and policy related to environmental change.

How do human traditions, belief systems and philosophical and aesthetic values define how we think about the natural world? How do works of art express and even influence the ways we view and consume natural resources like, say, water and forestland? What can the humanities tell us about where our points of resistance will be when faced with the realities of the future, like diminishing energy sources?

"The environmental humanities bring together philosophers, writers, literary critics, historians, performers and artists to explore and explain the connections between humans and the natural world in different cultures, places and times," said Judith Baskin, associate dean of humanities. "This kind of intellectual synergy is what a world-class university is all about."

Universities everywhere are expanding their environmental programs to incorporate this humanistic approach, but the UO has long been a leader in this regard—and is again leading the way nationally with new hires such as LeMenager, as well as increased outreach through events, journals and websites.

In the 1970s, English professors Glen Love, William Rossi, Suzanne Clark and Louise "Molly" Westling began teaching environmental approaches to literature and developing research and teaching in ecocriticism. "We recognized that we have to adjust to a new world," said Westling, a professor emerita. "The humanities are essential to understanding how we must adapt to our new reality."

With this existing body of expertise, it was only natural that when the UO introduced a program in environmental studies in the 1980s, it encouraged undergraduates to study not just the natural and social sciences pertaining to environmental issues, but the humanities as well. This immediately distinguished the UO's program, Westling said.

Fast forward to 2003, when the UO launched its first official recruitment effort for a dedicated "environmental humanist" faculty member and hired philosopher Ted Toadvine. Now head of the philosophy department, Toadvine specializes in environmental philosophy and the philosophy of nature.

When he arrived, Toadvine found colleagues across disciplines eager to collaborate on courses that combine the sciences and humanities. With biology professor Brendan Bohannan, for example, he teaches a course on the philosophy of ecology, which delves into questions such as the ethics of biodiversity.

Thanks to the collaborative spirit of Toadvine and Bohannan, this has been a true marriage of two fields seemingly at opposite ends of the academic spectrum.

"We did not want it to be two disciplines just stuck together," Toadvine said. "Brendan insisted that we both be involved with all classes, together, and model conversations for students. We picked texts that brought out the philosophical difficulties with ecology as a science. We wanted students to ask, 'What are the strengths of the scientific approach, and what are the limits?'"

The emphasis isn't on solving the big problems of ecology—it's on asking the right questions. "We don't give our students the answer at the end of the day," Toadvine said. "Because we don't know the answer."

Framing thought-provoking questions is also the special prerogative of graduate students. A glimpse into the humanistic questions they are pursuing can be gleaned from the profiles of

Nature

current environmental studies doctoral students. (Each PhD student in the program names a "focal department" and half of this year's doctoral students have named a humanities department.) A sampling of interests from those who identify English as their focal department:

- Erica Elliott is exploring "the environmental and ethical implications of converting former nuclear sites into wildlife refuges."
- Shane Hall is interested in the ways environmental issues are "identified, misidentified, or not identified, and portrayed in the mass media and literature," and also "the effects of so-called eco-tourism on the global south, and sustainable development."
- Taylor McHolm (mentored by LeMenager) is focused on "Western American literature and literature of the American West, and its overlap with policy and cultural conceptions of these environments."

As McHolm's area of interest suggests, his research crosses boundaries across both the humanities and social sciences. "It's a requirement that we talk to people [across disciplines] in really significant ways in order to get our PhD," he said. "The fact that that is championed by the university is really big."

Part of LeMenager's charge will be to more fully develop the university's program for graduate students like McHolm, and also for the hundreds of undergraduates majoring in environmental studies. "I want to get people in the humanities excited about applying their skills to practical ends for the environment," she said. CAS

THE BOOK OF GENESIS, CHEROKEE CREATION STORIES AND *LES MISERABLES*

The Environmental Studies Program is a magnet for students. Currently, 500 students are majoring in environmental studies (for a bachelor of arts), or environmental science (for a bachelor of science), adding up to one of the most popular undergraduate fields on the UO campus.

Those who pursue the BA track focus more intensively on social science fields such as geography and political science, as well as the humanities. It takes a village to support students in this track—in addition to English and philosophy professors, faculty members from other disciplines support the BA option (political science, geography, history, etc.).

All students in this track begin their humanistic inquiry with a course called Introduction to Environmental Studies: Humanities.

A glance at the syllabus reveals how literature, philosophy and religious studies directly intersect with environmental issues. Readings range from religious sources such as the Book of Genesis and writings by Saint Francis of Assisi to contemporary Native American writers such as Winona LaDuke. Students read foundational philosophical texts from Plato, Aristotle and Descartes and also examine Cherokee creation stories.

They ponder numerous wilderness writers and learn about "urban ecology" by reading Victor Hugo's *Les Miserables*. They explore the importance of place through poet Gary Snyder.

In their discussions and explorations in this course, they apply the humanist perspective to topics such as wilderness preservation, the Pacific Northwest salmon crisis and global climate collapse, among other current issues.

> "THE ENVIRONMENTAL HUMANITIES HELP US TO ASK THE RIGHT QUESTIONS."

Other courses in the humanities track include upper-division offerings such as Literature and the Environment and Global Justice. The former, an English course, ranges from critical animal studies and food culture to the "rhetoric of nature writing"; the latter, in philosophy, addresses large-scale, absolute poverty and what should be done about it.

"Science is good at asking and answering some questions, but it's not so good at identifying whether we're asking the right questions," said Alan Dickman, director of the Environmental Studies Program. "The environmental humanities help us to ask the right questions." —LR

LIVING IN THE MATERIAL WORLD

THEY ROSE AT 6 a.m. each day, ate breakfast together and started digging by 7. They worked under a relentless sun—staying hydrated was key—but evenings brought relief and the promise of delicious dinners cooked by a Sicilian *nonna*, or grandmother.

Throughout this month-long excavation last summer in Sicily, archaeologist Alex Walthall—a new faculty member in the UO Department of Classics—pressed his students to think like detectives and formulate credible theories for interpreting the artifacts they unearthed. When, for example, an excavation revealed large ruts in the ground underneath, a debate ensued over whether the marks had been left by recent plowing or the wheels of a wagon pushed through the city more than two thousand years ago.

Connecting to the ancient world encourages students to consider how people live today, Walthall said. And it develops skills that will serve them regardless of what they do next.

"There's an element of critical thinking and communicating clearly in this kind of archaeological setting, and it's the best team-building, confidence-building situation that I've ever been in," Walthall said. "We have Morgantina alumni who are now at huge financial institutions, who are professors, museum curators, artists and web developers. These are skills that are transferable."

Walthall has worked for 10 years with major excavations at this site in east-central Sicily, called Morgantina. And with his arrival as an assistant professor in the classics department, his access to this important archaeological resource is now available to all UO students, as well.

Walthall's expertise as an archaeologist complements the work of his colleagues in

PHOTOS COURTESY ALEX WALTHALL

classics. While the other faculty members in the department cultivate an understanding of the ancient world through texts and language, Walthall's vehicle is "material culture"—the relationship between artifacts and society.

"We have this very inclusive and broad approach that we can offer students," he said. "If they want to understand ancient Rome they can read the Latin authors with professors Lowell Bowditch and Mary Jaeger or study Roman art with professor Jeffrey Hurwit. And they can look at Roman material culture—everyday objects from cities, countrysides, landscapes—with me."

Last June, Walthall directed the first season of a multi-year research and excavation project at Morgantina focused on tracing developments that occurred in this urban center between the third and first centuries BCE. As field director, he is exploring the impact of agricultural taxation on trade and local economies in the ancient world, among other topics.

Walthall can produce far-reaching observations about historic societies through analysis of the smallest of artifacts. His research into an inscription on a 2,000-year-old piece of terracotta less than two inches tall, for example, provided rare material evidence of King Hieron II's powerful taxation system and the inclusion of Morgantina within this system.

Aside from the innumerable treasures to be discovered there, Morgantina is valuable because of the comparative safety it offers students (and the parents who will send them abroad). Many of the world's archaeologically rich sites are in volatile countries such as Syria, Egypt and Lebanon.

Just as important, though, is how Walthall runs his digs: Prizing a truly collaborative approach, he brings together experts from all facets of archaeology and students from universities around the country, creating an environment in which everyone's input is valued and equality is the guiding principle. It has been said of Walthall that he won't ask students to complete tasks that he can do himself.

"He really takes care of us," said Jasmine Kim, a UO classics major from Silverton, Oregon, who worked at Morgantina with Walthall last June. "I was quite nervous being the only one from the University of Oregon and the youngest one there. He really put me at ease and made this whole situation seem doable, and once I got there and got over my nerves, it was quite enjoyable." —MC

Immortal Beloved

> "THE DEATH OF A BEAUTIFUL WOMAN IS UNQUESTIONABLY THE MOST POETICAL TOPIC IN THE WORLD."
>
> —EDGAR ALLAN POE

THIS SHOCKING SENTIMENT is perhaps not so shocking, considering the source. Who better than Poe, the master of macabre storytelling, to ponder—in characteristically creepy fashion—the intersection of beauty, death and poetic expression?

But the beauty of the dead woman is not the romanticized obsession of a lone nineteenth-century writer. This is made clear in the syllabus to a new lower-division course called Living Dead Girls, to be offered for the first time this winter by the Department of Comparative Literature.

Developed and taught by graduate student Rachel Eccleston, the course invites students to examine tales of dead girls throughout the centuries, starting with the Renaissance poet Petrarch and his immortalization of the lovely, deceased Laura to the twenty-first century novel *The Lovely Bones*, in which a dead teenager narrates her own story.

Along the way, other readings will range from Poe and his dead love objects such as Annabelle Lee (his wife Virginia, above, was said to be his inspiration) to critiques of the television series *Twin Peaks*, which centers around another dead Laura and the murder-mystery theme: "Who killed Laura Palmer?"

Eccleston is intrigued by the fact that the literary motif of the deceased young woman persists over time and well into our modern age. Yet she points out that the "agency" of the dead girl has transformed over the centuries. By this she means that deceased women in literature of the past were more commonly memorialized in rhapsodic tones by male admirers, with no voice of their own.

"The idea that women are most beautiful when they're dead is so disturbing in so many ways," said Eccleston. "The implication is that they are most beautiful when they are silent, mute and ineffective."

But modern dead girls are more often in charge of their own narratives—like the teenager in *The Lovely Bones*. To a lesser extent, Laura Palmer in *Twin Peaks* gets her own voice in the afterlife when a cousin who looks just like her (played by the same actress) appears on the scene.

Eccleston also includes in her syllabus "living dead" examples such as *The Dybbuk*, a 1914 play in which a young bride is possessed by an evil spirit, causing her to act like a man (i.e., like someone who has more agency, or autonomy) and "Lady Lazurus," a poem by Sylvia Plath, narrated by a reluctant survivor of near-death experiences who vows to prevail over her oppressors in the end. A Spanish story from the Renaissance era, "La Inocencia Castigada," concerns a young woman who is turned into a sex-seeking zombie and then punished by her family, but who ultimately attains freedom and justice.

Eccleston particularly likes to include texts from centuries past because they can be a surprising revelation for undergraduates. "They assume that because a text is old, it's boring. But they get to discover that it can actually be quite modern." —LR

LOSING A LANGUAGE AND REGAINING IT

By the time she was 25, Anna Mikhaylova spoke English as well as her native language, Russian. She was so fluent in English, in fact, that she instructed fellow Russians at a university how to teach it.

ARABIC E-BOOK EXPANDS LANGUAGE EXPERIENCE

ANTAR AND ABLA (right) are the real-life Romeo and Juliet of Arabic history. He was a poet and slave who fell in love with his cousin; he earned her hand by completing challenges that included obtaining a camel from a distant kingdom. Antar's saga has been preserved through the ages by storytellers in Arab coffeehouses; symphonies have been based on his legend and one of the seven historic Arabic tribes was named for him.

The story of Antar and Abla is rich with historical and cultural references, making it just the kind of colorful material you might expect to find well-documented in Arabic textbooks. But the textbooks used overwhelmingly at universities across the U.S. give comparatively little attention to culture and history, instead dealing almost exclusively with language, grammar and vocabulary, say two Arabic language instructors at the UO.

Rana Mikati and Hanan Mohammad Hassan Ahmad have set about changing the status quo. They're developing an electronic, interactive "e-book" that will supplement language-oriented textbooks at the UO with material that covers the political and historical background of the Middle East, customs and traditions, celebrations, literature—even cooking.

"When you learn any language, you have to learn about the culture," said Ahmad, coordinator of the Arabic studies program. "Culture is so integrated into the language, and vice versa. You have to have the background; you have to know what to do with those words you're learning."

Ahmad's research includes media coverage

ENGLISH CAME SO easily to Mikhaylova that, while speaking in Russian with friends and colleagues, she would sometimes inadvertently resort to it for certain words, like "exit." This phenomenon, common among bilingual speakers, is called code-switching: switching back and forth between languages to find the right word or phrase to express a thought. There is no Russian equivalent for "exit" to describe a highway off-ramp, for example.

Mikhaylova was fascinated by this wrinkle in her bilingual dexterity. "I didn't feel like I was losing my Russian, necessarily, but I felt that I somehow wasn't as fluent, either," she said. "I wasn't sure if that was a good or bad thing. Taking linguistics classes opened my eyes to learning that code-switching was normal."

This observation motivated Mikhaylova—a new assistant professor of linguistics at the UO—to explore the "normal" of language acquisition, in general. In her research, she studies factors such as the age when a second language is acquired and sociocultural influences like economic status. How do these factors affect one's ability to learn a language?

Born and raised in Ryazan, an ancient city 120 miles southeast of Moscow, Mikhaylova began studying English as a second-grader. She later spent 10 months in New Jersey on a high-school cultural exchange program (where she was introduced to the "Joisey" accent, she laughed). She earned bachelor's and master's degrees from Ryazan State University and a master's in English from East Carolina University; her Ph.D. in linguistics is from the University of South Carolina.

Throughout her education, Mikhaylova was struck by the plight of families who lose the ability to communicate in their native tongue when they are transplanted into other cultures—for instance when the children of Russian immigrants can no longer speak Russian.

These children are part of a group of language learners that intrigues Mikhaylova: "heritage" speakers, who grow up with one language spoken in the home (their heritage language) and another in society at large. These individuals many times acquire two languages simultaneously, but they don't receive formal schooling in their heritage language; as a result, heritage speakers often struggle to read and write in their native tongue, or even to speak it.

"There is a lot of research on heritage speakers of Russian who can't hold complete conversations because they've forgotten the words, and my friends have talked about their kids losing their Russian," Mikhaylova said. "It seemed so sad, and it has inspired my research. I felt it was important."

When heritage speakers enroll at a university like the UO and wish to take classes in the language spoken in their home, they are often unprepared to study the language at a college level. As a result heritage speakers often need to be taught literacy skills, even thought they might be fluent in the spoken language. (At the UO, there is now a specially designed program for heritage speakers of Spanish and a literacy course for Russian heritage speakers.)

Mikhaylova

This contrasts with the challenge of educating students who are studying a second language they didn't grow up with—for instance, native English speakers studying Spanish.

For decades, the method for teaching a second language centered on grammatical rules and vocabulary-building. But research eventually suggested that it was most effective to hear—and speak—a second language every day in conversation rather than learn the rules from a book.

Mikhaylova advocates for finding ways of putting these two groups in conversation with each other—literally. "Heritage speakers have a lot of connections to the language that second-language learners don't have," Mikhaylova said. "You have to create opportunities for both groups to communicate together."

Ultimately, she hopes to inform our understanding of bilingual learning and to improve the teaching of both heritage speakers and second-language learners. She can also envision improvements at the policy level.

"Students have been punished for speaking their native language in the classroom and when a native language is used in the workplace people wonder if that is good or bad," Mikhaylova said. "I hope that my work will help policy makers view bilinguals as multi-competent, rather than incompetent speakers of one or both of their languages." —MC

of the U.S. invasion of Iraq in 2003, as well as the pedagogy of teaching Arabic as a foreign language, and its translation and interpretation. Mikati specializes in Islamic history; she has taught modern standard Arabic and Levantine Arabic languages. At the UO she teaches beginning and third-year Arabic.

Their e-book proposal was one of five projects recently awarded funding from the UO's Tom and Carol Williams Fund for Undergraduate Education. The e-book, which will be available to UO students in Arabic courses later this year, covers the geography of Arabic countries, family organization, culinary traditions, music, cinema, media, religious identities, feminism and gender, literature, politics and poetry. Mikati and Ahmad will play to the strengths of electronic, online media by incorporating PowerPoint presentations, audio and video.

"Students taking the Arabic language course sequences at the intermediate and advanced levels are looking for more than language," Mikati said. "They're interested in comparative literature, journalism, history, religious and international studies. This e-book will support them as they pursue their own academic and scholarly interests." —MC

THE FIRST CLASS OF MORSE SCHOLARS TO TACKLE "DEMOCRATIC DILEMMAS"

AN INTELLECTUAL NEIGHBORHOOD FOR POLITICALLY SAVVY UNDERGRADS

DAN TICHENOR was walking to his office after class one day with a student from San Francisco. As they talked, she illuminated for him the difference between small liberal arts colleges and public research universities; it's similar, she explained, to the contrast between towns and cities.

"Cities have almost everything you could want, but they can be too big and impersonal if you don't find a neighborhood you love," she told him. "Same thing here. You need an intellectual neighborhood to call your own."

Last fall, Tichenor began creating exactly such an intellectual neighborhood—a community of scholars—for UO undergraduates who wish to study public affairs and American politics from practical, analytical and ethical perspectives.

In November, he selected the first class of Wayne Morse Scholars, twenty-two hand-picked sophomores and juniors who will enjoy an intensive, hands-on learning environment while studying complex issues in government and politics.

Tichenor recruited academically talented students who are involved in politics or activism, many of them majoring in political science. However, others are majoring (or double-majoring) in a wide array of fields: anthropology, economics, environmental studies, ethnic studies, folklore, German, history, international studies, mathematics, philosophy, sociology, Spanish, theater arts and planning, public policy and management.

The common thread: motivated and gifted students who care about public service, the impact of the policy-making process or both.

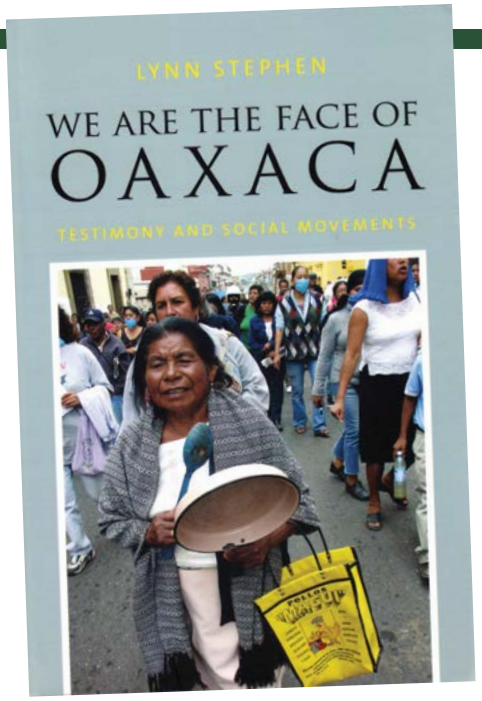
"This is an exciting mix of students with outstanding academic credentials and impressive leadership and service experience," Tichenor said.

The Wayne Morse Scholars Program is designed to carve out for each of these undergraduate students an intimate environment of specialized learning and research—as well as practical experience—that takes advantage of the broader resources of a major public research university.

Tichenor, a political science professor whose expertise includes the politics of immigration and presidential power, is also senior faculty fellow at the Wayne Morse Center for Law and Politics. He was recruited in 2007 as a Philip H. Knight Professor of Social Science and was recently named Philip H. Knight Chair of Social Science.

The Wayne Morse Center, named for Oregon's former U.S. senator, is housed at the UO's School of Law; it brings together scholars and activists to discuss critical topics in the tradition of Senator Morse. For years, the center has run successful fellowship programs for law and PhD students, but this will be the first program that specifically focuses on undergraduates.

During their first year as Wayne Morse Scholars, students will take a seminar course



CITIZEN TESTIMONY

WHEN UO ANTHROPOLOGIST Lynn Stephen traveled to Oaxaca, Mexico, in summer 2006 with a research team of UO students and faculty members, she did not know she would be arriving in the middle of a social uprising.

"The atmosphere was electric with hope, fear, joy, sadness, violence, repression, and amazing acts of courage, humility, and cooperation all at once," Stephen recalls in her new book, *We Are the Face of Oaxaca: Testimony and Social Movements*, published in September 2013 by Duke University Press.

Starting in June 2006, the emergence of the Popular Assembly of the Peoples of Oaxaca (APPO), a coalition of more than 300 organizations, disrupted the Oaxacan government for six months. APPO took over state-run radio and TV stations and initiated a participatory political vision for the state.

Arriving in the midst of this social upheaval, Stephen, director of the UO Center for Latino and Latin American Studies and College of Arts and Sciences Distinguished Professor, shifted from her original project in Oaxaca. Her intent had

that Tichenor has tailored especially for them. Called Democratic Dilemmas, it tackles tough political and policy issues.

In this class, students will role-play the part of lawmakers tasked with challenges such as balancing the federal budget or deciding the future of the Oregon Public Employees Retirement System. Or they may sit in the Oval Office weighing national security issues against privacy rights. Or sit on a jury deciding a pivotal case.

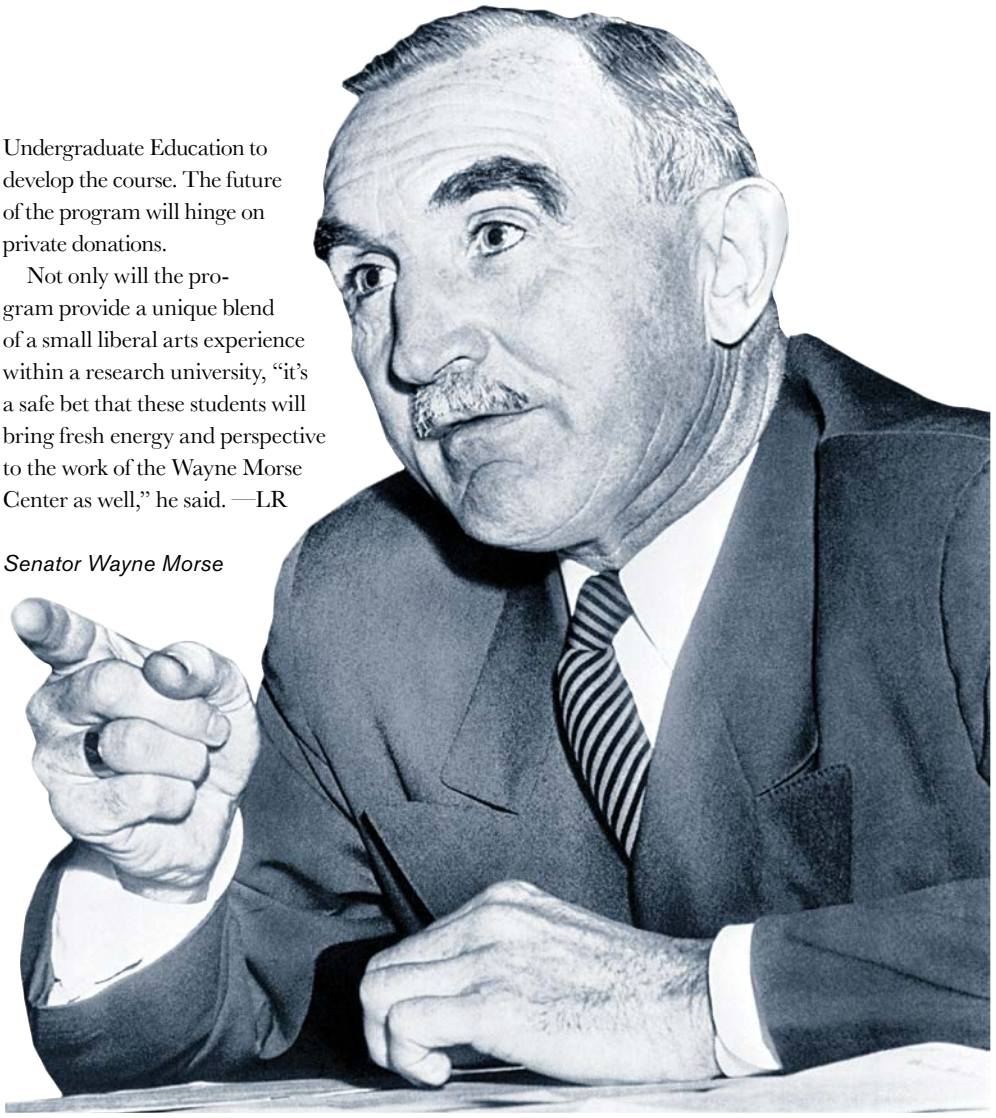
Tichenor will also invite policymakers into the classroom for direct discussion with students.

A key aspect of the program is leadership training, which will prepare students for second-year internships in settings such as U.S. Senator Jeff Merkley's office. During their second year, students will also have the option to pursue independent research toward an honors distinction in political science.

A bonus for both first- and second-year students: Through the Wayne Morse Center's "Food for Thought" gatherings, students will meet with an impressive lineup of distinguished speakers, government officials, scholars and political practitioners who routinely visit the center. Students will also travel to Salem to observe the Oregon House, Senate, Supreme Court and executive branch at work.

Tichenor received a 2013–14 grant from the Tom and Carol Williams Fund for Undergraduate Education to develop the course. The future of the program will hinge on private donations.

Not only will the program provide a unique blend of a small liberal arts experience within a research university, "it's a safe bet that these students will bring fresh energy and perspective to the work of the Wayne Morse Center as well," he said. —LR



Senator Wayne Morse

COURTESY OF THE WAYNE MORSE CENTER FOR LAW AND POLITICS

> "WE ARE WOMEN WHO DON'T USUALLY HAVE A VOICE BECAUSE WE ARE BROWN, WE ARE SHORT, WE ARE FAT, AND THEY THINK THAT WE DON'T REPRESENT THE PEOPLE, BUT WE DO. WE ARE THE FACE OF OAXACA."
>
> — FROM THE TESTIMONIAL OF A OAXACAN WOMAN

been to film indigenous cultural activities for a course she intended to coteach at the UO with Mixtec community outreach workers, but she was soon inspired to deploy the tools of her profession (video camera, audio recorder and notebook) to capture the testimonies of ordinary Oaxacans affected by the uprising.

Her purpose became "to share the untold story of the 2006 social movement as experienced by those who participated in it," she explains in the introduction to her book.

Testimonials were already being broadcast on radio and television stations appropriated by the APPO, shared at public demonstrations, debated in homes and in the streets and disseminated around the world via the Internet.

Stephen immersed herself in these narratives, first gathering testimonials for a website that included video and audio interviews. But she soon realized the value in enlarging the scope of the project to what ultimately became a book project—but not a book alone.

Stephen's book is the first of its kind published by Duke, in that it integrates digital video and photographic content; it is published in both paper and e-book formats—with a website (faceofoaxaca.uoregon.edu) of accompanying digital material created and hosted by the University of Oregon Libraries and directly accessible through links in the e-book.

As reviewer Sally Engle Merry wrote, "The book and its website with recordings provide a wonderful opportunity to hear the testimonies of those with courage to speak." —LR

DRINK AND DRIVE?

CONSIDER THE COST-BENEFIT ANALYSIS

IN 2013, the National Transportation Safety Board recommended that states drop the legal limit from 0.08 blood-alcohol content to 0.05. The NTSB believes that lowering the threshold for drunk driving will reduce fatalities.

But Ben Hansen, an assistant professor of economics at the UO, says the federal board can get more mileage, so to speak, by creating clearly articulated, progressively stronger punishments tied to levels of alcohol impairment. This would mirror the way that fines for speeding are more punitive for those driving faster (e.g., if you exceed the speed limit by twenty miles per hour, you'll pay a steeper fine than if you are five miles per hour over the limit).

Yet progressively severe fines and jail sentences for drunk driving would not be enough on their own: The new punishments would have to be publicized far and wide so that potential offenders would be clear about the consequences. That's because drunk drivers who get caught have been shown to make a cost-benefit analysis that prevents many of them from getting behind the wheel again and risking more severe punishment.

Hansen approaches the drunk-driving issue not from a sociological viewpoint, but an economic one, as befits his academic field: He studies factors that influence adolescent and adult risky behavior such as crime. All decision-making, at heart, is a weighing of costs and benefits, he notes.

Hansen, who also studies punishments meted out by the Oregon Youth Authority, is fascinated by crime because he can probe large data sets for decisions and outcomes that are causal, not correlational, in nature. Economists need causal relationships to make accurate projections.

Drunk drivers present a rich vein for investigation, because Hansen can quickly break them out into two groups that are essentially identical—those with blood alcohol levels just over the legal limit (say, 0.081), and those just under it (say, 0.079). The latter population provides Hansen with a ready-made control group and a way to measure the causal relationship between punishment and future behavior.

DRUNK DRIVERS PRESENT A RICH VEIN FOR INVESTIGATION, BECAUSE HANSEN CAN QUICKLY BREAK THEM OUT INTO TWO GROUPS THAT ARE ESSENTIALLY IDENTICAL—THOSE WITH BLOOD ALCOHOL LEVELS JUST OVER THE LEGAL LIMIT, AND THOSE JUST UNDER IT.

In a review of more than 500,000 DUI stops by police in Washington state between 1999 and 2007, Hansen found that drivers who were just over the legal limit were 17 percent less likely to reoffend than those just under it. In other words, a significant proportion of the first group—which suffered the consequences for breaking the law—got smart and decided that the cost of another DUI was too high.

This supports a fundamental economic theory proposed by American economist Gary Stanley Becker: Criminals are rational, assessing the costs and benefits of a future action and deciding accordingly.

In Washington and most states, there is also a little-known second threshold for severely impaired drivers—0.15—that carries even stiffer penalties; Hansen found that drivers just over this threshold were nine percent less likely to reoffend than those just under it.

But why is the aversion to reoffending relatively low in this instance? Based on the data cited above, wouldn't we expect that those receiving more severe punishment would be even more averse to future consequences?

The number is lower because this group faces lower costs, said Hansen. Drivers with blood alcohol content (BAC) just over 0.08 experience two types of costs avoided by drivers just under the threshold: the pain of the punishment and the threat of worse punishment for another offense.

But drivers with BAC just over 0.15 experience only one additional cost, compared to those just under this threshold: the pain of an especially hard punishment. In the future, this group will face the same punishment as those just under the 0.15 threshold (which was punished, but less severely).

In Hansen's view, this points to an economic concept called "bounded rationality"—the idea that our ability to make rational decisions is limited by the amount of information we can collect. Drivers penalized harshly for being severely impaired often lack accurate information on the actual penalties for another offense—their information sources could be as diverse, and flawed, as word-of-mouth, Facebook or TV programs. As a result, they do not have a complete data set that allows them to do an informed cost-benefit risk analysis.

A simple, uniform, easy-to-understand system of incremental punishments—one that spells out the level of fines, jail sentencing or both for specific levels of impairment—would be an important first step for public safety, Hansen said. But making sure that the information is conveyed broadly, in an equally systematic manner, would be just as key, he added.

"Publicity and simplicity are the things that really matter for actually having laws that serve as deterrents," Hansen said. —MC

NONTRADITIONAL STUDENTS, ATHLETES AND MORE FLOCK TO GENERAL SOCIAL SCIENCES

BENJAMIN SLUTZ FOUND his job in sales—to put it bluntly—"soul-crushing."

His colleagues seemed to care mostly about getting people to sign on the dotted line, buying residential or commercial security systems. Empathy for the customer? Ha! Just do what the law allows to get contracts, contracts, contracts. Then you'll get paid.

Slutz loves business but figured there had to be more to it than this. And so, with an associate's degree in hand, the twenty-five-year-old is back in school, charting a course to a career that will satisfy him professionally and personally.

Reuben Zahler hears a story like this almost daily. As director of the new General Social Sciences Program (GSS), Zahler is fast acquainting himself with two very large populations of college students: those who don't fit neatly into a particular department or field, and those—like Slutz—who are on an educational path other than the traditional, four-year model.

Both groups are finding a home in GSS, which the university reintroduced in 2011. Under the program, students tailor their major with courses from several departments across the social sciences and in the professional schools, in pursuit of one of four tracks: applied economics and business; crime, law and society; globalization, environment and policy; or social studies teaching.

With more than 600 majors currently, GSS has quickly become the fourth most-popular major in social sciences, behind economics, sociology and political science. Program coordinator Gretchen Hill, who, with Zahler, interviews each and every student before accepting them into the program, has moved from part-time to full-time to manage the interest.

Senior Kehala Hervey, a double major in GSS and Spanish, is using the program to develop a comprehensive understanding of the criminal justice system. As a GSS major, Hervey has taken classes in political science, law, family and human services and ethnic studies. In combination, these courses offer her a broad view of the function and structure of the justice system as well as on-the-ground perspectives about relevant topics such as race, gender and socioeconomic class.

"There are many social issues that intersect with crime," Hervey said. "The interdisciplinary nature of GSS allows me to investigate these issues through an array of methodological frameworks. The variety offers what a single framework could not—a multifaceted view of a complex subject."

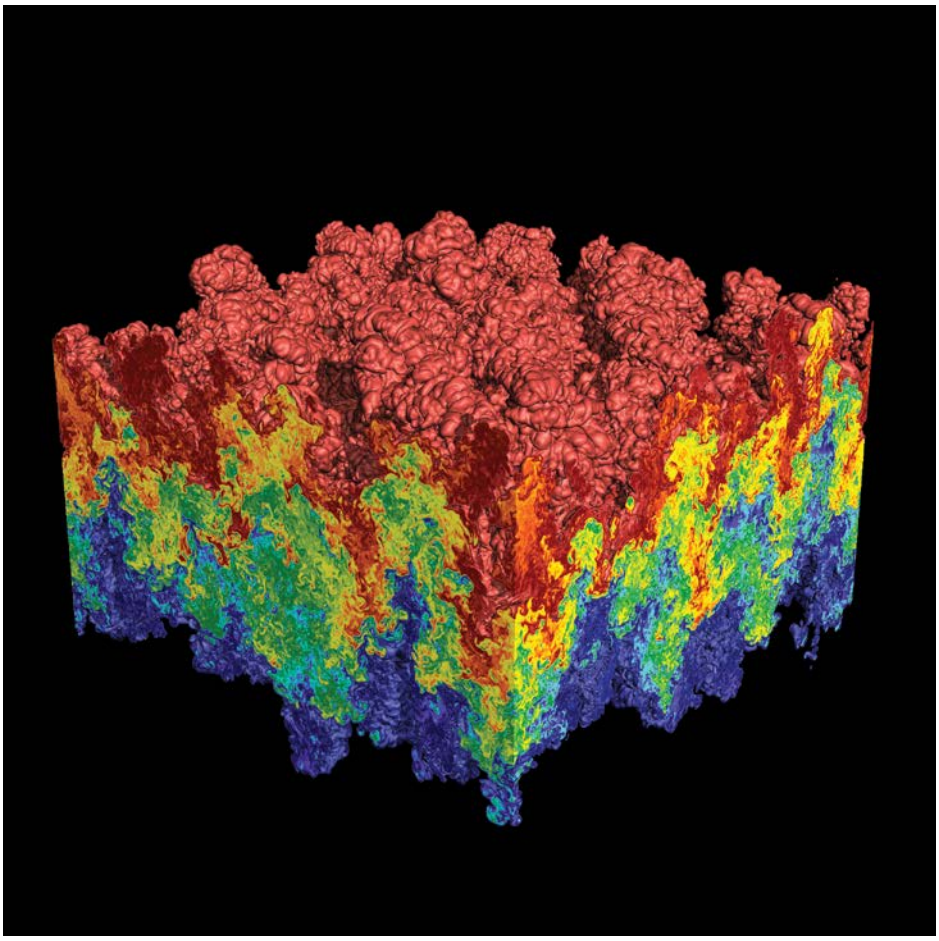
While the average age of a UO senior is twenty-four, the number is slightly higher for GSS seniors, twenty-five. That's a reflection of nontraditional students, many of whom return to school after unsatisfying experiences in the working world or because they want to improve on lackluster performances as undergraduates the first time through.

The vast array of courses in the 48-credit GSS major serves students with atypical schedules or a need to graduate in a timely manner. Student-athletes, for example, seek out the major because it offers numerous courses that fit with practice schedules, Zahler said.

Slutz originally hoped to study business at the UO when he returned, but he doesn't want to spend four years in college. With the GSS major, he'll graduate in two-and-a-half years, concentrating on courses in economics, marketing and finance that get him closer to his goal of one day managing small or medium-sized companies.

"It's exactly what I want to be learning," Slutz said. "You can take the classes you want, you can take them when you want. [The GSS major] is less structured than the other majors on campus, and that allows students like me to build their own studies as they see fit." —MC

BIG QUESTIONS DATA CHALLENGES TO TODAY'S TECHNOLOGY



The big picture: Illustrating how heavy and light fluids mix is a big data question—it requires processing massive amounts of information and displaying the results visually. This is a well-known visualization of a Rayleigh-Taylor instability, created by Hank Childs during his time as a computer scientist at Lawrence Livermore National Laboratory in California. It shows the instability at the mixing interface of a dense fluid, such as water, and a lighter one, such as oil.

WHEN AN EXPLOSION at the Deepwater Horizon oil rig in April 2010 caused crude oil to begin spewing into the Gulf of Mexico at the rate of more than 50,000 barrels per day, scientists faced a monstrous, two-headed question: Where will the oil go? And how do we process all the data needed to answer that and respond?

It was a real-life problem that tapped into big data—data sets so large and complex that they overwhelm conventional computers, presenting hurdles in processing and visualizing information.

Enter Hank Childs, who lives at the crossroads of big data and visualization.

Childs, one of the newest faculty members in the Department of Computer and Information Science, studies supercomputers and the challenges of presenting their results visually. It's anything but a theoretical exercise: As technology advances, it will soon be necessary to handle exabytes of data, each one of which is equal to one quintillion bytes.

The first challenge is trying to process these large data sets. The second is to produce meaningful results—how do we display an exabyte of data? The billions of bytes of information involved in big data problems must be dramatically scaled down to be displayed within the limits of today's technology.

"You only have about a million pixels on the computer screen," Childs said. "For an exabyte, you have to do a billion-to-one reduction of which data points make it onto the screen."

UO departments such as geography have incorporated big data for decades and now Childs' arrival underscores the university's commitment to expanding the analysis and application of these large data sets.

In a recent presentation to UO officials, physics professor Greg Bothun said big data will be a guiding theme for research universities over the next several decades, and many are updating infrastructure accordingly. The UO, for example, plans to develop a system that will display fifty million independent pixels—about fifty times what is commonly used.

"Big data creates opportunities to tackle problems in a fundamentally different way, which may be highly relevant to the world we live in," Bothun said. "We can begin to play in this arena because of some key hires and machine hardware."

The university recently hired alum Kristin Potter ('00, computer and information science), a frequent collaborator with Childs, as a specialist who will work with faculty members to display big data results visually. Childs, meanwhile, was called by Bothun "one of the best and most experienced scientific visualization programmers in the world."

While working for the California-based Lawrence Livermore National Laboratory in 2000, Childs and a team of programmers created a visualization and analysis tool that can run information-heavy simulations and produce comprehensible results without the need to transfer data between a series of desktop computers. They called it VisIt and made it available to the public; it's since been downloaded more than 200,000 times.

VisIt played a key role in developing a better understanding of oil movement in the Gulf. The initial predictions for oil movement were off. Scientists realized that they needed to account for a multitude of variables in real time, including atmospheric and surface ocean currents, water temperature differences and more. VisIt enabled them to understand the simulations necessary to accurately predict oil dispersion.

> THE BILLIONS OF BYTES OF INFORMATION INVOLVED IN BIG DATA PROBLEMS MUST BE DRAMATICALLY SCALED DOWN SO THAT RESULTS CAN BE MEANINGFULLY DISPLAYED.

"VisIt serves as a hub to deliver cutting-edge techniques," Childs said. "In this case, we developed a visualization technique for the nuclear fusion community that ended up being really useful for oceanographers. In the bigger picture, we have developed an infrastructure for handling some of the largest data sets in the world, and it is really exciting to see it be deployed to areas like climate, combustion, astrophysics and many more." —MC

NOW ENTERING THE NEW GENOMIC ERA

Bioinformatics is all about big data. The field brings together experts from biology, computer science and mathematics to collect, analyze, manage—and, yes, visualize—today's tidal wave of biological data.

Consider the impact of technological advancements on DNA sequencing. Sequencing an organism's entire genome once took biologists months to map, but now it can be accomplished in a matter of days.

> TO PREPARE GRADUATES FOR TODAY'S CUTTING-EDGE JOBS THAT APPLY COMPUTER TECHNOLOGY TO BIOLOGICAL INVESTIGATION, THE UO HAS LAUNCHED THE BIOINFORMATICS APPLIED MASTER'S PROGRAM.

These next-generation sequencing methods mean research breakthroughs for everything from determining the genetic factors that influence the way organisms respond to climate change to pinpointing individual mutations in cancerous tumors.

These methods also create new career opportunities. To prepare graduates for today's cutting-edge jobs that apply computer technology to biological investigation, the UO has launched the Bioinformatics Applied Master's Program, designed to meet the needs of industry, the medical field and academic institutions in the new genomic era.

The 54-credit fifteen-month curriculum includes training in all aspects of acquiring and analyzing next-generation sequencing as well as six- to twelve-month paid internships in an industrial, medical or academic setting.

The UO has partnered with companies and institutions to offer internships that range in salary from $2,000 to $3,600 per month and can lead to permanent positions in genomics. Students receive training that benefits both the students and the partners who bring them on board, said Andy Berglund, codirector of the master's program and a professor in the Institute of Molecular Biology.

"Our goal for our partners is to provide potential employees with skill sets that allow them to step in and contribute immediately to bioinformatics research projects," said Berglund.

Adam Struck, a graduate student in chemistry, said he's used his training in bioinformatics to assist labs working with DNA- and/or RNA-sequencing.

"Although many labs are using these technologies, most do not have a designated bioinformaticist to analyze the data," Struck said. "Because of this, I have been able to incorporate the bioinformatics program very well into my PhD training."

The program will also support UO genomics research in other ways, added codirector Bill Cresko, an associate professor of biology.

For example, the UO's new Microbial Ecology and Theory of Animals Center for Systems Biology (META) will use bioinformatics to address the mysteries of genetics and disease through the study of animal-associated microbial communities. This $10.3 million center, funded by the National Institutes of Health, is one of only two such centers awarded recently.

META's work will rely on innovations in sequencing technology and imaging to investigate microbial communities that rely on hosts (such as animals and human beings) and the corresponding host responses.

"The UO bioinformatics program is ushering through a new generation of students who will be highly effective at managing and analyzing big data from next-generation sequencing projects," said Jason Boone, vice president of Eugene-based Floragenex, a program partner that specializes in plant and animal genetic research.

John Letaw, a graduate biology student, counts himself among that new generation—preparing to be competitive for positions in industrial, academic, medical and government laboratories or for admission to graduate and medical schools. He sees career opportunities for people with the scientific and computational skills that the program cultivates.

"There's so much data to be sifted through," Letaw said. "(Bioinformatics) is a burgeoning field and it's one employers are interested in." —MC

NOT SO FAST: CONCUSSIONS AND RECOVERY TIME

BOXERS KNOCKED TO the canvas have ten seconds to get back on their feet. A football player who has had his "bell rung" might get five or ten minutes on the sideline before he's ordered back into the fray. In either of these scenarios, popular medical thinking holds that, longer term, a concussion usually clears up within a week or so.

But last year, the UO's Department of Human Physiology made a stunning find: The ability to focus and switch tasks was compromised for up to two months following brain concussions suffered by high school athletes—much longer than the seven to ten days previously thought.

Through an arrangement with Eugene-area schools, twenty high school athletes who had suffered a concussion—primarily football players but also others from soccer, volleyball and wrestling—were assessed within seventy-two hours of injury and then again one week, two weeks, a month and two months later. Each of the subjects, whose diagnosis was made by a certified athletic trainer or physician, was matched with a healthy control subject of the same sex, body size, age and sport.

Subjects were tested over a two-month period for their ability to respond to auditory cues while walking. The testing took place in the Motion Analysis Laboratory, where researchers use reflective markers on subjects' bodies to create real-time computerized imagery of the subject's movements. A recorded voice played over speakers in the lab said the words "high" or "low," at pitches that were occasionally inconsistent with the word (e.g., a low-pitched voice might say the word "high"). The subject was required to identify the correct pitch, regardless of the word that was heard.

The findings showed that concussed subjects had more difficulty maintaining balance and walking speed while responding to the auditory cues.

Given most concussions can't be seen on an MRI, examining a subject's balance during this kind of "dual-task walking" might assist in assessing the injury and recovering from it, the team said.

"The differences (in response time) we detected may be a matter of milliseconds between a concussed person and a control subject," said lead author David Howell, a graduate student in the department. "But as far as brain time goes, accurately measuring that difference is significant for determining if a linebacker will be returning to competition too soon—which could mean increased risk of another injury."

Howell, along with professor Li-Shan Chou and professor emeritus Louis Osternig, also found that concussions affect the gait of adolescents who are asked to perform basic cognitive tasks while walking.

It's believed to be the first-ever assessment of balance recovery in this high-risk group. Many of the 1.6 million to 3.8 million annual concussions nationwide are sustained by high school athletes, who may be more vulnerable to lasting injury because the frontal regions of the brain are still developing.

Dr. Viviane Ugalde, medical director for the concussion management program at the Bend-based Center Foundation, said the UO research shows that there can be limita-

"MATHLETES" TRANSFORM LIBRARY SPACE INTO STUDY HAVEN

SOPHOMORE LYLA ROEMEN was in the Fenton Hall mathematics library recently to get help with Calculus 251 homework. Every time she got stuck, she flipped over a wooden dowel that was standing on her desk; the dowel was taped on both ends—green representing, "I'm able to keep working on my own," and red, "Help!"

The math library is one of few options available on campus for students seeking free homework help, Roemen said. She spends about twelve hours a week there. "These math classes have a ton of homework," she added. "The aides are really great. Sometimes it takes a while for them to get to you, but when they do, they all know what they're doing."

Perhaps no one better than a struggling math student could have predicted the meteoric popularity of the new math library, which was transformed during a two-year renovation and seismic retrofit of the hall, completed in 2011.

A library that historically saw ten students on a busy day now serves as many as 214, on average, wildly exceeding expectations.

"During a typical term, more than 600 students ask for help with their homework, which is about one in seven students enrolled in lower-division math classes," library manager Lara Nesselroad said. "They return, time and again. They bring their friends. They bring their dinner. They stay for hours, working through homework problems while our student staff members rove to explain concepts or spot errors with them."

As part of the upgrade, the Moursund Reading Room, which houses the library, was converted from a hard-to-find study spot to an open, airy and brightly lit space.

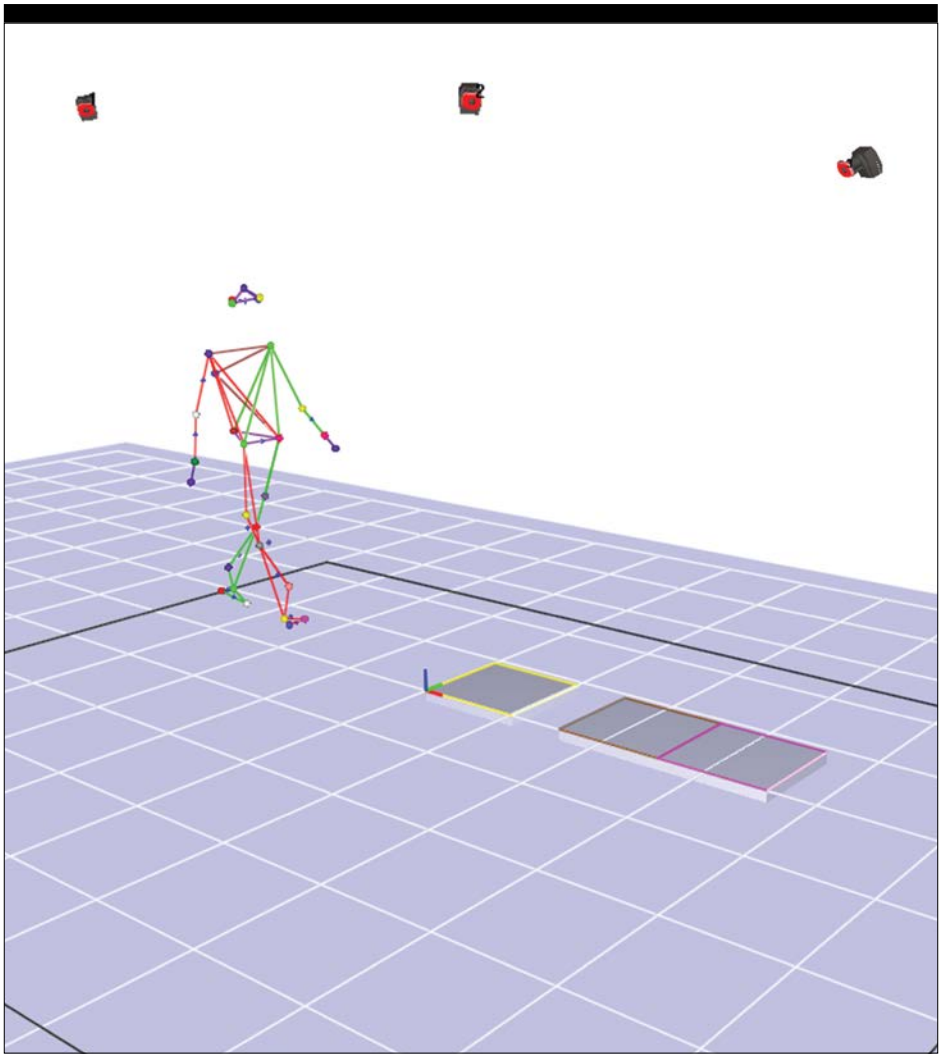
Working closely with the math department and UO Libraries, math librarian Annie Zeidman-Karpinski chose to use the renovated space to offer drop-in homework help provided by fifteen undergraduate math students—informally dubbed "the mathletes"—who are paid for their efforts. She shares the responsibility of hiring and training students with Nesselroad, who orchestrated

tions to conventional testing methods that base concussion recovery on neurocognitive response.

"Typically, kids will clear [those tests] within two weeks," Ugalde said. "The interesting thing about the university's study is that despite clearing their neurocognitive testing, subjects had this lingering difficulty with multitasking . . . showing that their function wasn't normal even two months out. That's a big deal in terms of us figuring out when it is safe to return kids to play."

AMONG HIGH SCHOOL ATHLETES WITH CONCUSSIONS, THE ABILITY TO FOCUS AND SWITCH TASKS WAS COMPROMISED FOR UP TO TWO MONTHS.

Ugalde encourages athletes and their families to participate in concussion studies so that researchers can pinpoint the amount of time necessary for recovery. Answering that question might involve a combination of tests that measure a subject's neurocognitive response as well as balance and even their stride. —MC



The testing for concussion recovery time took place in the Motion Analysis Laboratory, where researchers used cameras to capture signals from reflective markers on subjects' bodies, to create real-time computerized imagery of the subject's movements.

a large reorganization of the stacks to make the space more user-friendly.

Hal Sadofsky, department head, said the library supports a critical objective of mathematics: learning to apply it.

A common misconception about math is that it's nothing more than memorization of facts and equations. The main point, Sadofsky said, is learning how to apply math to analyze and answer nonmathematical questions in science or "real world" problems. Homework teaches that skill efficiently because students learn quickest through practice—especially when instructors can provide immediate feedback and help.

"A huge amount of the extra effort involved in teaching mathematics is in providing this feedback and help. That includes our online homework system, discussion sections and office hours," Sadofsky said. "The library homework assistance is another big weapon that students have at their disposal to win the battle of learning how to use the mathematics we are teaching to them."

"THEY BRING THEIR FRIENDS. THEY BRING THEIR DINNER. THEY STAY FOR HOURS, WORKING THROUGH HOMEWORK PROBLEMS."

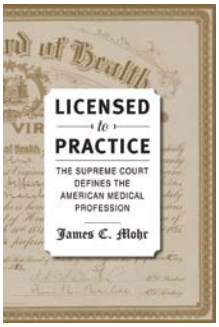
The mathletes, meanwhile, say there's more to the service than a paycheck; they've developed into an intellectual community that uses the new room as a home base. The aides hang out or hold office hours in the library because they know their peers will be there, too, chipping away at the same challenging problems of more advanced mathematics classes.

"It became the center of our experience at the UO," said aide Gen Schaack, who graduated recently. "When I showed up to campus early, that's where I went. If you wanted to find somebody to go get lunch, you'd go there—'Did you do this homework? I got stuck on this problem.' You want to feel like you're part of a community and the work you're doing is appreciated and important. My last years with the math department made me feel like I got the college experience." —MC

ONLINE EXTRAS

1

2



1) How to Tweet from Another Century. At last year's DUKTalks event, medievalist **Martha Bayless** shared "tweets" from centuries past that illustrate how brief, everyday messages—sometimes including "too much information"—are nothing new. Visit **cascade.uoregon.edu** or **DUKTalks.uoregon.edu** to find out more. While you're there, check out our other thought-provoking speakers who illustrate individual paths of discovery in the arts and sciences.

2) Tell me Mohr. An 1891 shooting in Wheeling, West Virginia, left one doctor dead and another on trial for his life. Thus begins *Licensed to Practice: The Supreme Court Defines the American Medical Profession*, a new book by UO historian **James Mohr**. Mohr tells a compelling tale of powerful personalities who shaped the way medicine is practiced today. Read an excerpt at **cascade.uoregon.edu**.

3

3) Highlight Reel. Get a video view of the trip UO geophysicist **Dean Livelybrooks** and a team of scientists took on the *Atlantis* research ship last summer, when they retrieved earthquake-monitoring equipment from the ocean floor. Their mission: to gather data to determine earthquake risk in the Pacific Northwest. Visit **cascade.uoregon.edu** to see video highlights from the trip, with breathtaking underwater images shot by "Jason," the remotely operated retrieval vehicle.

4

4) Walk This Way. What does the gait of a concussion-impaired adolescent look like? Visit **Online Extras** to see how UO researchers use animation to assess the impact of concussions on body dynamics. Seemingly simple stick figures reveal volumes about how the body compensates for injury. Learn more at **cascade.uoregon.edu**.

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1: ZAZZLE.COM, 3: MATT COOPER

CASCADE

***Cascade* is the alumni magazine for the UO College of Arts and Sciences**

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UNIVERSITY OF OREGON

BY THE NUMBERS

5 YEARS

In the past five years alone, faculty accolades in the College of Arts and Sciences have included the following:

One appointment to the National Science Board
Two faculty members elected to the National Academy of Sciences
Three faculty members elected to the American Academy of Arts and Sciences
Five Guggenheim fellows
Nine faculty members elected to the American Association for the Advancement of Science
Eleven Fulbright scholars

30 BOOKS

Number of books published by members of the CAS faculty in the past year; three are featured in this issue of *Cascade* (pages 4, 20 and 28).

7000 UNDERGRADUATES

Number of UO students majoring in the top ten College of Arts and Sciences fields:

1. Psychology
2. Human physiology
3. Economics
4. Biology
5. Political science
6. Sociology
7. Romance languages
8. Environmental studies
9. General social science
10. English

PHOTO COURTESY HARLEN LEFEVRE

Vintage Hardware

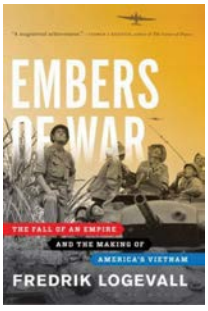
You might recognize the guy in the middle. Yes, that's Bill Gates. Next to him is Paul Allen, who cofounded Microsoft Corportion with Gates in 1975. At the far left is Harlan Lefevre, UO professor emeritus in the UO Department of Physics. The occasion? Lefevre donated a vintage computer—a PDP-7—to Allen's Living Computer Museum, which preserves "meaningful milestones in the evolution of computers." According to the museum's write-up: "There were only 120 PDP-7 computers built, and only four survive today. This machine, installed at the University of Oregon in 1966, is the only one in the world that is in functioning condition. It served the university's nuclear physics department for decades, and over thirty students earned PhD degrees through research performed with this computer." Lefevre's PDP-7 is now the first stop in the tour of the museum's exhibit hall.

Lucky Thirteen

UO anthropologist Jon Erlandson was among 164 luminaries inducted into the American Academy of Arts and Sciences in October. He is the thirteenth current faculty member to receive this honor. Shown here signing the AAAS Book of Members, Erlandson is director of the Museum of Natural and Cultural History, a professor of anthropology and a Knight Professor of Liberal Arts and Sciences. Other inductees included Academy Award–winning actor Sally Field, Emmy Award-winning filmmaker Ken Burns, novelist Martin Amis and jazz great Herbie Hancock.

Embers of War

Fredrik Logevall, MA '89, won the 2013 Pulitzer Prize for History for his book, *Embers of War: The Fall of an Empire and the Making of America's Vietnam*. Now a professor of international studies at Cornell University, Logevall will be back on the UO campus this May as a featured speaker in the Wayne Morse Legacy Series. This series, sponsored by the Wayne Morse Center for Law and Politics, will mark the fiftieth anniversary of the Gulf of Tonkin Resolution—an historic Congressional resolution that set a course for war in Vietnam. Oregon senator Wayne Morse cast one of the only two dissenting votes.



Gastropod Glory

Running on a science-is-fun-for-everyone platform, Brandy Todd was crowned 2013 Eugene Slug Queen in a raucous ceremony last August. Throughout her one-year reign, Todd will use her celebrity to promote science to youth. She is director of the UO's Science Program to Inspire Creativity and Excellence (SPICE), an outreach program targeted toward young girls, and also assistant director of administration at the UO Oregon Center for Optics. Todd won the city's annual offbeat competition—which involves outlandishly costumed contestants—decked out in a wig of phosphorescent green and running under the nom de guerre "Professor Doctor Mildred Slugwak Dresselhaus."

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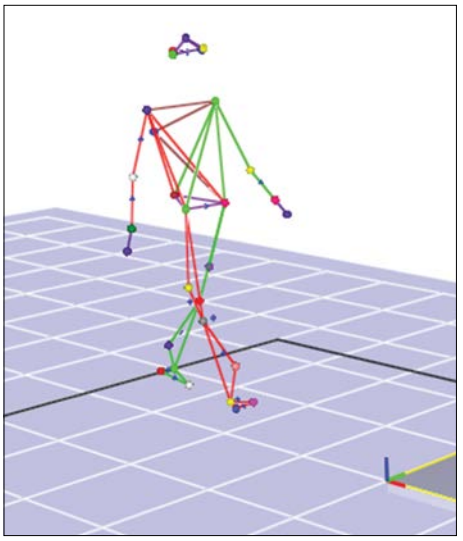

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