Features
From one ancient event to the relationship of our crops to microbes, a WSU scientist explores the possibilities of symbiosis.

Despite the hurdles, a new crop of Washington small farmers are finding their way into the field.

Upfront
Virtually going where you have never gone before

A viral response revisited: The 1918 pandemic at WSC and a modern-day plague journal

Inspiring students to dream beyond the limits of cultural stereotypes

An orchestra conductor’s concerted effort to give voice to unsung composers

Home—whether here or across the Pacific—is in her heart.
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People who are homeless struggle with health issues and stigma. Now, the challenge of keeping the most vulnerable healthy is more complicated due to the pandemic.

Sorosh Kherghehpoush, a research fellow at the WSU College of Pharmacy and Pharmaceutical Sciences, is making a positive impact in the midst of COVID-19. He and a team from the Elson S. Floyd College of Medicine perform health checks and deliver socks and sack lunches where homeless individuals congregate in Spokane.

Serving the public good and tackling real problems is a part of WSU’s 130-year history.

Symbiosis. Many of us have taken to hiking trails and forests during this pandemic, in exchange for other types of vacations. We admire the rivers, towering firs, and flowers, but it’s easy to overlook amazing fungi on the trees and rocks in front of us: the lichens.

Lichens are so much more than fungi. They aren’t even a single organism; lichens survive because of a symbiotic partnership with algae or cyanobacteria that provide carbon. Symbiotic relationships, a foundational part of the living world that we’re starting to understand even more, inspire the research of Stephanie Porter, a microbiologist at WSU Vancouver.

Porter studies the evolution of cooperation and plant-microbe symbiosis. In particular, she analyzes the symbiotic relationship between crops and their microbial community, which has transformed as humans domesticated plants. The work of Porter and her lab is motivated by the need to maintain a healthy food supply with fewer environmental costs.

On a larger level, a symbiotic relationship forms between farmers and those who eat their products. Small farmers, some of whom you’ll meet in this issue, need the support of their communities, who in turn get those delicious carrots or apples or beets. WSU plays a part, too, providing tools and training to many of those small farmers.

Connections happen at the smallest levels, even smaller than microbes, although those interactions get pretty strange. WSU researchers are digging into quantum mechanics, where many known rules become unpredictable. It’s hard to wrap our minds around concepts like entanglement, where two particles are inextricably linked and affect each other no matter the distance. However, the results of quantum research will have a profound effect on our technology and understanding of the universe.

This magazine is also deeply linked to you, our readers. We provide stories and insight into WSU to keep you connected. Unfortunately, the COVID-19 pandemic’s economic fallout has hit the University hard, with consequences for the magazine.

We will not be printing a spring issue next February due to budget cuts. We’re still producing an issue, available digitally around February 1. If you would like to read the Spring 2021 magazine, visit magazine.wsu.edu/connect to sign up for our email newsletter or to follow us on social media. We’ll have print-on-demand and other options, too.

The summer issue in May will also have reduced distribution, but we will have print and digital versions. The print magazine will be sent to WSU Alumni Association members and paid subscribers, so join WSUAA if you haven’t already. We also welcome any support you can provide to the magazine.

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FROM THE PRESIDENT

It pays to know who pays

I was happy to see Alysen Boston’s article (“An epidemic of misinformation,” Fall 2020). She is correct to point out motives of political or sales agendas. When we investigate sources, it is not enough to know the source, we must know who is paying the source. Follow the money! It is a few dollars of support from an individual or billions from an industry? Once we know that answer, motives become very apparent. Using coronavirus as the obvious example: Research for yourself who is paying billions of dollars to politicians, universities, mainstream media, WHO, CDC, NIH, certain doctors in the limelight and funding scientific and unscientific studies for and against certain treatments/cures. It is easy to find public money profit from pushing one side of an agenda, any information they pay for is suspect.

WEISLEY WILKERSON ’85 BUSI.

Proud of the pride

“Cougar confidential” (Fall 2020) brought back fond memories of my own experience as Butch and made me realize there is likely a whole cadre of other Butch alumni that go-unknown, those brought into service for events at the then newly-developing branch campuses. When I was brought in as director of development for the Tri-Cities campus, there were so many requests for Butch to appear at events in the area that it was impossible to fulfill the demand from the Pullman campus. So, WSU Tri-Cities was given its own costume.

While access to a proper costume was key, there was no training provided that anyone could recall and the only instruction provided was that Butch did not speak. My two major non-WSU sponsored events were at a Tri-City Americans hockey game and the annual 4th of July community parade.

I recall how disappointing it was after the hockey game to walk out of the locker room with Butch safely tucked into the duffel bag, wading through rows of kids who minutes before were enthusiastically hugging and high-living Butch but were now completely ignoring Glenn who emerged out of it. Gave me great respect for all the former Butches who managed to maintain their secret identity for sometimes years. A remarkable group of students and so glad they are now finally getting their due respect.

GLENN WILLIAMS ’89 BUSI.

AS THE CLOSE OF THE FALL SEMESTER APPROACHES, the University continues to make a significant difference in the lives of Washingtonians and people far beyond the state’s borders—despite the continuing challenges of COVID-19, systemic racism, and state funding cuts. Our fall semester enrollment is one testament to the quality of education we continue to deliver. Although many universities experienced double-digit decreases in enrollment this fall, WSU’s system-wide enrollment declined less than 2 percent from a year ago. Our emphasis on access in our enrollment policies continues to yield results. Nearly one-third of the 31,159 students enrolled statewide fall semester are first-generation college students. The percentage of students of color is at an all-time high, totaling 31.5 percent of the student body.

Our faculty and staff continue to creatively deliver life-changing experiences to students in a largely online environment. Professor David Theisen, for example, who teaches chemical engineering, set up multiple web cameras in his lab that allow students to design and conduct experiments in chemical processes remotely. Another professor, Stephen Hines, from the College of Veterinary Medicine, was awarded fourth place in an international competition for his podcast-style discussions.

Meanwhile, we continue to ramp-up efforts to address diversity, equity, and inclusion. Among the newest actions under way: creation of a President’s Commission on Diversity, Equity, and Inclusion, a thorough review of longstanding university policies to bring about a truly inclusive environment, and a faculty cluster hire focused on “Racism and Social Equity in the Americas.” Our new provost, Elizabeth Chilton, will play a leading role in these efforts.

Our budget continues to be a challenge. As the financial impact of COVID-19 on state revenues became apparent last spring, we were asked to cut spending by about $137.5 million. We were able to meet that goal, but it required many painful decisions. Positions were eliminated, services reduced, and equipment purchases curtailed. We expect to face additional financial challenges when the legislature convenes in January.

That brings me to Washington State Magazine. WSM is the University’s flagship communication vehicle, delivering stories that demonstrate the impact of this remarkable institution on lives worldwide. Bringing this information to you in a quality manner is costly. As part of our budget trimming, we reluctantly decided to eliminate the print edition of the February magazine and will limit distribution of the May issue. This is just one instance of the distressing choices we have made in recent months.

Thank you for your ongoing support of the University. I continue to be filled with appreciation and gratitude for our entire Cougar family, which rallies in remarkable ways to overcome every challenge that comes our way.

KIRK SCHULZ
President, Washington State University

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WASHINGTON STATE MAGAZINE WINTER 2020

ILLUSTRATION DEREK MUELLER

6
BEING THERE

going virtually where you’ve never gone before

BY REBECCA PHILLIPS

HUMANS COME FULLY EQUIPPED WITH CURIOSITY AND AN IRRESISTIBLE URGE TO EXPLORE THE NEXT HORIZON. IN 2018, THAT WANDERLUST ADDED NEARLY $9 TRILLION TO THE GLOBAL ECONOMY ACCORDING TO THE WORLD TRAVEL AND TOURISM COUNCIL.

It’s been a different story for 2020 as pandemic travel restrictions crippled airlines, cruise ships, hotels, and Airbnbs with up to 90 percent fewer bookings overall. While it may take years for the industry to recover, the shutdown is proving to be an unexpected boon for the virtual reality market, which reports a big spike in interest. Once the domain of video gamers, virtual experiences are increasingly popular with educators, ecotourism operators, retirement and care facilities, as well as would-be tourists who are bored and stuck at home.

VR technology and 360-degree video were already in use by a few airlines and travel agents as a vacation destination “try-before-you-buy” experience. Today, companies like Visualise and National Geographic give consumers a chance to virtually immerse themselves in the wonders of Machu Picchu, Cuba, the Great Barrier Reef, or even the horrors of war-torn Syria. It’s all an educational goldmine for Behavioral Business Research. The associate professor in the Carson College of Business runs a virtual reality laboratory where he studies the physiological and emotional responses that occur while someone is experiencing a virtual space.

One of his goals is to compare how people behave in real versus virtual retail environments. Using an Oculus Rift VR headset and a specially-designed computer, Perkins has participants don goggles and walk through a virtual art gallery, for example, while measuring their responses to changes in the layout and ambiance.

“We invented a way to collect data in the virtual space,” he says. “For the experiment in the art gallery, they can walk into another room and use their controllers to answer survey questions in 3D right in front of them.”

“We figured out how to get that to work was a tough nut to crack,” Perkins says. “Once you take someone out of the virtual space and hand them a clipboard and pen, the VR effects may vanish. So, we had to find a way to collect data while they are still in VR.”

Perkins says the virtual experience can activate the same emotional responses that, at least on some level, happen in the real world. He personally tries out each virtual environment before enrolling study participants and says the experience can be shockingly intense.

“I’ve done roller coasters, dinosaurs, and standing on a platform a thousand feet in the air,” he says.

An especially intense program was experiencing rock climbing. Alex Honnold free solo the 1,500-foot El Capitan wall.

“When you put on the headset, you are sort of floating in space as you watch him climb from bottom to top,” says Perkins. “A virtual astronaut training program. The kicker is that if something goes wrong, you go spinning off into space. You can be crawling along carefully fixing the space station when suddenly your rope breaks and you’re headed over heels out of control,” he says.

“When the student railed the program, he’d sweated through his shirt, and the goggles and controllers were soaked—he was so viscerally a part of that experience.”

But while virtual reality can be incredibly immersive, Perkins says the technology has a long way to go before it can become an authentic travel alternative.

“The goggles are still heavy and large, and we use little hand controllers. It can be disorienting if the space is not well designed because, when you disconnect what you’re seeing and hearing from what your body is feeling, it’s like being on a roller coaster and can cause motion sickness. So, we have to be very careful how we design these virtual spaces.

“As good as VR looks now, it will look a million times better five or ten years down the road,” he says. “Some argue it will be indistinguishable from reality—with technology we can’t yet imagine.”

“Could it be that we have the ability to increase the physiological response so that if you’re visiting a virtual beach, we can make you feel the warmth of the sun or feel like you’re actually skiing down the Swiss Alps?”

Perkins says although sensory haptic suits could provide some of these experiences, many futurists predict we will soon have computer technologies that interface directly with the brain.

“VR PANORAMA FROM THE RIM OF MOUNT ST. HELENS (COURTESY MOUNTSTHELENS.COM)
Pandemic parallels

BY ADRIANA JANOVIČ

When the first cases appeared October 1, the gymnasium was quickly converted into a temporary hospital. Three weeks later, classes were canceled for a month. The state epidemiologist ordered all state colleges under “complete quarantine.” All social activities were suspended.

By November 2, the Students’ Army Training Corps (SATC) saw 634 sickened cadets, over half their number. Just five days earlier, there were 98. By the end of the ordeal, 42 would die.

During the final months of World War I, an influenza pandemic swept through WSC, dramatically affecting the campus community. Buildings were transformed into infirmaries with as many as 300 beds crammed into one dormitory. Faculty and female students from the College of Home Economics came together to prepare meals for the sick.

“We literally had det’s from leaving,” Pullman’s Roger P. Sanborn charged both the College and War Department with neglecting the health of his son, Roger P. Sanborn. Recruited into the WSC officers corps in 1911, he awaited his call to duty. “We had to wear masks.” Hix, who worked at the College from 1911 to 1937, recalled a faculty professor who refused to show a guard his “pass. The guard pulled out his gun.”

When the pandemic was at its worst, College of Home Economics head Agnes H. Craig and her crew prepared more than 300 meals per day. In all, they served 17,000 meals per week. Women’s dorms were transformed into sick wards, along with at least two fraternity houses: Sigma Phi Epsilon and Alpha Tau Omega. Combined, they housed over 100 patients. Pullman’s Northwest Sanitarium, along with at least two fraternity houses: Sigma Phi Epsilon and Alpha Tau Omega. Combined, they housed over 100 patients. Pullman’s Northwest Sanitarium, Mechanics Building. Three local churches were transformed into sick wards, along with at least two fraternity houses: Sigma Phi Epsilon and Alpha Tau Omega. Combined, they housed over 100 patients.

By November 11, the armistice ending “the war to end all wars” was announced. People filled Pullman’s downtown streets as they celebrated peace. That same day, Craig wrote to Leila Hix, “I wanted to capture things as they were happening.” Streamas says, but to also compare remarkably similar stigmatizations across many centuries of pandemic. At the turn of the twentieth century in San Francisco, Chinatown was cordoned off and Chinese blamed for bringing disease by way of food choices and “unclean” practices. “It’s amazing how,” Streamas says, “that at times we still do it and we learn more and more, the accusations are the same!”

When Washingtonians were told to “stay home to stay healthy,” ethnic studies associate professor John Streamas began seeing a dramatic uptick in online discussions of plague like those in the 1918 pandemic. Intrigued, he devoured Daniel Defoe’s A Journal of the Plague Year (1722), published nearly 60 years after the bubonic plague swept through London. Streamas decided to write a plague journal himself but, instead of looking back, he wrote from the middle of the pandemic, embracing the flux of facts, theories, false claims, and shifting ethical ground.

Titled “It’s Not Racist if It’s Accurate: A Plague Journal on the Tag Teams of Authority,” Streamas’s journal is part of his ongoing research on the intersection of health and race. As a follow-up to the novel coronavirus, Streamas writes, “A foundational truism in Ethnic Studies is that any catastrophic event—war, economic collapse, ‘natural’ disaster—disproportionately hurts already marginalized groups. This truism stands out against the larger truism that certain politicians are vociferously racist, calling the COVID-19-causing coronavirus the “Chinese flu” and the Wuhan virus. Part of the reason the virus of bigotry continues to rage, Streamas argues, is that we simply haven’t dealt with systemic racism. ‘[Higher education and diversity] training clearly fail,’” he writes, and “are designed to fail,” as responsibility is devolved upon individuals rather than the institutions (higher education included) that perpetuate it.

Indeed, Streamas says that efforts to address this issue are “little more than self-help. Books like White Fragility and other tomes about the diversity-workshop industry all locate racism in the White culture and White individuals, he says, stripping disaster capitalists of culpability and putting the onus of change on the employees they send to diversity workshops. This line of argument is interwoven with many more moving and thoughtful passages about day-to-day life during lockdown. Many of Streamas’s students are Black and Brown, and many have experienced the worst of the pandemic, where the early months of the pandemic hit hardest. In online classes and other self-isolating spaces, the world’s billionaires were half-a-trillion dollars richer in May than they were in January.

Streamas writes, “A foundational truism in Ethnic Studies is that any event is also the shortest entry. On April 26, Streamas writes, “In the past week I have received emails from two students who have close relatives suffering the virus, and another told me his father has just died of the disease.”
Fallen, but not from history


THEY WERE husbands, fathers, sons, brothers. One was a stand-out college athlete and beloved coach. A couple were pilots. A few quit school to serve.

Some were never found.

These seven servicemen are a handshake of nearly 200 military personnel with ties to Washington State University who made the ultimate sacrifice during World War II. Now, 75 years after the end of the war, a small cohort of faculty and students in the Department of History are compiling the stories of the men and women who didn’t make it back.

The Fallen Cougars Project will celebrate the University’s war records for its World War II dead but also seek to create a framework for the digital exhibit. The biographies will be posted through the Mukuru cultural archiving program managed by the CDSC, of which Bond is codirector. A fellowship from the Center for Digital Scholarship and Curation (CDSC) at WSU allowed Sun to create the framework for the digital exhibit. The biographies will be posted through the Mukuru cultural archiving program managed by the CDSC, of which Bond is codirector. A fellowship from the Center for Digital Scholarship and Curation (CDSC) at WSU allowed Sun to create the framework for the digital exhibit. The biographies will be posted through the Mukuru cultural archiving program managed by the CDSC, of which Bond is codirector. 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The audacity to dream

BY BRIAN CHARLES CLARK

As the COVID-19 pandemic class at the fabric of American society, the worst affected are those in our most underserved communities. With bodies and spirits already propped to the limit by chronic diseases—racing, diabetes, substance use disorders, and more—Native American communities suffer terribly as those in our most underserved communities.

With bodies and spirits already propped to the limit by chronic diseases—racing, diabetes, substance use disorders, and more—Native American communities suffer terribly as those in our most underserved communities.

Pension and wisdom of their cultures while experiential health sciences camp, share in the inspired by what they learn at the hands-on, Na-ha-shnee’s long history are helping to working with her people in Grand Coulee.

More than 500 students have participated in Na-ha-shnee in its 25-year history.

BY

The story of Na-ha-shnee begins with the hiring in 1995 of Robbie Paul, a Nez Perce woman who worked tirelessly to recruit and encourage Native students to pursue careers in nursing. Undaunted, Paul has been retired from her position as director of WSU’s Native American Health Sciences program for a few years but she still mentors students.

“Na-ha-shnee was based on Native input,” Paul recalled recently. She had a Native American advisory board to help guide her, as well as rich collaborations with Barbara Aston, former tribal liaison for Wsu, and the late Sharon John, a nurse and Yakama-Sn天花 tribal member.

Hand-on experiential learning is “a proven model,” Paul says, that opens doors for young people who might not have otherwise considered a career in health care. The impact is amplified when Native professionals serve as camp counselors and share stories of their own journeys.

Janet Katz, one of Paul’s longtime collaborators and a professor in WSU’s College of Nursing, is a staunch supporter of Na-ha-shnee, as much for what the program does to bring Natives into health professions as for inspiring young people to go to college, whatever career they choose. “People with more education are healthier, they have higher incomes,” she says. “There is so much inequity in our society and usually the ones who get to go to college happen to be born into situations where they also have opportunities.”

Katz and others have shown that diversity in health care has a positive impact on quality of care and on health outcomes.

A college campus could be stressful for students who’d grown up on a reservation. Paul, Katz, and their colleagues found ways to help these first-generation students express their fears, doubts, and hopes. One way was by taking a photo that represented something that concerned them, or that they hoped for. Katz recalls, “One student took a picture of a lady bug on a tree trunk, saying ‘I am small, but college and a career are big!’”

I AM SMALL—WE ARE GREAT

From the very beginning, Paul, a passionate storyteller drawing on the wisdom of many generations, grounded students in traditional cultural knowledge. One of the stories she tells is that of the creation of her own people, the Nez Perce.

In the story, Coyote kills a monster that’s been killing animals. Coyote and Fox cut the monster had made so much trouble is empty, from the four directions, and thus people the world.

That’s the power of oral tradition: it provides a way to bring people together despite their differences.

Paul says, “I share that story because when I was growing up, my Hauda teacher told me I was just a dumb Indian. My father helped me learn that story so I would know that I was not dumb but rather was intelligent.”

“A lot of schools have been forced to adapt, and from our perspective, something was better than nothing, so we decided to do something.”

“We’re sending the participants Chromebooks, ‘to ensure they can get online,’ and every week they’ll get a package from us. It’ll contain the kits for the experiments for the week as well as any other supplies they might need for other activities. We’re sending them a microscope and slides, so they prepare and stain samples. They’ll get petri dishes, and agar so they can grow microbial cultures.

“Here are people to the way I was taught. I am bringing teaching from an oral tradition.”

James adds that while “some people would talk about cultural appropriation, the simple power of the talking circle can be used by everyone.”

New in this role as an assistant director of student mentoring and success, James likes to say that “the paint moves.”

“At a powwow, the paint people wear has meaning. It’s like a mantle, or a role, a responsibility. If you go back ten years later, you’ll see the same paint, the same roles, but different people. ‘Just as James once wore the paint of a student, now he wears the paint of a teacher. ’I’m trying to move the paint to the next generation of people,’ he says.

“We need the audacity to dream, to see our own self-worth. ‘Dreams explains. Dream big—and start with yourself!”

SUSpending judgment through mutual respect allows for the sharing of information which breeds creativity. When we become polarized, we become entrenched, thus to what could be,” James says.

James was educated at Stanford and received his medical training at the University of Washington. “What I bring is that—a melding of the two. My goal is to expose people to the way I was taught. I am bringing teaching from an oral tradition.”

As the COVID-19 pandemic class at the fabric of American society, the worst affected are those in our most underserved communities. With bodies and spirits already propped to the limit by chronic diseases—racing, diabetes, substance use disorders, and more—Native American communities suffer terribly as those in our most underserved communities.
Maestro of many voicings

A HUSH FALLS over the crowd as symphony orchestra conductor Danh Pham takes the podium and slowly lifts his button. With the downstroke, he leads the performers through a seemingly effortless musical journey that enchants the audience and clearly brings Pham to life.

A native of Honolulu’s “ethnic mixing pot,” Pham delights in sharing music with all people, whether that’s conducting the score of The Force Awakens or teaching a master class at China’s prestigious Wuhan Conservatory of Music.

The associate professor at Washington State University is known for his musical selections which embrace not only classical titles but also those by contemporary composers and musicians who were marginalized or undiscovered during their lifetimes. In his discipline, it’s really important that we focus on classics, but we have a sense of duty as artists to promote living composers who will become the Beethoven of the future,” he says.

“We also have composers who never got a chance to see the limelight because they’re women or of an ethnic minority and lacked the opportunities to matric and become part of the mainstream. Today, many organizations are trying to right those wrongs and shine a light on these composers.”

Last winter, Pham put that pledge to the test while conducting the Washington Idaho Symphony in a concert called Explorations! that introduced the public to compositions most had never heard before. “I was extremely fearful beforehand,” he says. “I didn’t know what the reaction would be. Many conservative concertgoers want to hear their Beethovens and Mozarts— the music they’re familiar with.”

Explorations! instead highlighted Black composer, conductor, and English political activist Samuel Coleridge-Taylor (1875-1912); Ellen Taaffe Zwilich, the first woman to win the Pulitzer Prize in composition; Ziaja, from the Filipino-American Community Center in Wapo. Another idea was inviting a Filipino children’s author to share her books with museum visitors.

“Experimenter is the life blood of what music groups do,” he says. “Our top concert band was supposed to tour South Korea last spring when it was just becoming a hot zone. It was also the Saturday when Washington was declared the site of the first COVID death in the country. I thought about it all weekend and on Monday, I was on the phone with our travel companies and graciously agreed to cancel the trip and refund us almost entirely.”

“Now, it’s all waiting game. We’re trying to figure out how to safely perform with singers and instruments in the same room. We’ll be working on this until we have a vaccine available.”

The isolation required during COVID times has been particularly tough on Pham, who has long seen music as a vehicle to socialize and collaborate with other people.

“It’s really difficult to do music online and alone,” he says. “You see many virtual groups performing on YouTube and Zoom, but people don’t realize the incredible amount of editing time it requires for a short 4- to 6-minute video.”

“Even though I’m a private person, my craft relays on being with other people. That’s where the joy comes out. I love working with students. I’m the doll that if there are no students, there are no musicians, and no me. Performing is about sharing—not only with the audience but with the talented musicians on stage.”

A heart for service

ON A SPONTANEOUS TRIP to the Yakima Valley Museum, Tabitha Espina (20 PhD English) pursued the history exhibits and wondered. “Where are all the Filipinos?”

A WSU Pullman graduate student at the time, she had read about the experiences of Yakima’s Philippine American citizens in Carlos Bulosan’s classic 1943 memoir, Amerika (the Original).

Espina’s question led her to a roundtable with the museum, Arts Washington, and Humanities Washington where she served as a graduate fellow, exploring ways to amplify Filipino-American narratives in the Pacific Northwest.

They came up with an idea to promote take-out, including adobo, rice noodles, and lumpia, from the Filipino-American Community Center in Wapo. Another idea was inviting a Filipino children’s author to share her books with museum visitors.

Espina is fascinated with language and the power of words, with their ability to shape identity and sense of belonging. “You grew up on the tiny island of Guam and moved an ocean away to earn your doctoral degree at WSU.”

Now an assistant professor of rhetoric and composition at Eastern Oregon University, she reflects on her experiences and draws parallels between rural life and island life. “You may not be separated by oceans. But there are other borders,” she says. “How do you transcend those borders? Not just geographically, but also ideologically.”

In isolated spaces, finding a supportive and welcoming community is essential. When Espina visited the WSU Pullman campus for the first time, she flew into the Spokane airport. “Guam is only 30 miles long, so sitting in the car with a stranger for an hour and half was new to me,” she recalls.

The stranger was Amir Gilmore, who would become her friend. He was a graduate assistant for the Research Assistanship for Diverse Scholars initiative, a recruitment effort to increase access to doctoral education for U.S. students from underrepresented or underserved communities, while increasing WSU graduate student diversity.

“After her doctoral degree, Espina investigated identity politics among Filipinos who have been colonial settlers of Guam for generations, a subject that’s both academic and personal.”

“When I was seven, I came out with an album entitled Island Girl,” she says. “But I’m Filipino, so throughout my life people have always wondered, ‘How can you claim to be an island girl when you are not Chamorro, one of Guam’s indigenous people?’

“At the time, I wasn’t having very critical ideas about positioning or intersectionality. I just thought, well, ‘Where do I belong?’”

As she learned about the struggles of Chamorro people, she asked how she could help. She is now a founding member of “Filipinos For Guam,” a group dedicated to decolonization and justice for Guam’s Indigenous people.

Espina’s work in the classroom and communities requires curiosity, like a moment in a museum. It also requires imagination and envisioning how communities can engage with different perspectives. In addition to teaching and research, she has a heart for service.

“I just want to continue to serve,” Espina says. “Serve the communities wherever I am and the community I call home in the Pacific.”

Serve... wherever I am... and the community I call home in the Pacific.

At right: Tabitha Espina, courtesy WSU Graduate School. Background image: Amazon Scout, Courtesy Amazon.
At first glance, the forces of the universe appear to be predictable. Throw a pebble into a pool, ripples will form. Toss a stick in the air, it falls back to the ground. The past is behind us and today precedes tomorrow. The past is behind us and today precedes tomorrow. The past is behind us and today precedes tomorrow. The past is behind us and today precedes tomorrow.

For millennia, humans have relied on that premise to unlock the secrets governing our natural world. It’s been a determined pursuit from the first stone tool devised by a prehistoric craftsman to the rise of ancient Greek astronomy, and later, the field of physics, one of civilization’s oldest academic disciplines.

Physicists like Newton and Einstein paved our understanding of matter, motion, energy, force, space, and time—which, in turn, opened the way to harness nuclear energy and create marvels like combustion engines, computers, and cell phones.

Today, that quest has entered the quantum realm, where things don’t always behave with predictability. In quantum’s microscopic domain, the physical world seems to move in random and mysterious ways unlike anything described by Newton or Einstein. This unpredictability gives scientists the chance to produce previously unimaginable technologies.

Over the next decade or so, renowned breakthroughs in quantum theory and engineering are expected to deliver products that will beggar the mind. The revolution includes the work of visionary researchers at Washington State University like theoretical physicist Michael Forbes. Forbes, whose voice carries traces of his Canadian roots, studies the extreme properties of neutron stars. When prodded, he good-naturedly admits his student days at MIT were much like the television series The Big Bang Theory. “I was partly like Sheldon, who is a theorist,” he says. “And, I lived with an experimentalist who was pretty similar to the Leonard Hamann.”

In fact, Forbes’s advisor was awarded a Nobel prize for a famous equation that appeared on Sheldon’s whiteboard in one of the show’s episodes. “It takes that Sheldon-type intensity to unravel the confounding complexities of quantum mechanics. If you’re not a physicist, concepts like superposition, entanglement, or tunneling can be confusing. ‘That’s because of our human size,’ says Forbes, an associate professor of physics and spokesperson for the WSU Quantum Initiative. “In our world, Newton’s laws like gravity apply. But when you look at objects at exceedingly cold temperatures or very tiny scales, quantum mechanics is the right tool.” Those things are outside of our typical day-to-day experience,” Forbes says. “It seems weird to us because we’ll never run at the speed of light or see down to quantum level to interact with material there.”

Physicists, however, have suspected there could be a quantum world since 1900, when Max Planck theorized that radiation comes in discrete packets or quanta. Researchers like Einstein, Niels Bohr, and Erwin Schrödinger expanded that idea until it finally took off during the 1940s and 1950s as what is called the first quantum revolution.

“During this period, quantum mechanics became very concrete and gave rise to the invention of transistors and lasers,” says Forbes. “Out of this came classical computers.”

In the second quantum revolution, physicists learned to precisely control and measure atoms, which enabled the development of atomic clocks, global positioning systems, magnetic resonance imaging, and an array of quantum sensing devices.

Forbes says many WSU researchers are actively engaged in quantum’s third revolution, which is focused on new quantum technologies, building ultra-precise sensors, and solving complex problems beyond the capabilities of current computers.

“We could use quantum computers to solve a lot of problems we can’t solve with classical computers,” he says. “But you can also build extremely fast analog computers that work with electrical signals and circuits.”

Quantum computing in the form of analog quantum simulations is already being used for research at WSU and forms the backbone of the University’s Quantum Initiative. The effort is aided through regional partnerships with Pacific Northwest National Laboratories, the University of Washington, and the Northwest Quantum Nexus.

“We use these techniques to try to solve problems and discover new quantum phenomena that can be engineered into practical applications,” Forbes says. “For example, we can use Peter Engels’s ultra-cold lab as an analog quantum computer.”

Engels, a WSU physics professor known for creating the first Bose-Einstein condensate in the Pacific Northwest, traps and cools atoms to the point where quantum effects become apparent, which then allows researchers to conduct experiments.

“It turns out that what we think of as particles at room temperatures are actually waves with very short wavelengths,” says Forbes. “When you slow atoms down by cooling them to nano Kelvin temperatures just above absolute zero where there is no movement at all, the wavelength increases, and quantum mechanics apply. And, the atoms in Peter’s lab get colder than any naturally occurring system in the universe. Creating such an atomistic environment has only become possible by exploiting some of the most modern atomic physics tricks.”

“Basically, it’s the perfect environment for Forbes to study neutron stars incredibly dense remnants of a supernova explosion. He says that matter in a neutron star is governed by quantum mechanics because it has been crushed to such a small scale. One teaspoon of a neutron star weighs as much as a mountain.”

“Quantum computing but usher in the wider revolution of quantum technologies,” Forbes says. “It turns out that the extremely hot neutrons in these stars behave almost identically to the ultra-cold atoms trapped in Engels’s lab.”

Forbes says “Once we understand how neutron stars behave, we can start applying it to nuclear physics and eventually use those discoveries for applications in nuclear energy.”

Forbes’s work is just one snapshot in the catalog of brilliant projects currently underway in WSU’s Quantum Initiative. Other researchers are exploring aspects of quantum chaos, optics, hyperpolarized noble gases, exotic matter, chemistry, and engineering. Their efforts not only help advance quantum computing but usher in the wider quantum technology revolution as well.

WSU Quantum Initiative Research

Michael Forbes – associate professor of physics. Studies quantum many-body theories to investigate neutron stars, cold atoms, superfluids, condensed matter, and computer science.

Peter Engels – Yaçın Distinguished Professor in Sciences. Coats atoms to nearly absolute zero to study the quantum mechanical foundations of nature. Designs new paradigms for future technologies in areas of quantum sensing and quantum analog simulation.

Brian Saam – professor and chair of the Department of Physics and Astronomy. Studies spin physics, magnetic resonance, and hyperpolarized gases for medical imaging uses such as MRI.

Kazuyuki Kase – Regents Professor of Physics. Investigates light-matter interaction guide the development of optical transistors which will greatly increase the processing speed of computers and other technologies.

Steve Tomovic – professor of physics. Studies quantum chaos, the frontier where aspects of classical Newtonian physics and quantum mechanics coexist and create highly unusual phenomena, like chaos-assisted tunneling.

Jeffrey McMahon – assistant professor of physics. Searches for exotic phases of matter through the study of quantum fluids and solids. Examples are dense hydrogen, dense water-ice, and superfluidity.

Subhasish Gupta – assistant professor in the School of Electrical Engineering and Computer Science. Develops integrated circuits for large antenna arrays that will enable the use of holographic wireless communications, autonomous vehicles, and deep-space communications.

Mark Alston Clark – chemistry professor and director of the Center for Institutional Research Computing. Conducts fundamental research in quantum and statistical mechanics and data science with potential applications for quantum computing algorithms.

Kevin Visic – associate professor of mathematics. Studies the geometry of quantum computation.
Butch and the Butchmen

BY ADRIANA JANDOVICH

The Butchmen were students with a big responsibility: getting Butch to the field for home football games back when Washington State University’s mascot was a live cougar.

“They helped relocate the cougar from its cage to the stadium and watched over the animal as students and their parents, fans, and alums came to see the big cats perform, often posing with Butch for photos. And, when WSU scored, they took a lap, carting the cougar past the stands and bringing the crowd to its feet.”

“We have always been The Wave,” jokes retired Cofax dentist Al Kilpatrick (’75 Zoöl.), a member of the Butchmen’s ‘85–86 class. Though he was chosen by the student body, he and others were selected “by the ever-loyal,” Smith says.

As ever, the goal for this year is to make it to post-season play. That’s when strong outings against conference opponents are keys for the same thing. For now, he’s looking forward to having his players back in the gym and seeing how much they’ve been able to improve in light of the challenges posed by the ongoing public health situation.

“(It was) the same thing. For now, we’re looking forward to having our players back in the gym and seeing how much they’ve been able to improve in light of the challenges posed by the ongoing public health situation. That’s when strong outings against conference opponents are keys for the same thing. For now, he’s looking forward to having his players back in the gym and seeing how much they’ve been able to improve in light of the challenges posed by the ongoing public health situation. That’s when strong outings against conference opponents are keys for the same thing.

“One of the best things we’ve done is let the student body have it,” says Whitman County Superior Court Judge Gary Liley (’73 Pol. Sci.), who bought Butch’s old cage at a surplus auction “like 25 years ago. I wanted to own a piece of WSU history.”
New stars on the market shelf

BY ADRIANA JANOVICH

IT’S INHERENTLY FESTIVE. Crimson in color and flecked with tiny golden stardusts, this attractive apple might just make for the ultimate holiday fruit. And, with its long storage capability, it’s also quite possibly the perfect pomme for riding out a pandemic.

Cosmic Crisp® apples were bred to maintain their flavor—sweet, tangy, tart—but not too sharp—as well as texture—crisp, firm, juicy but not watery—for up to a year in commercial cold storage. Even when cut or cooked, they’re naturally slow to brown, retaining their pleasing appearance.

Since their release a year ago, Cosmic Crisps, bred at Washington State University specifically for Washington’s climate, have proved to be out-of-this-world.

Good Housekeeping awarded the Cosmic Crisp, a WSU registered trademark, its “Nutritionist Approved” emblem. America’s Test Kitchen tasters scored it “significantly higher than the other apples,” noting the variety sports a thin skin that “snaps when you bite into it.” That satisfying crunch was also noted by GeekWire, which declared, “The high crunch and firmness of the flesh are deceptive since the overall impression is light rather than dense, and there is very little softness or grittiness.”

Not only is the new apple exceptionally good for eating fresh, it stands up to high temperatures in the oven or on the stovetop. “Cosmic Crisp is truly the most versatile apple on the market,” says Kathryn Grandy, chief marketing officer for Proprietary Variety Management, which helps get new fruits to the global marketplace. “I’m totally hooked on Cosmic Crisp. It’s amazing to bake with. It holds its texture and shape. But when you put your fork through it, it doesn’t fight back.”

It is, says Jamie Callison, executive chef of WSU’s School of Hospitality Business Management at Carson College, “a beautiful apple.” He would regularly buy different apples for particular purposes. Granny Smiths for baking. Honeycrisps for salads and cheeseboards. The Cosmic Crisp’s versatility, he says, is “why it’s going to be successful. It’s durable and ships well and stores well. So it’s a win-win for producers and consumers,” particularly during the current novel coronavirus pandemic, which has some shoppers limiting trips to the supermarket.

Flavor-wise, Callison says, the Cosmic Crisp is “a perfect balance of sweet and tart. It’s a hardly apple, too, so it holds up in galettes and pies. I love cooking with apples. But, sometimes, you get apples that fall apart when you bake them. Not these.” And, because of their inherent sweetness, Grandy says, “you don’t need to mix them with other apples, and you can significantly reduce the amount of sugar.”

Use the Cosmic Crisp in sweet or savory dishes, such as tarts, streusels, cobblers, upside-down cakes, salads, and salsas. The apple also pairs well with chicken, pork, and, Callison says, “of course, Cougar Gold cheese.” The sharpness of WSU’s signature canned rich white cheddar complements the apple’s sweetness. “They balance each other out,” Callison says, also noting, “Brie is always good with apples.”

Callison featured Cosmic Crisps in a slaw paired with crisp red plum-fried Northwest oysters from his 2013 cookbook The Crimson Spice, published by WSU Press, during one of the WSU Alumni Association’s Feast of the Arts events last year. “I was able to showcase the Cosmic Crisp the weekend it was going to market, which was an amazing opportunity,” says Callison, who’s also featured the apples in class. “I gave them to students and challenged them to be creative and come up with their own dishes.”

Chalk up the apple’s appealing attributes to good breeding. Premium-priced and non-GMO, the Cosmic Crisp is the product of 20 years of extensive research and development by WSU’s pome fruit breeding program, with support from faculty and staff throughout WSU Tree Fruit Research and Extension as well as the Department of Horticulture in the College of Agricultural, Human, and Natural Resource Sciences. “We have all of these different people who are helping to develop protocols for the best ways to grow them, the best time to harvest them, and how to store them,” says Kate Evans, leader of WSU’s pome fruit breeding program since 2008, when she succeeded Bruce Barrett.

The retired WSU horticulturist started lobbying for funding from the University and industry partners in the early 1980s to launch an apple breeding program. Red Delicious had dominated production for decades, and Barrett cautioned against depending too much on a single variety. In 1994, after funding came through, Barrett and his team began producing thousands of hybrid seeds and sampling the results, including WA 38, the 1997 cross that produced the Cosmic Crisp. Two years later, the first Cosmic Crisp seedling was planted. The first commercial plantings didn’t go into the ground until 20 years after hybridization.

“It takes a lot of time to produce a new variety,” says Evans, noting work is ongoing. “We have apple selections in every stage all the time. The had ones are discarded, and the good ones move to the next step of evaluation.”

Nearly 500 Washington growers have so far planted some 15 million Cosmic Crisp trees. Because the state’s apple industry helped fund the research, they enjoy the exclusive right to grow the new variety in North America for 10 years. That’s part of their allure, according to Evans and Grandy.

Consumers in statewide focus groups were also enamored with the little spacey sparkles on the apple’s deep ruby-red skin. “Cosmic” became part of the name because of those lenticels, or pores, reminiscent of distant stars. “Crisp” describes its texture while paying homage to one of its parents, the popular Honeycrisp. Its other parent is the Enterprise. Another fun fact: Cosmic Crisp is the first apple variety to be named by consumers.

Washington is America’s top apple producer, growing nearly 60 percent of the country’s crop of about 135 million boxes that rake in about $3 billion. In all, about 1,300 growers cultivate apples on some 175,000 acres, largely in Central Washington.

Cosmic Crisp finally hit supermarkets nationwide in late 2019 with a five-year, $10.7 million marketing campaign. Unless you were living on another planet, you couldn’t miss its release. The apple has its own Instagram, Twitter, and Facebook accounts, plus a Pinterest page, YouTube channel, and website. And it’s made headlines in the Los Angeles Times, New York Times, Seattle Times, Wall Street Journal, USA Today, Popular Science, Time, and more.

Some 1.55 million boxes are slated to ship this season, compared to 346,000 boxes in 2019. The volume will increase each year and by 2026 more than 21 million boxes are expected to ship.

“I call it the billion-dollar apple,” Grandy says. “I don’t know that that’s an accurate number, but to me it feels like our growers have spent hundreds of millions of dollars. They’ve made just an enormous investment.”

That support, she says, has helped the Cosmic Crisp exceed expectations “many times over. It sold out everywhere we sent it.”

Washington is America’s top apple producer, growing nearly 60 percent of the country’s crop of about 135 million boxes that rake in about $3 billion. In all, about 1,300 growers cultivate apples on some 175,000 acres, largely in Central Washington.
Some two billion years ago, a dining experience went sideways. An early nucleated eukaryotic cell engulfed a cyanobacterium—but instead of digestion, co-housekeeping was the result of the union. This ancient endosymbiotic event brought together the mobility of eukaryotes with the photosynthetic ability of cyanobacteria, an evolutionary win-win that resulted in the creation of a new type of organelle—the chloroplast—precipitating the ascendance of plant life on Earth.
The Greek historian and travel writer Herodotus wrote 2,500 years ago of an altogether different sort of dining experience. A plow parches in the gaping mouth of a Nile crocodile, feeding on the leeches that, in turn, are feasting on the croc’s blood. Keen on extracting moral guidance from natural phenomena, Herodotus said that we should learn friendship from the cooperation between the unharmed bird and the predatory reptile.

The example of the plow and the crocodile has served as a paradigm of symbiotic relationships clear through the nineteenth century. But around the time of Darwin, scientists began to look at symbiosis with new eyes. Thanks to their work, we now know that some of the most important evolution- ary innovations in the long history of life on Earth—organisms within endosymbiotic cells, such as the chloroplast and the mitochondria—are due to symbiosis.

Symbiosis occurs when two or more spe- cies live together in close physical contact and, strictly speaking, need not be mutually benecial. Mutualism, where species cooperate to their shared benefit, is a type of symbiosis. Some researchers argue that bees and flowers, as interdependent ecological niche mates, are symbionts. Similarly, humans and our food plants and animals are in symbiotic relationships we need to eat them, so we give them what they need to grow to an edible state.

As biologists realize that cooperation is as important as competition or predation in the evolution and maintenance of ecological roles and niches, they are also seeing that microbes are foundational partners in the success of a huge number of life forms. **THE MICROBE CONNECTION**

For microbiologist Stephanie Porter, an assis- tant professor at Washington State University Vancouver who studies the evolution of coop-eration and plant-microbe symbiosis, “The microbe is the set of all microbes that live in and on plants and animals. Understanding the complex and often positive role the microbe plays in the health of plants and animals has precipitated a real renaissance in biology. There’s been a blossoming of ideas due to new genomic tools for understanding this microbe.”

“But there’s also been a shift in thinking about microbes. We’ve moved from micro- bies being viewed strictly as the cause of diseases or that they are at best harmless, to thinking they have a lot of positive effects on plants and animals. They help plants and animals resist diseases or tolerate envi- ronmental stress and we didn’t previously recognize this. It’s an opening of our eyes to this whole world of complexity that didn’t exist before this paradigm shift in the field.”

Porter and her team of collaborators, which includes other scientists as well as WSU Vancouver undergraduate research interns and graduate students, design experiments that tease out the genetics of cooperation—experiments that at the same time shed light on big evolutionary questions. Her lab is itself a kind of symbiotic relationship. Individuals from varying backgrounds bring hypotheses and design solutions to the table as they all seek answers, Porter says, to “fundamental questions about why plants and microbes coop- erate.” Among other things, Porter’s group has keenly interested in understanding how coop- eration lasts when, as she says, “the temptation to cheat might turn partners into enemies?”

These are questions that are critical to the resiliency of the human food system threatened by a changing climate that drasti- cally increases stresses. Problems that become more frequent under climate change, Porter says, include soil salinization, drought events, extreme temperature, insect herbivores, and insect-borne pathogens. Researchers in Spain recently conducted experiments suggesting that a two-degree Celsius increase in tempera- ture results in a tripling of soil pathogens. Maintaining a healthy food supply, while minimizing the environmental and economic costs of agriculture, is motivating forces in Porter’s lab.

“Fungi and bacteria that live in plant roots perform functions that we expect, like providing nutrients to the plant, or taking up space and therefore preventing pathogens from invading the plant. But they also manipulate the hormonal and metabolic profiles of plants to make them resist all kinds of different stresses,” Porter says.

She and her team are also investigating symbiosis from the microbe’s point of view. As Porter points out, there has been lots of work on that relationship from the perspec- tive of crop plants (including at WSU), but understanding why a microbe would go to work for a plant in a new frontier.

**LONG-TERM RELATIONSHIPS**

Even before humans had any clue that there were organisms they couldn’t see, we knew there was something in soil that made plants grow.

Take alfalfa, a legume grown in Greece for livestock fodder since at least the time of Herodotus. When Europeans colonized the Americas, they brought livestock and alfalfa to grow. Turns out, the plant was missing its ancient partner, a kind of bacteria called rhizobia.

Alfalfa, and other legumes in the pea family, depend on root-dwelling bacteria to convert nitrogen from the air into a form the plant can use. There bacteria essentially fertilize the plant. European colonists “had to bring soil from Europe to seed their fields,” to colonize the soil with compatible rhizobial bacteria and other microbes, Porter says. “They shipped trainloads of soil from their successful alfalfa fields to new areas of cultivation.”

But why would the relationships between legumes and their nitrogen-fixing associates persist for such a long time? “When you cooperate, you are giving valuable resources to someone else instead of your own offspring,” she says. “Darwin considered cooperation to be a mystery and a problem for the study of evolution. Natural selection should select for traits that benefit your own offspring. So how is it stable over the long term to give resources away—why wouldn’t an unrelated partner just cheat you instead of reciprocating?”

As Porter and others have learned, cheat- ing can be a winning strategy. But biologists have drawn on a theory from economics called partner choice to explain why cheaters don’t prosper in most cooperative interactions.

“In an economic market,” she explains, “partners can see who is going to benefit them and preferentially allocate resources to them.” In a symbiotic relationship, “if there is exploitation going on”—as when a non-nitrogen-fixing bacterium sneaks into a legume—one partner can “stop cooperating before it makes a bad investment.” Partner choice explains some forms of associations, but “cooperation has many forms. It is deep and challenging, and one hypothesis doesn’t work across all these different forms.”
**Cooperation sometimes evolves when the ecological benefit to the host is artificially aligned,** Porter says. One example of a stable symbiotic relationship is between the Hawaiian bo Baldwin’s and its bacterial symbiont, which produces a bacterium called **Vibrio fischeri.** The bacteria live in the squid’s light organ. In exchange for sugars and amino acids, it gives blue light—providing the squid with protection from predators as it nocturnally feeds close to the ocean surface. Without the bacteria’s glow, the squid would present a dark silhouette against the moonlit surface, making it easy pickings for humans and predators looking up from the depths below.

Porter says “the squid is equallyprized to maintain cooperation in these bacteria because the same genetic capacity that makes these bacteria glow allows them to detoxify chemicals the squid fills its light organ with. So, the key trait of the bacteria that helps the squid is also the same one that allows it to live in the squid’s organ. It can’t cheat, because if it didn’t have the genetic capacity to make light, it wouldn’t be able to live there, anyway.”

Another method symbiots use to ensure a good fit is called screening. Basically, the host organizes its own entrance exam to make sure only the most beneficial organisms can pass. Acacia trees and ants are a good example. The ants live in a special hollow thorns on the tree, where they find food, denned in moist, liquid-rich bodies the tree produces. Ants bite any insect or animal that tries to eat the tree, defending the tree. Acacias put out reallively good food being in the most aggressive ant colonies, because they’re the ones that can outcompete all the other ants for this great feast. More aggressive ants are better at warding off animals that try to eat the tree. The big ants allow the tree to screen for the best defenders.”

**CHANGING PARTNERS** Just as humans do, plants have microbes critical to their health. But there appears to be a whole new level of pest control from humans, making microbes less valuable. Porter and her colleagues have found that crop plants often have microbes of reduced species diversity that may not provide the same level of benefit as do the microbes of wild plants.

“They have domesticated most crop species that now depend on us,” she says. “Corn can’t grow in wild, and many of our fruit and vegetable crops can’t survive without us—and we can’t without them. It is possible that elements of plant-human relationship have replaced microbial services to plants. If that’s the case, there’s a lot of potential to benefit from reintroducing beneficial microbes to crop plants.”

Since microbes are known to provide plants with defenses against pathogens and, in some cases, nutrients, encouraging crop microbiome associations to mimic those of wild plants might reduce agrochemical use. But that’s a big gap. As Porter points out, “We’re far from understanding resting wild-type microbiomes to crop plants would help make agriculture more sustainable because we don’t know what the costs might be. Maybe being better at managing symbiots now a lot of energy that might otherwise go to producing a larger yield, or to having some other benefit.”

“We have to do the science first! We have to find which aspects of the microbiome changed during crop domestication and which did not.” It’s possible that some crops are better off not relying on their microbiomes. “There are lots of steps to figure out before providing products to farmers.”

“Those products, called inoculants, would be applied to seeds, or sprayed on fields after sowing.”

“The Holy Grail,” Porter continues, “is identifying the ways in which crops are deficient in their ability to control symbiots,” and comparing the genetics of those plants with wild relatives that manage the relationship well by making sure cheaters don’t prosper.

“Could we then intrinsically those traits back into crops and reduce our dependence on agrochemicals?” Porter asks. “It’s an option often overlooked by researchers, requiring many generations of backcrossing to successfully move a trait from one species to another—but it is more acceptable to consumers than genetic engineering, where a gene is artificially introduced into the target plant’s genome.”

The recipient of a prestigious National Science Foundation Early Career Grant, Porter’s group is seeking to answer the question, “How can we harness our crops’ ability to benefit from microbes through domestication?”

In looking for the genetic controls of symbiosis, they hope to “select variants that allow the plant to have optimal symbiotic and optimal outcomes with its microbes.”

Together with WSU plant pathologist Marion Paris, Porter is working on in which plant-microbe relationships were experimentally manipulated. Across the studies, they saw that fungal symbionts were more important for ameliorating stress than bacteria, though both are critical for plant health. The message from that study, Porter says, “is really about the potential for improving plant health via its microbiome, especially under stress.”

In a 2014 paper, a group of scientists described hundreds of studies in which introgressed wild genes enabled domesticated crops to resist pathogens, insects, and improved seed nutrition. One notable example of targeted introgression, the researchers write, comes from the common bean, “Phaseolus vulgaris.” Breeders have successfully introgressed genes confering resistance to insects... and pathogens. Also, on other populations, these traits can be passed on through genetic inheritance to increase nitrogen from rhizobia bacteria gives them an advantage.”

“Legumes can be pests that can also greatly benefit humans.” It’s a powerful symbiotic relationship that has been harnessed in agriculture for millennia. It’s a really nice area for both understanding pesticide, herbicide, and fertilizer use.”

Porter’s work builds on this in trying to identify which genes from wild relatives could boost symbiotic abilities in our crops.

**THE NITROGEN FIXERS** Among others, Porter studies nitrogen-fixing rhizobial bacteria, which, she says, “have intense coevolutionary arms races with any organism, often driven by their genomes that confer symbiotic ability. The genes for symbiosis are on a large plasmid is usually circular ring of DNA that can replicate independently of chromosomal DNA.”

Angeliqua Montoya (18 BSc), a graduate student working with Porter, calls it the “symbiosis island. It can be lost or gained—or they just kick it out if they’re feeling stressed.” When the bacterium ejects the island, it can gain an advantage and can be ejected in turn by the plant. The bacterium is then left to dine on decaying organic matter in the soil.

“We need to understand the potential for these strains of mesorhizobia to give up on cooperation.” Montoya adds, “especially under stress.”

In a 2010 paper, she and a colleague write that “trade-offs in nitrogen fixation among rhizobial species are adapted to these soils while others are adapted to nearby metal-poor soils.”

“Environments are highly variable and potentially structured,” Roberts says. “Stand in one spot in a forest: there’s a dry patch over here, there’s a sunny patch over there and each little patch will likely have its locals-only population of specially adapted microorganisms.”

On a global scale, the myriad microbial eco-niches do form a kind of metaphorical forest—“and it’s only recently that we’ve begun to discern the fine structure of the individual trees. And what we now see is that, from root crown, these species, various, legumes, squids, or real trees, are engaged in intense struggles to survive. Struggles that, strange as it may seem to the old idea of ‘survival of the fittest,’ are in fact often a matter of cooperation.”
feature

Pablo Silva started working in the fields as soon as he arrived in the United States. He was 14, picking strawberries in California. Agriculture, he says, is in his blood.

Silva was born in the village of Santa Cruz Yucucani in Guerrero, Mexico, and spent a lot of time growing up at his grandmother’s house outside of town. She raised animals and grew corn and beans and, he says, in Spanish through a translator, “I always helped her.” When his father in California called for his son to join him, they worked together in the strawberry fields for a couple years before moving to the Skagit Valley. Silva picked strawberries in western Washington for about 15 years before making a transition most pickers never achieve: from farmworker to farm owner and operator.

While Latino people make up 93 percent of all farmworkers, according to the U.S. Department of Labor, they account for just 3 percent of farm owners. Language and other barriers keep many from making the move. Washington State University Food Systems’ Immigrants in Agriculture Program helps farmers like Silva write business and whole-farm plans, apply for grants and loans, explore value-added products, connect with markets and buyers, and more.

The Immigrants in Agriculture Program, jointly housed out of WSU Skagit County Extension and the School of the Environment, is just one way that WSU Food Systems helps Washington agriculture, particularly first-time and small farmers. Those farmers can take classes, tour farms, attend specialized farming conferences, and meet with and learn from successful farmers. The program also offers online farm finder tools that make it easier for consumers to connect with local food producers.

“The small farmers of Washington state are really the backbone of the local food community,” says Nicole Witham, statewide coordinator of Food Systems, a program of WSU Extension within the College of Agricultural, Human, and Natural Resource Sciences. “If we don’t foster and support them and let them up, they don’t thrive. They don’t become mid-sized farmers,” she says. “We need a pipeline for new and beginning farmers. They are the farmers we’re going to rely on to provide us food within our local community.”

“We’ll rely on them more than ever in the future. With the world population expected to reach 9 billion by 2050, the United Nations Food and Agriculture Organization estimates that, to feed everyone, sustainable food production will have to increase by 70 percent. However, there is an across-the-board decline in the numbers of farms, farmers, and farmland, as well as an aging group of farmers, in the United States.

Although American farmers are historically White, male, and older, the faces of small farmers in Washington state are becoming more diverse. They include more women and people of color—particularly Latino—as well as young, military-veteran, and first-time farmers. Among their biggest challenges: coming up with capital and locating land.

Despite the hurdles, a new crop of Washington’s small farmers are finding their way to farming from varying backgrounds and employing different methods to production agriculture. They are farmworkers like Silva; Melony Edwards, a young Black woman who started in food service, and Jim Long, a first-time farmer after 30 years in the United States Air Force.

Silva and his wife, Maura, established Silva Family Farms in small steps with support from the Food Systems Immigrants in Agriculture Program. “In Mexico, I just finished third grade,” Silva says. “We lived so far from town. It was hard to get there, and the teacher was not there every day.”

Silva Family Farms, Burlington and Oak Harbor

“Owning a business was completely new to me,” Silva says. “I had never owned a business before. I had always worked for someone else in agriculture. In a way, that’s easier. You work and, yes, it’s really hard work. But by the end of the day you can go home and you don’t have to think about the business.”

Now as an owner and operator, “you go home and you have to think about it—from planting all the way to sales.”

Silva is no stranger to long hours. As a longtime farmworker, he would often leave for work around 4:00 in the morning and return around 10:00 p.m. or midnight, depending on harvest and additional duties. “I couldn’t see my kids,” he says. “I would leave while they were sleeping, and I would come home when they were sleeping.”

Most days, it’s still like that, leaving around 5:30 in the morning before his children wake up. But now he works during the day for a smaller organic berry farm with stable hours and returns home from his own agricultural enterprise at night.

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He took English as a second language classes at Skagit Valley College, a tractor-driving class through WSU Skagit County Extension, and Cultivating Success, which offers an overview of production and marketing options for modern small farms. “I learned how to start a farm business, write a business plan, and think about your goal and your mission,” Silva says. “I also learned how to create your own policies and how to comply with government regulations.”

In 2016, his employer, Row Hill Blueberries, rented a quarter of an acre of certified organic land to Silva so he could cultivate his own berries on his off hours. The following year, Silva expanded, renting an acre for organic strawberries at Viva Farms, a nonprofit farm business incubator and training program in King and Skagit Counties. Its mission is to empower aspiring and limited-resource farmers by providing bilingual training in holistic, organic farming practices as well as access to land, infrastructure, equipment, marketing, and capital.
Since its founding in 2009, Vista Farms has trained more than 500 small farmers in sustainable organic farming.

Today, Silva cultivates three and a half acres of organic strawberries and raspberries at the farm incubator. He also grows organic blueberries, raspberries, and blackberries on four acres at his own farm in Cig Harbor, which offers U-pick on weekends. “It’s a lot,” he says. “My wife helps me a lot. That’s why I can do it. Otherwise I won’t make it.”

Melany Edwards found her way to farming through food service. But Ebony by Nature, Whidbey Island

I’m young and Black, and I’m a woman. There’s not a lot of farmers like me in Washington, especially in rural farming,” Edwards says. “You see it in the urban landscape. Seattle has a lot of urban farms run by people of color, but not in rural farming.”

Melony Edwards

Ebony by Nature, Whidbey Island

But Blacks historically played a significant role in American agriculture, enslaved for centuries, followed by sharecropping and tenant farming. Racist violence against Black farm owners in the South and decades-long, well-documented discrimination against Black farmers by the USDA—which excluded Blacks from farm loans and assistance—contributed to their decline. In fact, the number of Black farmers fell so drastically that, in 1982, the U.S. Civil Rights Commission predicted there would be none left by 2000.

In the Pacific Northwest, systematic disenfranchisement of Black farmers predates statehood. Exclusion laws prevented Blacks from settling in what was formerly known as Oregon Country and, later, the Oregon Territory, including present-day Washington. “Today’s current lack of land ownership for African American farmers in the PNW is a direct result of those laws,” Edwards writes in Sound Consumer, a publication of the Seattle area’s PCC Community Markets. “The majority of Black farmers in the PNW are leasing land with the hopes of owning it one day. But the limiting factors, such as increasing cost of land and lack of land-purchasing knowledge within the Black community, add steep barriers to an already disadvantaged field.... With land ownership we could reclaim our ancestral skills and re-associate farming with power versus slavery.”

A century ago, there were nearly a million Black farmers in America. Today, there’s not quite 48,700, making up 1.4 percent of all farmers. Most of them—88 percent—live in the South and Mid-Atlantic.

Edwards, originally from Ohio, moved to Washington state with her family as a teen. She majored in hospitality in college and have five children ranging in age from 3 to 15. The oldest, Pablo Jr., helps his parents on their farm.

The Silvas bought a blueberry farm in 2019 from friends on Whidbey Island, more than doubling their operations. With the training he pursued through Viva and WSU, “we were able to advance and expand quite a bit,” says Silva, who didn’t quit his day job once he became a business owner. He continues to work as a field manager at Bow Hill, where he’s worked for nearly 10 years. In fact, Bow Hill sells his blueberries. Silva’s berries can also be found at the Bayview Farmers Market in Langley, through the Puget Sound Food Hub, Food Co-op in Port Townsend, Skagit Valley Food Co-op, Chumacum Corner Farm Stand, and more.

“We hope to continue to build our business,” Silva says. “No one in our family before us has ever been a business owner. We want to show our kids they can start their own business. It’s not necessary that they have to go be farmers. But we want to show them how to start a business and teach them about that.”

And he encourages others who are thinking about starting a business to “go for it and start and try. With the support that’s available from places like WSU you can really move forward. So go for it.”
for young farmers, including beginning farmer training, outreach to socially disadvantaged farmers, and mental health services for farmers. She was recently appointed to serve on the coalition’s board of directors. She’s also shared her story and perspective in essays and on panels, including, in 2018, the inaugural Scalia Food Task Summit and the Tith Alliance Conference, where she gave a talk titled “The Unbearable Whiteness of Farming in the PNW.” Today, she’s working on building a network of Pacific Northwest Black farmers. She’s also working with the Oregon Seed Alliance to build a network of Black seed growers.

She’s participating in the 2020 Heirloom Collard Green Variety Trial, hosted by Seed Savers Exchange and Southern Exposure Seed Exchange, and growing some 20 different varieties of heritage collard greens, including a few that were almost forgotten. She’s participating in the 2020 Heirloom Collard Green Variety Trial, hosted by Seed Savers Exchange and Southern Exposure Seed Exchange, and growing some 20 different varieties of heritage collard greens, including a few that were almost forgotten.

Jim and Connie Long
Fresh Cut Farms, Deer Park

The Longs founded Fresh Cut Farms in 2016, planting berries, starting a garden, and taking the name from the road where they live: Cross Cut. “We’re Fresh Cut on Cross Cut,” says Jim, who retired with the rank of chief master sergeant in April 2019.

In 2017, just one year into their farming operation, he was stationed overseas for a 12-month assignment, leaving Connie to manage their new venture on her own. Before he left they sold off the cows and goats to help lighten her load. She brought berries to the farmers market for the first time that year.

When Jim returned, the couple sold berries and other produce at two farmers markets instead of one. They also planted 120 cherry, apple, peach, nectarine, and apricot trees on about a half-acre. They’re hoping to increase their orchard to an acre and a half during the next several years.

The Longs also hope to expand their garden, which now stretches about a third of an acre, to an acre and a quarter, but not much more: “We’re both hands-on,” says Connie, who worked in management for a hospitality company before retiring a couple of years before his husband. “Just enough for the two of us,” Jim says. “We can’t do much more than that.”

Last winter, with the help of a USDA grant, they installed two high-tunnel greenhouses to expand their offerings. “We want to make it like a grocery store experience, so we have variety and you can get all your vegetables at one stop,” Jim says, noting, “We won’t sell anything we don’t grow ourselves.”

While their farm isn’t certified organic, the Longs use organic practices. Among their crops: kale, kohlrabi, Bibb and other lettuces, spinach, peppers, raspberries, strawberries, squash, tomatoes, potatoes, corn, cabbage, and more. Now they’re regulars at three farmers markets: Clayton on Sundays, Fairwood on Tuesdays, and Emerson-Garfield on Fridays. Twice a week, they also offer online ordering with pick-up on Thursdays and Saturdays.

Their plan is to grow slowly—and that’s something they learned through WSU. They went through Cultivating Success as well as five or six other classes through Extension and Spokane Neighborhood Partners. Lessons learned include, Connie says, “Don’t try to tackle everything at one time. Start small, then move on to the next step. Master that and keep going.”

The classes “gave us ideas and contacts,” Connie says. “They laid the foundation.”

Long-term plans include turning two small grain silos into campsites, and maybe adding U-pick opportunities. The Longs are also thinking about adding flowers and Christmas trees. “And when the historical farmhouse is renovated, ‘We want to get into agritourism,’” Jim says. “We’d like to be self-sustaining, like the farms of old. We would like to grow and take care of ourselves.”

Jim says, “I want to farm,” says Edwards, whose goal is to raise sheep and expand her seed-growing business. “And I’m determined to reclaim farming in my own way.”
The ultimate physical exam

BY ADRIANA JANOVICH

SALLY AIKEN became president of the National Association of Medical Examiners at the start of 2020. The first calls about the novel coronavirus came in early March. Since then, she’s talked about the pandemic with reporters from Politico, Vice, Chicago Tribune, Miami Herald, Washington Post, Wall Street Journal, USA Today, Rolling Stone, Daily Mail, Associated Press, CNN, CBS, NBC, ABC, and more.

“You name it,” says Aiken (’78 Bacterio. & Public Health), who’s become a go-to expert source for the media and the main spokesperson for the association while maintaining her demanding day job. “It’s been crazy.”

Aiken, a board-certified forensic pathologist, serves as Spokane County medical examiner, overseeing an annual budget of about $1.4 million and an office that performs more than 575 autopsies each year. She's held the position for 20 years, performing more than 9,000 autopsies in all and testifying in court so many times she’s lost count. “I stopped counting after 400 times and that was a long time ago,” she says, noting her role has become even more challenging in the face of COVID-19, which she says is one of the most unusual experiences of her career.

But, long before the pandemic began, her field experienced another challenge: a shortage of board-certified forensic pathologists during the ongoing national opioid crisis. The country’s premier professional organization for medical examiners that Aiken heads is working on a number of initiatives to increase numbers. Aiken, the sixth woman president in the association’s history, was elected to the top post in fall 2019 while serving as its vice president. Her one-year term ends in December.

Meantime, she represents more than 1,300 members, including nearly 600 board-certified forensic pathologists with specialized training in investigating deaths and performing autopsies in unnatural deaths, such as homicides. In Washington state, a medical examiner must be a board-certified forensic pathologist by law. This differs from coroners, elected officials who are responsible for investigating unnatural deaths but don’t perform autopsies.

The role, Aiken notes, is often misrepresented on screen. “You’ll see women in leather and full makeup,” she says. “In real life, ‘It’s not as glamorous. We’re wearing full PPE, especially now. You’re wearing three pairs of gloves, and your hair is covered—the whole thing.’

“We’ve always been at risk for infectious diseases, from COVID-19 to AIDS and more,” she says. “One of the changes because of the pandemic is we have to wear PPE when we go out to scenes. Also, we now screen everyone for COVID-19. If any of these 12 symptoms we use for screening are positive, then we need to test. We’ve been very fortunate in Washington because the state has been very proactive in dealing with people who die of COVID-19. We’ve had test kits available the entire time and can get results in a day or two.”

Other tests take longer than portrayed on TV. “It takes a long time to get DNA back,” Aiken says. “And, ‘We don’t always get the answer. In TV shows, there’s always an answer. But, sometimes, a death remains a mystery, something medical you haven’t seen before, something unusual. You’re always learning.’”

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This year, the number of deaths is up "and not just because of COVID-19," Terry Tick-tack started in January before we really believed COVID-19 was circulating that much. Suicides have been up 15 percent nationally for the last three years, and they're seeing an increase here. We're also worried about opioid deaths. And, people are staying home a lot more these days, so a lot of unusual home accidents are happening. It seems that people are driving faster and taking more risks in general."

Some of the high-profile cases she's worked include one of the victims of "Yosemitel Killer" Cary Stayner, who was convicted of four counts of first-degree murder in 1999. Chasin Starback, a mother of five who was strangled in her home in 2001; and Sumner Phelps, a 4-year-old who died in 2007 as a result of child abuse. But Aiken notes, high-profile cases are not any kind of a benchmark in her practice. "After a while, you find answers for grieving families members is more important to her, regardless of whether the case is mentioned in the media."

Aiken comes from a big Cog family. Her sisters Kathy Aiken ('80 PhD Hist.) and Mary Fitchback ('76 Comm.) and brother Jerry Aiken ('81 Hist.) are all WSU alumni. Her father, William David Aiken ('47), attended a UW PhD program, and her mother, Dorothy Louise Snyder Aiken ('47 MA Phys. Ed.) are also Cogs, along with two nieces.

"I had a great education at WSU, and I really valued my time there," Aiken says. "It was a great preparation for graduate school. Some of the things I learned in my biology classes, I still think about."

Her department recently moved into a $12.7 million state-of-the-art building near WSU's Owen S. Floyd Cancer Center. The new building is 55,000 square feet, doubling the space and adding 24 new offices. The design also makes it easier to do autopsies while social distancing. Aiken says she hopes more first-year students will have a chance to visit and observe autopsies and maybe even get inspired to pursue forensic pathology.

She approaches her job as the ultimate physical exam, treating decedents with care. "I've never regretted this line of work," Aiken says. "It's a privilege. You speak for the dead. But you do this work to benefit the living, for adjudication and also for public health, which is really apparent right now during COVID-19."

When she was in fifth grade, TARYN DALY convinced her parents to take her to a local Circuit City store, where KUBE 93.3 was hosting an event with longtime Seattle DJ Eric Powers. Daly wanted to meet him.

"He was the first radio DJ that I felt super connected to," she says. "Nearly 20 years later, Powers is a weekday afternoon host at HOT 103.7, Seattle, and "when they told me he was going to be on air on one of our sister stations, I fanned so hard.""

These days, fans wait in line at promotional events and music festivals like Pain in the Grass to catch a glimpse of Daly ('07 Comm.) and during the last 15 years, for the weeknight DJ at 99.9 KISW "The Rock of Seattle." "Her signature tagline: "Taryn It Up."

"She's known for her on-air energy and enthusiasm as well as love of flesh, local India pale ales, animals big and small, the Seattle Seahawks, and last but not least, Washington State University Cougars. "My four years at WSU were four of the best years of my life, and I wouldn't trade that for anything," Daly says. "I love being a West Side Coug." Daly lives in Stanwood and typically commutes to the station in downtown Seattle, a drive that takes about an hour each way.

"It's the best of both worlds," she says. "I get to spend time outside. It's not outside or at work or at home, you can typically find me at a brewery, trying a new IPA. I connect with listeners because I am one of them."

Daly has been learning to balance being a new mom while working from home full time. Her son, Barrett, named for Barrett Martin, former drummer of Seattle band Screaming Trees, was born at the end of August 2017. "You have to be persistent and work your butt off. I got my dream job at my dream radio station when I was 30 years old. It hit the lotto of radio. I feel incredibly lucky."

Five questions with Jennifer Adair

JENNIFER ADAIR ('95 PhD Genetics and Cell Biol.) had never heard of Pullman when she considered applying for Washington State University's School of Molecular Biosciences. She even admires, at first, she confused WSU with the University of Washington. Now, after completing her doctoral degree at WSU's National Institute of Health Protein Biotechnology Training Program, the proud Cougar and geneticist can treat genetic disorders, HIV, and cancer as the Fleisher Family Endowed Chair in Gene Therapy Translation at the Fred Hutchinson Cancer Research Center in Seattle. Her goal: provide safe, cost-effective applications for gene therapy that can be implemented worldwide—and save lives.

What does your job entail? "My research team develops new technologies that help to distribute gene therapy treatments on a global scale. We focus on delivering gene therapy to blood cells for a wide variety of diseases including those that arise from our own germ-line (inherited diseases), or from infections, such as HIV, and cancer. These diseases have incredible impacts on the population, and they are global health burdens. Currently, the best approach to treat these disorders is a bone marrow transplant from someone with the same tissue type. Finding those matches is difficult and getting the matches to accept one another adds another layer of difficulty. We're working to create a better treatment solution by using the patient's own blood cells, completely eliminating the need for a match from another person.

Why is your work important? "Tens of millions of people on the planet are struggling with diseases that could be treated with blood cell gene therapy. In this time period, those tens of millions of people had the ability to work and be healthy and live a better quality of life. That's tens of millions more brains worth of ideas that could have the freedom to think of other solutions to problems like climate change, food insecurity, and political stability. Providing basic human health exponentially increases the advances we make as a species.

Why did you choose to join the graduate program at WSU? "I had a passion for science and work specialized in chemistry, and I wanted to branch out and do more of a genetics and cell biology flavor. I was very excited for the graduate school interview, it had only been a short time since WSU had announced the formation of the School of Molecular Biosciences, which meant you could do a
take each failure as another step forward from failures, not by getting it right all the time. I remember that great success primarily comes to embark on a graduate degree? WSU. The training program put me in a position in the field. I had big dreams when I came to me feel like that was something unacceptable. But with enthusiasm, and those at WSU never made me feel like you already know it all. It's great to be confident, but it's good to be open to learning new things. When you're humble and open your self-esteem, it minimizes failures.

Building on new directions

WENDA REED

Architectural and engineering companies headed by minority owners are, well, a minority. They are mostly small and don't have the networking base that larger, more established companies do. PEDRO CASTRO (32, MS Arch), owner of Magellan Architects in Redmond and an immigrant from Brazil, has taken a lead in mentoring minority-owners of Puget Sound-area architecture and engineering companies. “I met my personal goal, to run a successful firm, and now I want to give back,” says Castro, who works with the state’s Department of Enterprise Services to collaborate with

doctorate in microbiology, genetics and cell biology, or biochemistry and biophysics, with any of the professors in any of those programs. I was also impressed with the structure of the program. I felt very comfortable that I would know exactly what my path was.

How did WSU prepare you for your career? WSU’s graduate program showed me how to do the basic research well, and the National Institute of Health Protein Biotechnology Training Program showed me what I would take to get the basic science to the FDA and the path to develop a future drug, an experience that was crucial in landing my job at Fred Hutchinson. I loved the basic science exposure I got, but my enthusiasm came from doing science to change the way we treat diseases so we could rewrite the playbook for physicians. I was never embarrassed by enthusiasm, and those at WSU never made me feel like that was something unacceptable in the field. I had big dreams when I came to WSU. The training program put me in a position to see those dreams to their current reality.

What advice would you give students about to embark on a graduate degree? Remember that great success primarily comes from failures, not by getting it right all the time. Take each failure as another step forward on the path to realizing a great advancement. Never feel like you already know it all. It’s great to be confident, but it’s good to be open to learning new things. When you’re humble and open your self-esteem, it minimizes failures.

A long-time motorcycle enthusiast, Castro enjoys planning long rides. He recently rode from Tijuana through Baja California with his sons, Lucas and Pete, a videographer who documented the adventure in a YouTube series. Castro’s latest motorcycle trip—from Rio De Janeiro through Patagonia—was threatened due to the pandemic. But, in 2008, he rode some 6,000 miles roundtrip from Redmond to Alaska and, in 2013, he rode from Redmond to Rio.

That same year, Magellan was named one of the fastest-growing minority-owned businesses in Washington by the Puget Sound Audacious Minority Business Journal. The firm opened an office in California in 2011, another in Dallas, Texas, in 2017, and another in Rio De Janeiro in 2019. Castro is actively looking for more.

When architects join what he calls “the Magellan family,” the office handles billing and other chores “architects hate.” They share personnel and marketing to minimize the “hire and fire” cycle that can happen with market fluctuations. Castro is co-owner of the new offices, and principal buys shares so that they can eventually become full owners.

“Transferring to the roles of coach and consultant,” says Castro, noting he’s open as many new offices as he can. “If good people have good mentorship, it minimizes failures.”

With the unwavering support of its members, the WSUAA has achieved its goal of reaching 40,000 members of the WSU Alumni Association by 2020.

Back in 2003, the WSUAA had only 13,000 members. WSU needed more Cougs to be engaged with the University, so the WSUAA set its sights on doubling its number of members. This was an enormous undertaking, one that some people thought was crazy. However, the WSUAA knew that if the Cougs would respond, and they did. In 2012, the WSUAA exceeded 26,000 members.

As the WSU system grew, so did its need for alumni support. If the WSUAA was able to double membership, why not try to triple it?

In 2018, the WSUAA launched its “40 by ’20” membership drive. Once again, the Cougar family joined in the effort. Along the way, member support propelled the WSUAA to be ranked among the top alumni associations in the world.

Cougs banded together to support WSU. All have different WSU experiences. They live on both sides of the Cascades, across the country and around the globe. They may have attended WSU at different times or on different campuses or online. But they all share one thing in common: they all love WSU.

As WSU deals with the impact of COVID-19, it needs alumni support now more than ever. The WSUAA is confident that each member—all 40,000—will find a way to give back to WSU and help the University get through today’s challenges.

WSU will emerge stronger and even more focused on meeting the needs of its state, nation, and world. This challenge is too big, and no one too good for Cougs. The WSUAA knows that members will be there for WSU just as they were there to help the WSUAA reach 40,000 members by 2020.

Alumni Association News

40 by ’20

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New Media

Saving the Oregon Trail: Ezra Meeker’s Last Grand Adventure
Dennis M. Larsen ’86 Poli. Sci.
WSU Press: 2020

Ezra Meeker went back the way he came in an ox-drawn covered wagon. He was a man on a mission, and no one and nothing—not his wife nor his children, and certainly not a lack of funds—could stop him. He was stubborn, resilient, resourceful, restless, and he had lots to do.

The president and a charter member of the Washington State Historical Society, first mayor of Puyallup, and one-time “Hop of the Washington State Historical Society, Meeker provided a fascinating look at the schemer, dreamer, and doer, a lack of funds and fighting her own battles.

Do No Harm
James B. Cohoon
76 BiOL
Point Sea Press: 2020

Matthew Preston is just a kid when his father is shot and killed while surprising a burglar in their home in the tony West Los Angeles enclave of Pacific Palisades. The culprit, Ted Nash, is the twentysomething ne’er-do-well son of do-to-do neighbors: a distant, workaholic father and doting, clueless mother. He’s sentenced to life in San Quentin State Prison. But that’s not enough for Matthew, who obsesses over avenging his father’s murder.

Matthew is a straight-A student and standout athlete who attends the Stanford University Medical School with the nascarius plan of becoming a prison doctor in order to gain access to Nash. While Matthew’s hitting the books in medical school, the killer’s family files a petition to have him released, and Matthew hastens his scheme to exact revenge.

By now, he’s fallen for his study partner, the plucky and whip-smart Torrey Jamison, who did not enjoy the same kind of affluent upbringing. She’s at Stanford on a full scholarship—and fighting her own troubled past.

Both take the Hippocratic Oath in a White Coat Ceremony at the beginning of medical school. And the big question throughout this suspense-filled story: will one of them break it before they graduate?

Cohoon spent more than thirty years as a civil litigation lawyer and served as president of an ABA-based firm until his retirement in 2014. He and his wife Rozanne Cohoon (’76 Biol) have two children: a track-star daughter who went to Stanford and worked as a lawyer, and a son who practices medicine in southern California.

—Adriana Fanovich

BrieLy NoTed
The IDS Reader: Milestone Texts of the Islamic State Movement
HarbO r J. Ingram, Charlie Winter, and Carl Hume
34th Poli. Sci.
Oxford University Press: 2020

This scholarly compendium examines key milestones and messages of the Islamic State movement without sensationalizing or merely recounting them. It’s a timely and thorough guide for those seeking to better understand the development and dynamics of ISIS. Creator Craig Whitnall, associate professor of international security affairs at the U.S. Naval War College in Monterey, California, and his collaborators contextualize the movement’s evolution, analyzing its vision and strategies on propaganda, governance, and warfare.

Whitnall wrote his doctoral thesis on the political worldview and strategy of Iraq’s Islamic State, focusing on the decade from 2003 to 2013. He’s a retired lieutenant colonel of the U.S. Army and graduate of the U.S. Military Academy at West Point. His areas of expertise include counterterrorism, information operations, and irregular warfare.

Triptych
Marcia WhiNey-Schenck
73 Comm.

Set over six centuries, this three-part historical narrative traces the journey of a mysterious Black Madonna, carved in France in 1365. The statue plays a pivotal role in the lives of a Spanish nun and apartment during the Spanish Inquisition in 1492 and a Belgian laverokker, who loses her ability to speak as the result of a vicious attack in 1914. Whitney-Schenck, a Chicago-based artist, writer, and performer, is the former editor and publisher of Christianity and the Arts magazine and a former reporter for the Tacoma News Tribune. This is her first novel.

She is also the author of Camping Stories: A Spiritual Journey on El Camino, featuring 33 meditations she wrote while walking the famed path to Santiago de Compostela, Spain.

Oklahoma Rodeo Women
TrACeY haNshew
Aarcadia Publishing and the History Press: 2020

Tracey Hanshew, a clinical assistant professor at Washington State University Tri-Cities, follows the trail that Oklahoma women have blazed across the rugged world of rodeos, including riding the same bronzes as men, breaking records, training riders for Hollywood, and fighting to regain a foothold in the sport after being shut out following World War II.

Butch T. Cougar: Mascot or Superhero?
CaRyn laWtOn
WSU Press: 2019

Secret identity? Check. Cool costume? Check. Never grown old? Check. What more evidence do you need? This whimsical, slim paperback offers these considerations and more to help young and old Cougar fans decide for themselves. Originally created for a fundraiser, the hand-illustrated picture book was so popular that WSU Press decided to release it as a regular title. Lauton, whose areas of expertise include counterterrorism, information operations, and irregular warfare, writes and illustrated the book, is the marketing manager for WSU Press.

Rolyed Gratitude: Waiting Until the Fur Flies Your Way, a Mascot Memoir
David Stoddell ’98 EliaM.
and sec. ed.
Warren Publishing: 2018

After portraying Butch T. Cougar at WSU, David Stoddell went on to become a professional mascot for teams in the NFL, MLB, and more. In this fast and fun read, he gives a behind-the-scenes look into one of the most visible, and yet anonymous, roles on the field or court.

RoRoD: To War in a Rubber Duck
Rodger Pettichord ’65, 67 MA
English
Gray Dog Press: 2019

This triology about American B-52 pilots during and after World War II follows them from their beginnings with the British before the United States officially entered the war, to flying covert missions in the Cold War. ROYOD stands for Reconnaissance, Observation, Opposition Resources, Destruction. American pilots dubbed it The Royal Order of Rubber Ducks.

Retired Presbyterian minister Rodger Pettichord wrote the novels with retired U.S. Army warrant officer Jim Rubin and retired military and aviation pilot David Ward.
DON WELLER (’60 Fine Arts) won the Western Heritage Award for Literature for Don Weller: A Visual Memoir. The book includes paintings, short stories, and essays of Weller’s early career in illustration and design in Los Angeles as well as paintings of cutting-horse and ranch adventures in Texas and Utah.

JOHN THORESEN (’82 Bus.), CEO of the Barbara Sears Children’s Center Foundation, was honored by DSO Today Magazine as one of the global healthcare leaders in its 2020 Healthcare Innovators issue. AMEREAU, JIM ANDERSON (’74 Env. Sci., ’78 M.S Env. Sci.) was recently appointed to the Washington State Fish and Wildlife Commission. He returned from the Northwest Indian Fisheries Commission in 2010, where he served as executive director for 20 years. He lives in Buckley with his wife, DIANNE MESERVE (’77 Env. Sci.).

LINDA ADAMS ON BARTA (’76 Comm.) retired from the Wenatchee World after 42 years as an editorial assistant, local history columnist, and editor of the Douglas County Empire Press. JO ANN WAGGSTAFF (’77 Phys. Ed.) received the Distinguished Service Award from the athletic Northwest Conference. Wagstaff served at Whitworth University in 1984 as the women’s tennis coach. She stepped down in 2015 after helping the Pirates to three national championships. She was National Association of Intercollegiate Athletics District 1 Coach of the Year in 1987, and, in 2013, she and her husband, Mike, also longtime tennis coach, were jointly honored by the Inland Empire Sportswriters Hall of Fame.

TURNER women’s administrator, associate director of athletics and senior broadcasters with a 25-Year Award. BILL, also a longtime tennis coach, were jointly honored by the Inland Empire Sportswriters Hall of Fame. The 93rd annual Western Choral Directors Association. The exchange allowed fellows to travel to South Africa for an interchange of music, culture, and pedagogy. JEFF MOSES (’92 Arch. and Arch. Studies) is an architect and project manager at Architects West and 2020 ALA Spokane president. STEPHANIE ROHMAN (’89 Bus. Admin. and Finance) is head of innovation at Catalyst Housing.
Group in California. **VINCENT JUNIO** (’95 B.S., ’99 M.S. Health & Admis.) is interim chancellor at South Louisiana Community College. **Davidson hotels and resorts** (’81 B.S., ’83 M.S.) is president and CEO of WordMatter. **ALI BOUAMOUCHE** (’96 M.S. Civ. Eng.) is vice president of talent and culture. Previs oversees all talent acquisition, training, and development across branded hotels, Point Hotels & Resorts, and the Davidson Restaurant Group.

**ASHLEY WATUCHOCH** (’04 Comm.) in the 2019-20 Red River Athletic Conference Athletic Director of the Year. Wathutoch has served as executive director of Athletics at University of Houston-Victoria (Texas) athletics in 2006. He has expanded the Jaguar program from two to six sports and 50 to 140 student-athletes. At WU, he founded, played for, and coached the hockey club. **DARKY WOLFE** (’74 Soc. Sc.) is the chief executive officer of Olympic Medical Center (OAC). Wolfe oversees a $223 million operations budget and nearly 1,600 employees. He joined OMC in 2006 as a financial analyst and progressed into leadership roles, including treasurer, director of administration, and chief financial officer.

Columbia City School District Ohio had hired **DIONNE A. BLUE** (’95 B.A., ’96 M.S. Educ.) as its first-ever chief equity officer. Blue had been serving as chief diversity officer for the Evanston Township High School Corporation, where she was responsible for creating and implementing a comprehensive plan for diversity, equity, and inclusion at the third largest school district in Indiana. **Miller Naz Graham & Dunn attorneys AMY ROBINSON** (’95 Pol. Sc.) recently approached board chair of the Washington State University-Vanguard Advisory Board for WSU’s Canisius College of Business. Robinson represents public and private employers throughout the Pacific Northwest.

**TAMMY H. MOORE** (’70, ’’83 M.S. Nursing) is the new chief operating officer at Cancer Island Medical Center on Santa Catalina Island, California. She comes to the role from Summit Pacific Medical Center in Elma, where she served as chief clinical officer.

**EVERYMIND** (’26 Acc.) has been promoted to senior accountant at Ackerman. **ERIN QUANN** (’01 M.S. Nursing) is the director of public health for Kitsap County. As a member of the County’s COVID-19 response team, she was recently deployed to San Antonio, Texas, to assist with operations and contact tracing.

**MIKE BERTRAND** (’22 Comm.), a foreign service officer for the Department of State, has arrived at the U.S. Embassy in Islamabad, Pakistan, to work on environmental, science, technology, and health issues. His prior post was in Tegucigalpa, Honduras, where he worked in consular affairs.


**KERRI A. W. BRADY** (’89 B.S. Ed., ’13 M.A. Ed.) has been promoted to senior accountant at Ackerman.

**ANGIE KARDEL** (’97 M.A. Admis.) has joined The Russell and Sheri Crawford Legacy Scholarship in Pharmacy and Pharmaceutical Sciences.

**RYAN McDERMOTT** (’00 B.A., ’12 J.D.) has joined the law firm of Noongood & Winter in Seattle. Mcdermott represents public and private employers throughout the Pacific Northwest.

**MELISSA J. GASKELL** (’77 B.S., ’80 M.S. Publ. Health) is a geriatric research nurse at the UW School of Nursing.

**KENDRA WIGDER** (’10 Acc.) has been promoted to senior accountant at Ackerman. **MIRANDA ELIZABETH** (’11 M.A. Acc.) has joined Opalism Dawson.

**BRAD BUPP** (’18 M.B.A.) is the managing director of the firm. Bupp has 20 years of experience in water systems and environmental permitting. **ALICIA LEE** has joined Bupp as director of operations. Bupp represents public and private employers throughout the Pacific Northwest.

**LAURA WEST** (’94 Comm.) is the 2019-20 Elementary School. West, the federally designated organ donor of organ operations at Donor Network Northwest, has been managing work with UWM on the Seattle area to light up a new junior high school. West has been promoted to senior accountant at Ackerman. **JONATHAN M. BAYLEY** (’05 M.B.A.) has joined the firm.

The Russell and Sheri Crawford Legacy Scholarship in Pharmacy and Pharmaceutical Sciences was established with a major gift from Rusty, class of 1987, and Sheri, class of 1988, who felt compelled to honor their ties to WSU and their careers in pharmacy. They hope their investment in our student pharmacists encourages other alumni to become donors to the College of Pharmacy and Pharmaceutical Sciences.

Thank you to Sherry and Rusty!
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SINCE 1890, WASHINGTON STATE UNIVERSITY has been committed to providing students from all walks of life the opportunity to become more aware, engaged, creative, and socially mobile.

More than 50 years ago, Roscoe and Frances Cox recognized the impact that a land-grant college education could have on the next generation, and included the WSU Foundation as a beneficiary of their wills.

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Use the attached form, or call 509-335-7883 to learn how you, like Roscoe and Frances, can make an impact.

"This scholarship serves as more than just financial relief, it provides community. The support I receive pushes me to continue to learn more in a fascinating field of study."
- Katherine Naasko '22

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Matthew Brooke ’24
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Marina de la Cruz ’22
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"This scholarship serves as more than just financial relief, it provides community. The support I receive pushes me to continue to learn more in a fascinating field of study."

- Katherine Naasko ‘22

"Our education is a gift that we can give to others. It is a gift that makes the world a better place.

- Katherine Naasko ‘22

"The Roscoe and Frances Cox Scholarship is a testament to the importance of providing opportunities for all students to succeed at WSU.

- Katherine Naasko ‘22

"This scholarship has been a huge help for me financially and I am very grateful to have the opportunity to attend WSU.

- Katherine Naasko ‘22

"The Roscoe and Frances Cox Scholarship is a testament to the importance of providing opportunities for all students to succeed at WSU.

- Katherine Naasko ‘22

The Cox Family Legacy

The mice will play

Glacier mice could be something from a fairytale— mossy little puffballs filled with tiny fanciful creatures.

“They are adorable—they really do look like little rodents,” says glacier biologist Scott Hotaling, a postdoctoral research associate at Washington State University. Hotaling studies organisms that live in the world’s coldest locations such as the ice sheets in Alaska and Iceland where these glacier moss balls are found.

Last April, his research with University of Idaho scientists Tim Bartholomaus and Sophie Gilbert was highlighted in the journal Polar Biology. Hotaling says studying moss balls helps scientists better understand the fragile glacier ecosystems that are disappearing due to climate change.

Glacier mice—squishy clumps of moss that form around a pebble or other glacial debris—were first reported by an Icelandic scientist in 1951. They appeared to live in colonies that mysteriously migrate around the glacier.

Hotaling says they now know glacier mice move by insulating the ice below them, which melts during summer except for a little pedestal under the moss ball. Once that pedestal gets too thin, the ball falls off and rolls.

“For this study, we wanted to determine how fast they move and in what direction,” he says.

Tracking moss balls on an Alaskan glacier, the researchers discovered the small pillows can move up to several centimeters per day—sometimes south, sometimes west but always as a choreographed herd.

Hotaling says they don’t yet know why their movements are so synchronous.

They do know the moss balls provide homes and transportation for a thriving invertebrate community which includes shrimp-like springtails and chubby tardigrades, also known as water bears or moss piglets.

“The moss balls create islands on the glacier that buffer the environment and protect these organisms from the extreme effects of cold and UV light,” Hotaling says. “We’ve shown that since these islands mature, they can live about six years. That’s a long life for a little puff of moss.”
Due to budget cuts, the Spring 2021 issue of Washington State Magazine will be online only.
The issue will launch on February 1, 2021. To read the magazine:
- All stories, videos, photo galleries, and more available at magazine.wsu.edu
- Print-on-demand and PDF versions of the magazine on the website
- Connect with us on social media and sign up for our monthly email newsletter: magazine.wsu.edu/connect

The Summer 2021 issue will also have limited distribution. To receive your copy, join the WSU Alumni Association, if you haven’t already. You can also pay for a subscription.

Contact us: magazine.wsu.edu/contact

You can help. See the inside back cover for ways to keep WSU stories coming to your mailbox.